PUBLISHERS OF LAW BOOKS
PRINTERS AND BOOKBINDERS
The Carswell Company
LIMITED
145-149 ADELAIDE STREET WEST
TORONTO CANADA

Digitized by the Internet Archive
in 2014

https://archive.org/details/contractrecordv24p02

Vol. 24 Toronto, July 6, 1910 No. 27

ESTABLISHED 1886

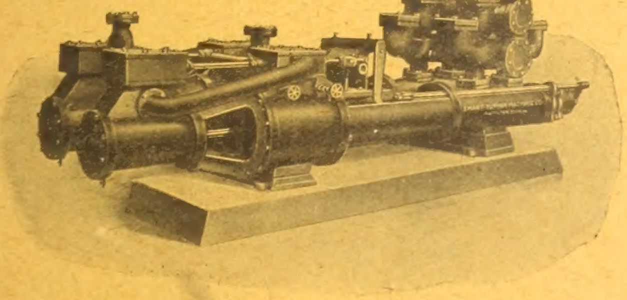
Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

If You are in the Market for any

Power or Steam Pumps, Condensers, Engines, Boilers, Travelling Cranes, etc.

Drop Us a Line. Write for our Catalogue.



The Smart-Turner Machine Company Limited
HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

We Also Handle

Bar Steel

Iron Finish Smooth Finish
Reeled

Lowest prices for satisfactory qualities

A. C. Leslie & Co., Limited
Montreal
Canadian Sales Agents

Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

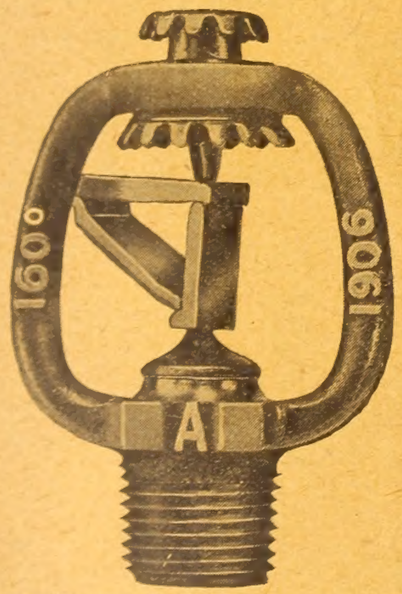
Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited
General Office: Sherbrooke, Que.
Works: Sherbrooke, Que. St. Catharines, Ont.
Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

$20,000,000.00!



The "Rockwood" Approved by all Canadian and American Insurance Associations

Canada's Annual Fire Loss.
What Proportion Do You Pay?

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums
For particulars and free estimates communicate with

The Rockwood Sprinkler Co., of Canada, Limited, Montreal

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Automatic Sprinklers Page
Rockwood Sprinkler Co. 2

Architectural Iron Work
Canada Wire Goods Mfg. Co. 57
Dennis Wire & Iron Works 62

Boilers
Inglis, John 24
Jenckes Machine Co. 2
Marsh & Henthorn 53
McDougall Caledonian Iron Works 36
Mussens Limited 34
Taylor-Forbes Co ....
Waterous Engine Works Co. 33

Brick
American Enamelled Brick Co. 56
Canadian Pressed Brick Co. 16
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co. 16
Port Credit Pressed Brick Co. 16
Toronto Pressed Brick Co. 21

Bridges (Steel)
Canadian Bridge Co. 58
Cleveland Bridge Co. 58
Dickson Bridge Works ....
Dominion Bridge Co. 58
Phoenix Bridge and Iron Works 59
Pennsylvania Steel Co. 58

Builders' Hardware
aylor-Forbes Co. ....

Cement
Alsen Portland Cement Co. 56
Britnell & Co 62
Bremner, Alex 61
Canada Cement Co 3
McNally & Co., W. 63
Morrison & Co., T. A. 64
Rogers, Alfred 4
Rogers Supply Co. 33
Sand and Supplies 63
Stinson-Reeb Builders Supply Co. 62

Conduits Page
Conduits Co., Limited 62

Concrete Mixers and Machinery
Canada Foundry Co. 14
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F., H 68
Jenckes Machine Co. 2
London Concrete Machinery Co. 23
Mussens Limited 34
Morrison & Co., T. A. 64
Rogers Supply Co. 33

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 65
Buffalo Steel Co. 59
Canada Wire Goods Mfg. Co. 57
Hamilton Iron & Steel Co. 36
Ontario Iron & Steel Co. 5
Trussed Concrete Steel Co. 63

Contractors' Plant
Beatty & Sons, M. 59
Hepburn, John T. 17
H. & E. Lifting Jack Co. 59
Hopkins & Co., F. H. 68
Katie Foundry Co. 64
Marsh & Henthorn 54
Mussens Limited 34

Crushers (Stone and Rock)
Hopkins & Co., F. H. 68
Jenckes Machine Co. 2
Mussens Limited 34
Morrison & Co., T. A. 64

Corrugated Iron
Galt Art Metal Co. 20
Metallic Roofing Co. 55
Metal Shingle and Siding Co. ....
Ormsby, A. B., Limited 5
Roofers Supply Co. 54

Contractors Page
McIlwraith, Jas. A. 64

Drills
Beatty & Sons, M 59
Canadian Rand Co. 1

Drilling Contractors
Harvey, J. 65

Dredges
Beatty & Sons, M 59

Engines
Inglis, John 24
Jenckes Machine Co. 2
Mussens Limited 34
Waterous Engine Works Co. 33

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co. ....

Engineers (Civil and Mechanical
Barber & Young 64
Chipman, Willis 64
Bowman & Connor 64
Davis & Johnston 64
Farmer, John T. 64
Fuce, Edw. O. 64
Galt & Smith 64
Hunt & Co., Robt. W. 63
Inglis, John 24
Leofred, A. 64
Lea & Coffin 64
Mitchell, C. H. 64
McRae, John B. 64
Moore & Scollon 64

Fire Apparatus Pag
Morrison & Co., T. A. 66
Seagrave, W. E. 62

Fireproof Doors and Windows
Douglas Bros. 67
Mussens Limited 34
Ormsby, A. B. 5

Granite and Marble
Laurentian Granite Co. 64
Missisquoi Marble Co. 15
Rogers Supply Co. 33
Smith Marble & Construction Co. .. 22

Glass
Chance Brothers & Co. ....
Consolidated Plate Glass Co. ....
Luxfer Prism Co. ....
Thompson & Co., B. & S. H. ....
Toronto Plate Glass Importing Co. .. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 53
Taylor-Forbes Co. ....

Hoisting Machinery
Beatty & Sons, M. 59
Inglis, John 24
Jenckes Machine Co. 2
Hopkins & Co., F. H. 68
Marsh & Henthorn 53
Mussens Limited 34
Scott Machine Co. 5

Hydrants
Canada Iron Corporation 61
Gartshore-Thompson Pipe Co. 60
Kerr Engine Co. 8

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co. 59

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

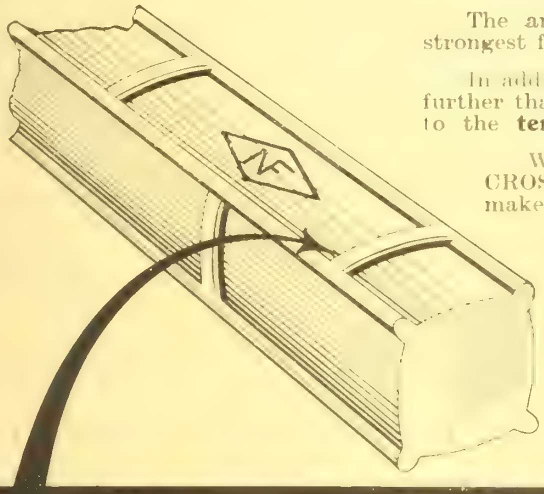
ALFRED ROGERS

General Sales Offices:
PHONE MAIN 4345 306-307 Stair Building, TORONTO

It Adds to Strength and Lessens Strain

Here is a cut of a section of the

"NF" Reinforcing Bar for Concrete



The arrow points out the **longitudinal rib** which is one of its very strongest features.

In addition to the usual advantages claimed for deformed bars, we claim further that the **longitudinal ribs** on the four corners of the (NF) Bar add to the **tensile strength** and prevent **torsional strains** in the concrete.

We have proven this to be an established FACT. In addition the CROSS RIBS form a mechanical bond, so that less metal is required to make a PROVEN BOND under OURS than under any other system.

Does this mean anything else than a SAVING in COST, not only in the **first instance** but so long as the **building will stand?** Is it possible to figure the case out in any other way?

We should like to send you some literature on this point, may we?

ONTARIO IRON & STEEL CO LIMITED TORONTO CAN.

It is the Best Fire Door Hanger Ever Devised

Our **ADJUSTABLE HANGERS** have both **Vertical** and **Lateral** adjustments **and cannot jump the track.** The adjustments permit the doors to be hung close against the wall and tight to the floor. They permit the doors to be adjusted to conform to varying conditions resulting in the doors being kept in **perfect condition without any expense for repairs.** Made in different sizes to suit size of doors.

Specify the **ORMSBY "UNDERWRITERS" FIREPROOF DOORS** fitted with **Adjustable Hangers**

Manufactured by

A. B. ORMSBY, Limited

Factories

TORONTO and WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :

Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	55
[illegible] Lumber Co	
[illegible] Ltd	[illegible]
Eaton & Sons, J. R	[illegible]
Georgian Bay Shook Mills	[illegible]
[illegible] Furniture Co	[illegible]
Rhodes Curry & Co	
Sanitary Floor Co	57
[illegible] Bros	[illegible]
Standard Mills Limited	[illegible]
Woodstock Lumber Co	66

Metal Lath

Galt Art Metal Co	20
Metallic Roofing Co	55
Noble C. W	20

Meters

Hopkins & Co., F. H	68
Neptune Meter Co	1

Paving and Paving Materials

Dominion Carbolineum Works	13
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co	66
Silica Barytic Stone Co., of Ontario	65

Plaster

Albert Mfg. Co.	
Britnell & Co	62

Pipe

Canadian Pipe Co	66
Dominion Wood Pipe Co	9
Gartshore-Thomson Pipe Co.	60
Municipal Construction Co.	17
National Iron Works	61
Pacific Coast Pipe Co.	1
Pedlar People	21

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel	61
Glidden Varnish Co	
International Varnish Co.	60
Paterson Mfg. Co.	12

Pile Driving

	Page
Lincoln Construction Co.	62

Pumps and Pumping Machinery

Beatty & Sons, M.	10
Goulds Pump Co	
Hopkins & Co., F. H.	68
Inglis Co., John.	24
Martin Steam Pump Co.	55
McDougall Caledonian Iron Works, John	36
Mussens Limited	34
Ontario Wind Engine & Pump Co.	59
Smart Turner Machine Co.	1
Waterous Engine Works Co.	22

Roofing Materials

Barrett Mfg. Co.	12
Brantford Roofing Co	11
Galt Art Metal Co.	20
Metallic Roofing Co.	55
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	33
Roofers Supply Co	53

Railway Supplies

Gartshore, John J.	64
Hopkins & Co., F. H.	68
Mussens Limited.	34

Road Machinery

American Road Machinery Co.	14
Case Threshing Machine Co.	53
Climax Road Machine Co.	60
Morrison & Co., T. A.	64
Mussens Limited.	34

Sewer Pipe

American Sewer Pipe Co.	18
Britnell & Co	62
Canada Iron Corporation.	19
Dominion Sewer Pipe Co.	18
Gartshore-Thomson Pipe Co.	18
Hamilton & Toronto Sewer Pipe Co.	19
National Iron Works	61
Ontario Sewer Pipe Co.	10
Rogers Supply Co.	33
Standard Drain Pipe Co.	18
Toronto Pottery Co	18

Sand

Rogers Supply Co.	33
Sand & Supplies	63

Stone

	Page
Britnell & Co.	58
Christie, Henderson & Co.	17
Consolidated Stone Co.	20
Contractors' Supply Co.	56
Corinthian Stone Co.	63
Crushed Stone, Limited.	57
Doolittle & Wilcox.	61
Hagersville Contracting Co.	5
Laurentian Granite Co.	64
Maloney John.	63
Morrison & Co., T. A.	64
Myers, Oakley.	57
Robertson, D	57
Rogers Supply Co.	33
Roman Stone Co	17
Sackville Freestone Co.	57
Sand and Supplies.	63
Wiarton Stone Quarry.	63

Structural Iron and Steel

Buffalo Steel Co.	
Corbet Foundry & Machine Co.	59
Dominion Bridge Co.	58
Hamilton Iron & Steel Co.	36
MacKinnon Holmes & Co.	51
Pennsylvania Steel Co.	58
Phoenix Bridge & Iron Works.	59
Queen City Foundry Co.	64
Reid & Brown.	64

Shovels (Steam)

Beatty & Sons, M.	59
Hopkins & Co., F. H.	68
Mussens Limited.	34

Street Sprinklers

Heaman, Geo.	61

Slate

Roofers Supply Co.	56

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Safes and Vaults

Taylor, J & J	

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	22

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Marsh & Henthorn.	53
McDougall Caledonian Iron Works.	36
Ontario Wind Engine & Pump Co.	59

Typewriters

United Typewriter Co.	66

Valves

Canada Iron Corporation.	61
Gartshore-Thomson Pipe Co.	60
Kerr Engine Co.	8
Standard Fitting & Valve Co	67

Ventilating System

Gardiner & Gaskill.	57

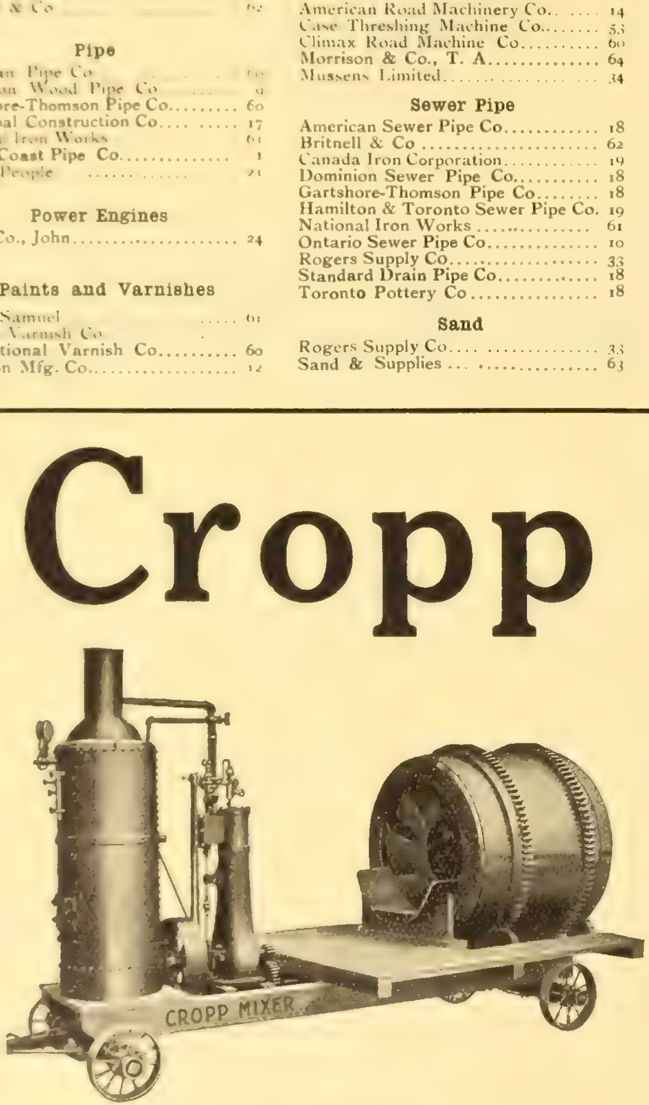
Wire Rope

Dominion Wire Rope Co.	68
Greening Wire Co., B.	66
Smith, Thos. & Wm.	

Wire Fences and Screens

Canada Wire Goods Mfg. Co.	57

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street,
Chicago, Ill., U. S. A.

Don Valley Bricks

are made in every imaginable style, and shape. Any color scheme or design may be effectively worked out with our bricks.

The following is a partial list of our products :

BRICKS

- Pressed Bricks (over 130 different shapes)
  Red, Buff, Brown, Old Gold, Olive Green, etc.
- Enamelled (over 20 colors)
- Vitrified
- Porous Terra Cotta
- Wire-cut
- Velvet Finish
- Clinker, etc.

FIREPROOFING

- Column Covering (Square or Circular)
- Arches
- Blocks (eight stock Sizes)
- Furring
- Flooring
- etc.

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent : **David McGill, 206 Merchants Bank Chambers**

Satisfaction With

KERR VALVES

We have been making "KERR" valves and hydrants for a long time and know what a good valve is.

The many cities and towns throughout the Dominion that have used our goods say they are very satisfactory.

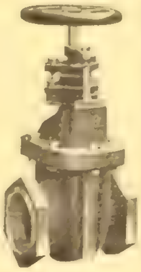
If your town or city intend making extensions or installing a new system of waterworks it will pay you to specify "KERR" goods.

Their value has been proved by long and satisfactory service.

IRON

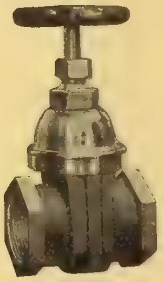
BODY

GATE



VALVES

Compression Hydrant



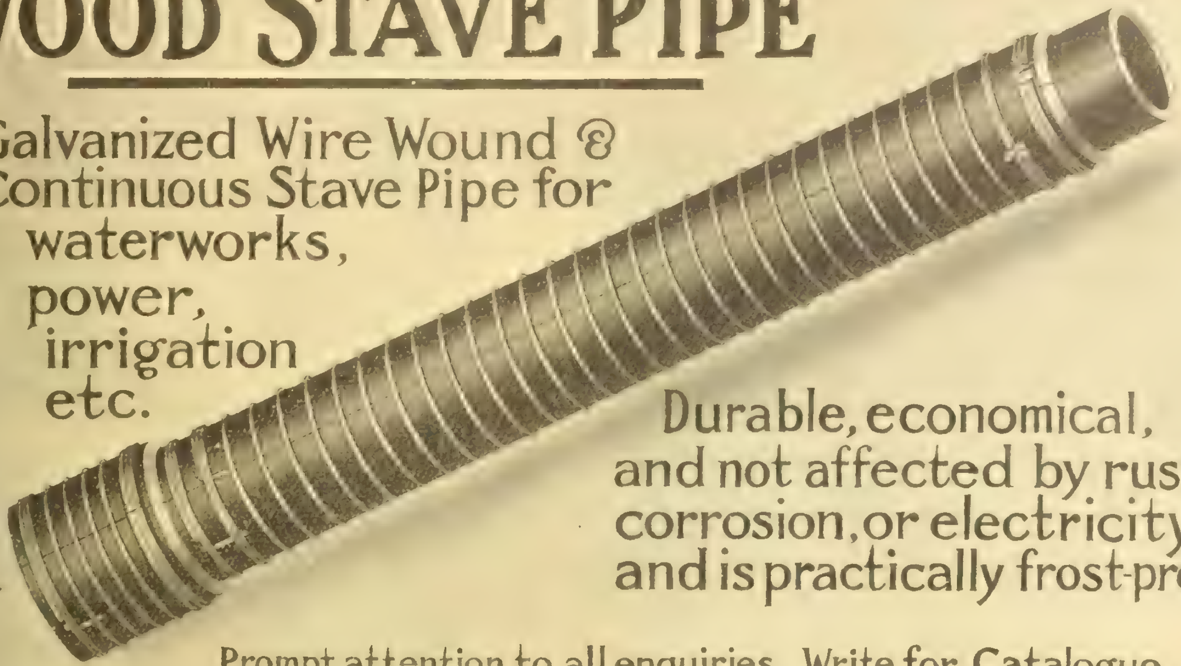
Webber Gate (Brass)

Hub End Gate

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**

When You Want Good Sewer Pipe

Don't forget that there is one place where you will be sure of the **best** article and the very best treatment.

Drop a line to

THE ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

"MIMICO" Pipe Makes the Sewer Sure

"Brantford Specification" is now the choice of many builders and contractors

Easily and quickly laid

For stores, factories, and other buildings with flat roofs, Brantford Specification is particularly suitable. It makes a durable, lasting roof-protection at the minimum of expense.

Either Brantford ASPHALT Roofing or Brantford RUBBER Roofing is used for Brantford Specification. It is laid double, with Branroco Cement between laps. The nails are two to three inches apart and all nail heads are covered. By following our instructions for laying, the job can be easily and quickly done, and the roof made absolutely waterproof.

No coal tar is used for Brantford Specification. Coal tar gets soft and melts in summer, and becomes brittle and cracks in winter. Our saturation is 99 per cent. pure Asphalt. Asphalt of this quality and purity does not melt in summer nor crack in winter. It is the most durable saturation known.

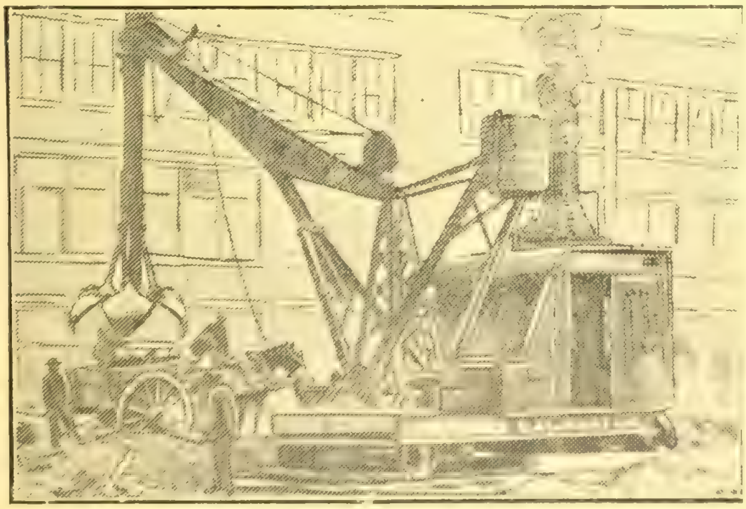
The material for Brantford Specification retails from $5.00 to $7.50 per square, according to the thickness of the roofing. Brantford ASPHALT and Brantford RUBBER Roofing are both made in 1, 2 and 3 ply.

Further information about Brantford Specification will be promptly furnished on request.

Brantford Roofing Company, Limited
Brantford, Canada
AGENTS: The General Supply Co., of Canada, Cor. Market and Louise Sts., Winnipeg, Man. 356-360 Sparks St., Ottawa

The Advantage of the

J. W. Harris Excavator



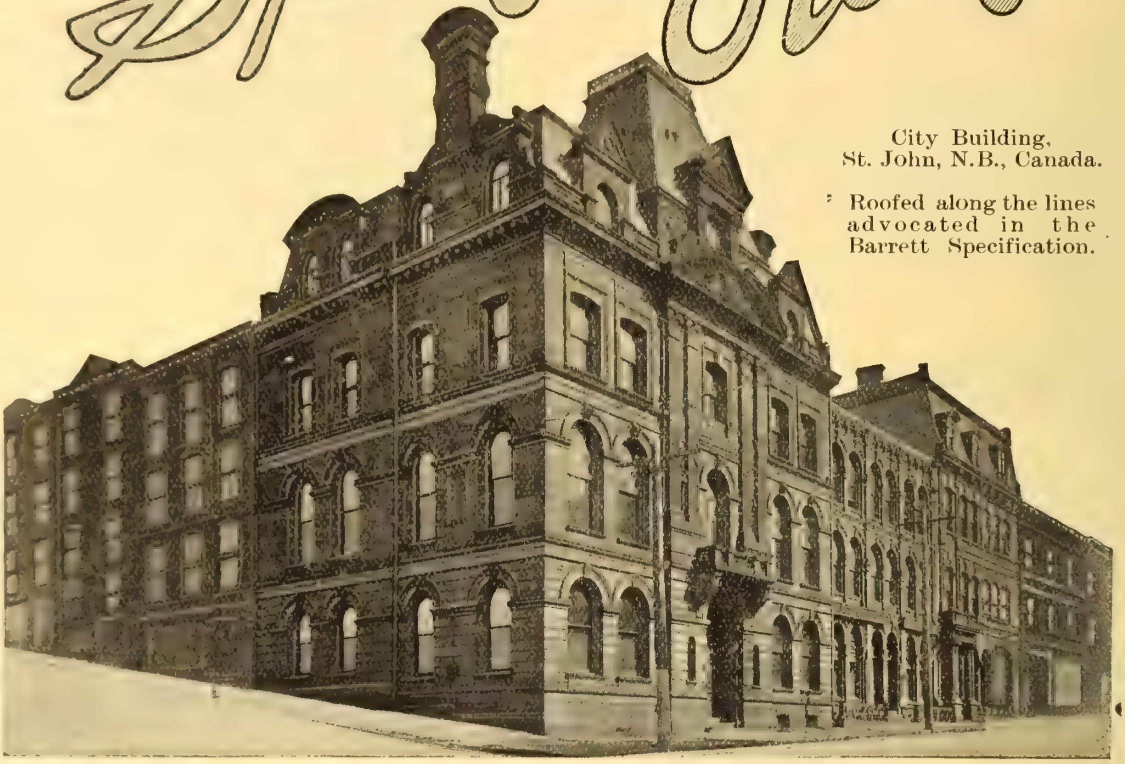
is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

J. W. Harris Mfg. Company, Ltd.
MONTREAL

Barrett Specification Roofs



City Building,
St. John, N.B., Canada.

Roofed along the lines advocated in the Barrett Specification.

After Twenty-Seven Years of Service

THE roof of this structure was laid in 1882. A letter recently received from the contractors states that it is still in good order *after 27 years of service.*

As compared with other kinds of roofing, and considering the wide variation of temperature in New Brunswick, this is an astonishing record. It emphasizes the satisfactory results which Barrett Specification Roofs invariably give.

The architect or owner of a building who will order his roofing laid "according to The Barrett Specification" and *insist that the Specification be followed to the letter,* is absolutely assured of *satisfactory service.*

It is well to remember that with Barrett Specification Roofs there is no maintenance expense whatever. Metal and Ready Roofings *require paint and attention every few years* to insure freedom from leaks and trouble.

Every architect, engineer and owner should have the Barrett Specification on file. We will send same promptly to anyone interested on request to our nearest office.

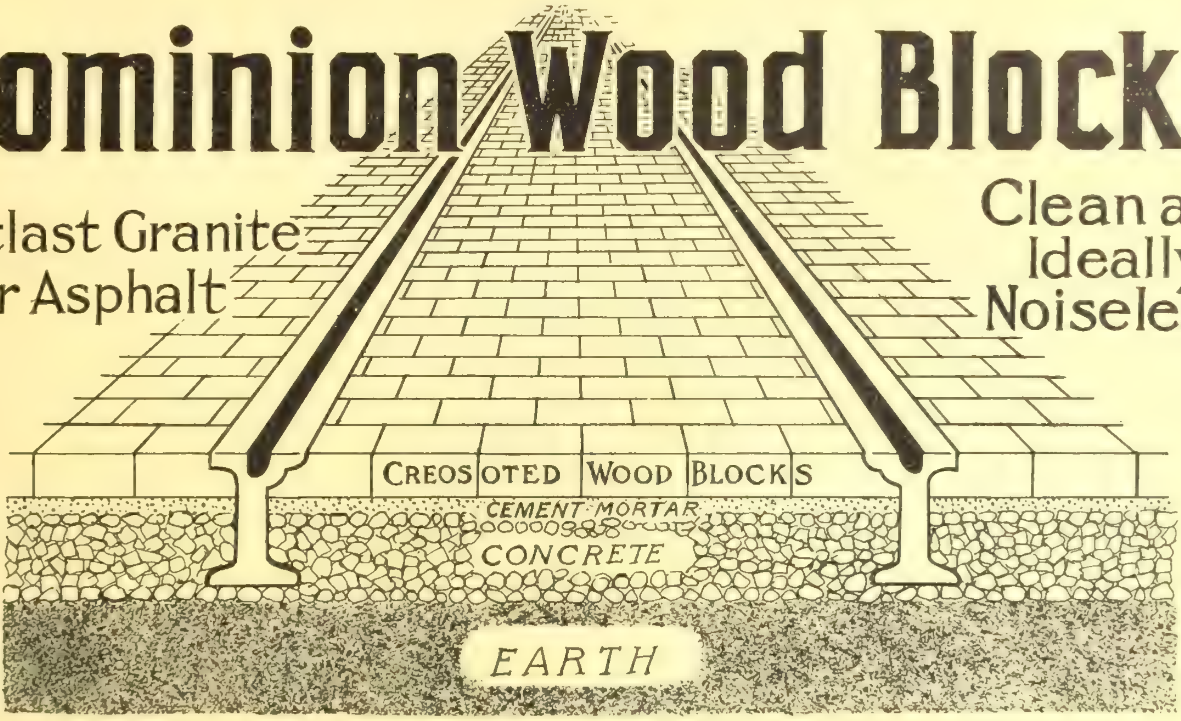
The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Most Durable Pavement in the World

Dominion Creosoted Wood Paving Blocks make the best pavement for all classes of service. It is the one pavement that won't need the annual attention of the repair gang.

Dominion Blocks are made of Douglas Fir, the best timber for this purpose that is grown under the sun. Only live logs are used thus ensuring a perfect block.

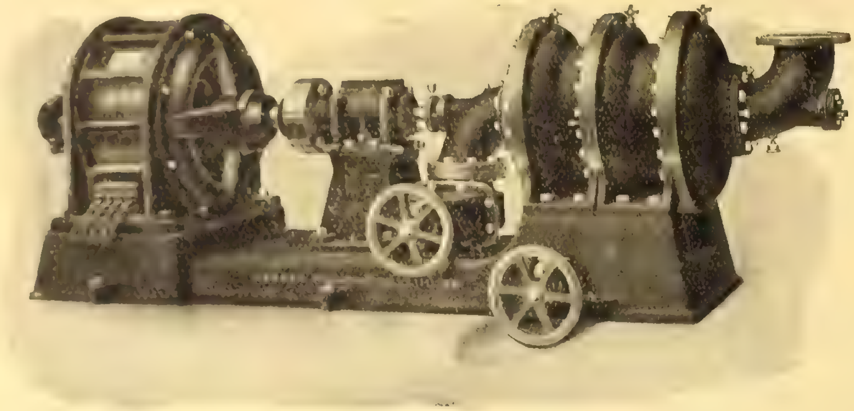
The process to which we subject the blocks makes them waterproof. Decay is also prevented, because the blocks are filled with creosote at moderate temperature.

The pavement will be found sanitary, quiet as tan bark and free from dust.

Dominion Carbolineum Works LIMITED

Vancouver, B.C.

Turbine Pumps



Single and Multiple Stage

Low Cost of Installation

Simple in Construction and Maintenance

Effecting Great Saving in Space and Cost of Installation

Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnigeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**

"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery

Right Here in Canada

Architects and Contractors can obtain marble with all the richness and depth of color that is to be found in the finest imported product.

Missisquoi Marble

is quarried in six distinct varieties which affords excellent opportunities for following out beautiful color schemes.

Light Grey
Dark Grey
Green Grey
Cream with Green Vein
Cream with Mottled Green
Cloudy Green and Pink

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
Bosse & Banks, Quebec
Jas Robertson & Co., St. John, N. B.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver
General Contractors' Supply Co., Halifax
Also Branch Office, 85 Sparks St., Ottawa, Ont.

THE
MILTON
PRESSED BRICK Co.
LIMITED

Made from the purest rock-transforming shale in the world. The shale is ground—is sifted and moulded under enormous pressure—and is dried, "burnt," and "flashed" in latest downdraft kilns. The result is the hardest, smoothest and cleanest brick known—capable of many beautiful colors and "flashings." Let us send you samples and prices.

Head Office: Milton, Ont. Toronto Office: Janes Building

MONTREAL AGENTS:
T. A. MORRISON & CO., 204 St. James St.

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of obsorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

Canadian on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

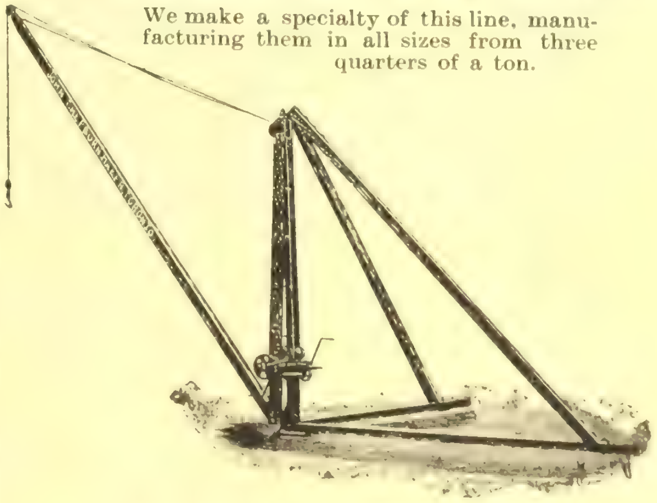
is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

Sewerage Acids do not affect the

Sizes 3 in. to 36 in.

The Standard for Quality in the United States and Canada

Fancy shapes in Chimney Tops, Fire Clay Stove Pipe and Fittings, Wall Coping, Fire Clay Flue Liners, Fire Brick and Fire Clay.

The Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES

True to Size.
Impervious to Water.
Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection) Park 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

Largest Manufacturers of

Glazed Earthenware
in the world.

Sewer Pipe
Single and Double. Strength, 3″ to 36″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

Contractors of Cement Tile, Say

If the Sand is Perfectly Clean—
If the Cement is First-Class—and—
If the Sand and Cement are used in "Proper" Proportions—
If the Sand and Cement are Properly Mixed—and—
If the Mixture is not too wet or dry (take your choice)
If the Mixture is used at once—then—
If the Mixture is thoroughly tamped in the moulds—and—
If the Moulds are not taken away too soon—then—
If the Tile are not allowed to stand in the sun or wind—
If the Tile are Properly "Cured" then the Product "May Be" all right to use for Drainage Purposes —and—"May" last for some time—
If the action of water or other Corrosive Impurities does not wash out the Cement and leave only a Crumbling mass of Sand.

The presence of one "If" in the construction of any drain should make one hesitate, but when "Ifs" are innumerable—well—who can afford to take a chance. There are too many "Ifs" connected with the making of Cement Tile.

There are no "Ifs" when using

Hamilton Vitrified Sewer Pipe

Tested for years. Solid as granite. When in place indestructible by anything except a convulsion of the earth, not subject to erosion by water, lasting qualities measured only by time.

Surely it would pay you to consider this matter carefully before finally deciding.

The Hamilton & Toronto Sewer Pipe Co.

HAMILTON and TORONTO Limited

Phones:—Toronto, Main 990, College 1558.—Hamilton, 3990-3991.

Corrugated Iron

For factories, elevators, warehouses, barns, etc.

"Galt" Corrugated Sheets

are the *cheapest*, *handiest*, and *most satisfactory* roofing and siding. Best for permanent buildings because, being made from high-grade galvanized iron, they are *indestructible* by time or fire. Best for temporary construction because they are easily removed and used again.

Complete line of Corrugated Ridge, Flashings, etc. Sheets of all sizes and gauges.

You should have Catalog 4-B illustrating these goods, free to readers of the Contract Record.

THE GALT ART METAL CO., LTD.
GALT, ONTARIO
Winnipeg - - Dunn Bros.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

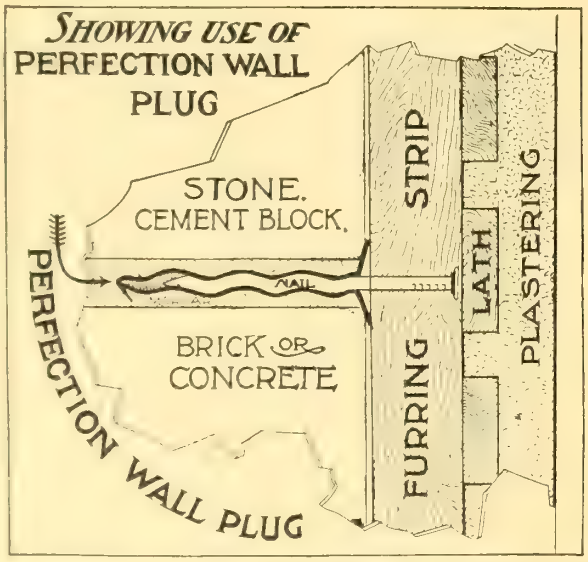
The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange



The coming attachment for furring to brick walls

Costs almost the same as a wood lath laid in the mortar joint. Infinitely better. Wood plugs (the best of old methods) can now be forgotten.

CLARENCE W. NOBLE
117 HOME LIFE BUILDING - TORONTO, ONT.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

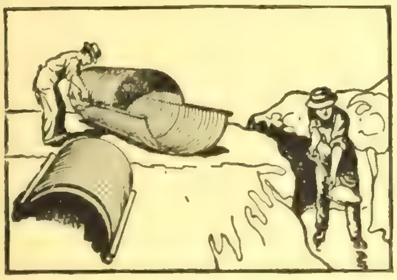
Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 180 St. James St. **Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade**

Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.

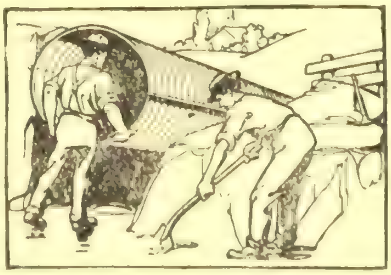


PEDLAR

NESTABLE GALVANIZED

CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivelled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

HALIFAX 16 Prince St.
LONDON 86 King St.
WINNIPEG 76 Lombard St
MONTREAL 321-3 Craig St
PORT ARTHUR 45 Cumberland St
OTTAWA 423 Sussex St.
TORONTO 111-113 Bay St
CHATHAM 200 King St. W.
QUEBEC 127 Rue du Pont
REGINA 1901 Railway St. S.
CALGARY 1112 First St. W
VICTORIA 434 Kingston St
ST. JOHN N.B. 42-46 Prince William St
VANCOUVER 821 Powell St

The Calkins Tile & Mosaic Co., Limited

458 Bleury Street,
Montreal

Tiles
Mosaics
Ceramics
Quarries
Marbles

We handle all classes of work from the largest contracts to the smallest requirements of the marble and Tile trade. Write us for prices.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING
AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
[illegible]		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.

Metropolitan Building, NEW YORK.

Local Agents in Montreal, Toronto and Ottawa.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers

Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save You Money { On the first cost of machine / On cost of operation / On cost of mixing concrete

OUR AUTOMATIC MACHINES do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired

We also manufacture a STANDARD DRUM BATCH MIXER in four sizes, 7 ft. 10 ft. 20 ft. and 30 ft. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent, 52½ Princess St., Winnipeg, Man.	Geo. B. Oland & Co. 28 Bedford Row, Halifax, N. S.	A.G. Brown & Co., 1048 Westminster Ave., Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada.

Hardwood Flooring

"Empire" Quality

Just Rockhard Facts

When you want Maple or Beech Flooring of "Empire" Quality, flooring which has been made from good lumber and has been kiln dried and manufactured properly, and grades which have not been "blended" to meet price competition send us your orders.

Competitive stock bought at a lower price is not a good advertisement to you if it results in a dissatisfied customer who will soon forget the difference in price but he will not forget the poor flooring.

Regardless of price our high standard of quality will not be changed, nor shall we try to fool you by mixing grades.

"Empire" Quality results from good lumber, superior millwork, years of experience, and the most careful and systematic attention to detail exactness.

PRICE and QUALITY are not [illegible]

J. R. Eaton & Sons

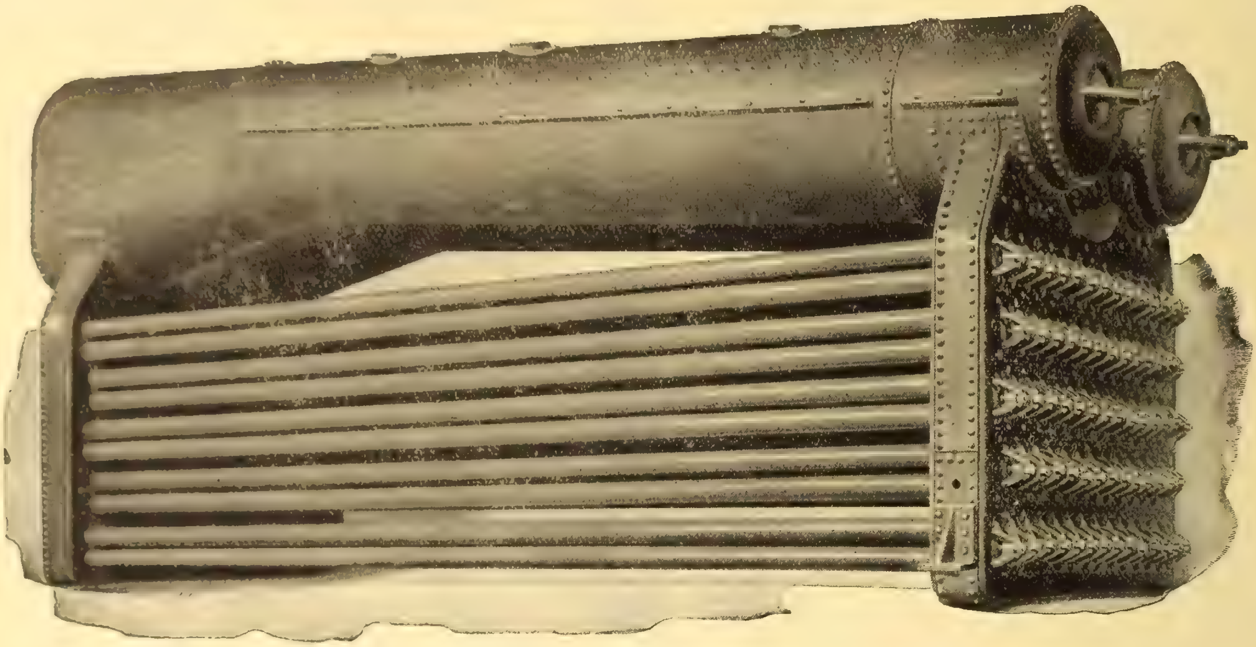
Orillia, Ontario

Montreal Agent. THE HARDWOOD FLOORING CO.,
55 St. François Xavier Street

Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Aylmer, Que.

The town of Aylmer has purchased the waterworks from M. W. J. Poupore and his associates.

Bright, Ont.

Tenders addressed to W. G. Henderson will be received until July 15th for construction of Anderson drain extension in the Township of Blandford. Plans, etc., at office of F. J. Ure, C.E., Woodstock, or at the office of the clerk, Bright.

Cumberland, B. C.

The ratepayers of Cumberland have rejected a by-law to authorize an expenditure of $20,000 for highly necessary sewerage works.

Dunnville, Ont.

T. W. Holmes, town clerk, sends us the following list of tenders for completion of sewerage system: John F. Connolly, Toronto, $10,705; Bennett O. Ramdon, Dunnville, $11,140; Lorendo and Marshall, St. Catharines and Dunnville, $12,595.50. Council deferred action until Monday, July 4th.

High River, Alta.

A by-law to spend $121,000 on water works and sewerage systems was defeated. There are prospects of the question being re-submitted.

Kamloops, B. C.

The matter of an additional reservoir is again before the council with a recommendation from H. K. Dutcher, construction engineer, for its installation.

Montreal, P. Q.

Tenders addressed to David Seath, secretary, Harbour Commissioners will be received until July 7th for supply of Portland cement. Specifications at above office.

Tenders will be received until July 8th for the construction of the sixth section of the Sherbrooke street sewer from Drummond to Guy street. City Surveyor Barlow.

Nanaimo, B. C.

The by-law to raise $25,000 for the water system improvement was carried.

North Vancouver, B. C.

City Engineer Hanes' plans for the sewerage system here have been officially approved.

Quebec, Que.

The Board of Control will call for tenders for paving in asphalt of Caron street, opposite Cartier church.

The following tenders were received in connection with the installation of waterworks at Chaudiere Curve: F. Sullivan, Montreal, $2,000,000; J. Bertram, Montreal, $255,000; B. Castigan, Ottawa, $245,000. Noted in last issue.

St. James, Man.

Tenders addressed to Frank Ness, secretary-treasurer, will be received until July 9th, for material and labor required in the laying of a 4 foot plank sidewalk.

Saskatoon, Sask.

Tenders addressed to J. H. Trusdale, city clerk, will be received until July 25th for the supply of 250 h.p. Water Tube Boiler. Plans, etc., at office of City Engineer, G. T. Clarke.

St. John, N. B.

W. Murdock, C.E., city engineer, writes that the award in connection with paving has been referred to a committee.

Tenders for laying permanent paving in Germain street, between Princess and Queen streets, were as follows: Carritte Manufacturing Company, sheet asphalt, $2.60 per yard; new curb stones, 93 cents per foot; old curb stones, 58 cents per foot; catch basins, $75 each.

McDonald and McLeod, sheet asphalt, $2.65 per yard; new curb stones, 90 cents per foot; old curb stones, 65 cents per foot; catch basins, $75 each.

The Westrumite Company, sheet asphalt, $2.55 per yard; new curb stones, 88 cents; old curb stones, 55 cents; catch basines, $75.

Albert R. C. Clarke, sheet asphalt, $2.95 per yard; new curb stones, $1; old curb stones, 65 cents, catch basins, $75. deferred.

Steelton, Ont.

Tenders addressed to J. Robinson, town clerk, will be received until July 13th for the following:

(a) Labor and certain materials, in construction of sewers.

(b) Vitrified tile pipe junctions.

(c) Cast iron manhole covers.

(d) About 600 feet of concrete sewer, sixty inches in diameter.

Plans at the office of above.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until July 19th, for laying a 6-ft. steel conduit from a connection with the present intake into Lake Ontario. Specifications, etc., at office of City Engineer.

Victoria, B. C.

A sewer by-law to raise $50,000 will be submitted shortly to the ratepayers.

Vancouver, B. C.

Tenders will be called for the laying of the sewer in Ward Five on Tenth avenue and continuing to the south city limits, the paving of Broadway, from Ontario to Scott; on Dunlevy avenue, from Hastings to Harris, and on First avenue, from Yew to Macdonald.

Welland, Ont.

The by-law to raise $60,000 to increase the capacity of the waterworks, was defeated; that for $13,000 for sewer carried.

Winnipeg, Man.

The Board of Control will call for tenders for sewer on Orleans and Rolans strets, from Red River to Carter avenue. Estimated cost, $21,000.

AWARDED.

Coldwater, Ont.

The following bids were received: (a) c. i. supply mains and distribution system; (b) ground reservoir; John F. Connolly, Toronto, Ont., (a) $17,877 (awarded contract), (b) $3,200; J. E. Farrell, North Bay, Ont., (a) $18,800; J. Cullon, Huntsville, Ont., (a) $19,879, (b) $2,789 (awarded contract); Clement and Curran, Ovellia, Ont., (a) $20,383; G. B. Moogk, Weston, Ont., (b) $3,500.

Hamilton, Ont.

City Engineer Macallum was awarded the contract to build a sewer on Charlton avenue at 65 cents, and on Wentworth street at 85 cents.

Moncton, N. B.

The council decided to purchase from W. H. Thorne and Co., St. John, a carload of White Bros. cement at $1.72 per bbl., and also a carload of Vulcan cement in bags, from Sumner Co., at $1.75 per bbl.

New Westminster, B. C.

The Hassam Paving Company, B. C., were awarded the contract for paving on Second street. Tenders given in last issue. The Pacific Construction Company was given a contract for laying concrete sidewalks at $13,750. J. W. B. Blackman, city engineer.

Nanaimo, B. C.

Macdougall and Company, of Vancouver, have been awarded a contract for the construction of $50,000 worth of sewers in this city, at their tender figure of $48,346. The work is to be completed within ten months. The estimate of the city engineer was $50,000. The tenders received were as follows:

The Pacific Coast Construction Company, Victoria, $74,945.

James C. Kennedy, Vancouver, $71,205.25.

Hugh Macdonald, Victoria, $59,523.

John W. Moore, Jr., Victoria, $53,751.

Outremont, Que.

T. Kruse, secretary-treasurer, writes that the contract for 10,000 feet of concrete sidewalk was awarded to G. Gilbert and Paye, 479 Huntley street, Montreal, at 22c. per square foot. The other tenders ranged up to 28½c. per foot.

Strathcona, Alta.

A. J. McLean, city engineer, writes that the contract for proposed paving in this city for 1910 has been awarded to the Bitulithic and Contracting Limited, at $3.00 per square yard.

Smith's Falls, Ont.

F. Dolan and Son, of Belleville, Ont., was awarded a contract for the construction of 40,000 square feet of concrete walks at 14½ cents a square foot, and crossings at 16½ cents. Other tenders were: H. A. Pruner, Ottawa, walks, 15¼ cents; crossings, 25 cents; H. Winstanley, Morrisburg, Ont., 14½ cents for walks, and 19 cents for crossings.

St. John, N. B.

Tenders for the construction of a sewer in the old Westmoreland road were as follows: W. J. Cain, $3.50 for rock and 50 cents for earth; Robert Short, $2 for rock and 40 cents for earth. Accepted.

W. J. Cain tendered for water main in [illegible] street, rock $4.50, earth 70 cents; a sewer and water main in Murray street [illegible] rock $3.50, earth 90 cents. The engineer thought this tender high, and the matter was left with him [illegible].

No tender had been received for the work in Bridge street. In this connection Ald. White moved the city put in the Bridge sewer at once, by days work. This was carried.

Two tenders had been received for the supply of cast iron pipe, Singleton, Dunn and Company quoted: 12-inch pipe, $28.06 per ton, 10-inch, $28.40 per ton, 8-inch, $28.91 per ton; 6-inch, $29.78. (Accepted.)

R. D. Woods, an American founder, quoted: 16, 14, 12, 8, and 6-inch pipe at $24.15 per ton, and 4-inch, $26.15.

The engineer pointed out that $8 a ton would have to be added to Mr. Wood's prices, as that was the amount of the American duty.

Vancouver, B. C.

Contract for the paving of Granville street from Ninth to Sixteenth avenues was recommended to M. P. Cotton at $56,366. For the grading of Sixteenth avenue from Bridge to Manitoba the successful tenderer was T. R. Nickson and Company, at $4,300. The tenders for the regrading of Pender street from Dunlevy to Campbell were referred to the engineer for report.

Wingham, Ont.

The contract for the laying of the sewers in Wingham was awarded to Messrs. Pidgeon and Reid, of Stratford, lowest tenderers.

Railroads, Bridges and Wharves

Arden, Man.

Tenders addressed to M. E. Boughton will be received until July 16th for the construction of steel bridge with stone or concrete abutments, etc. Plans, etc., at office of the above, or at the Department of Public Works, Winnipeg.

Everton, Ont.

Tenders are being received until July 14th for 2 concrete bridges. Bowman and Connor Toronto, engineers. For further information see advertisement in this issue.

Halifax, N. S.

A contract between the Provincial Government and the Halifax and Eastern Railway Company has been signed for the building of 204 miles of railway from Halifax to Guysboro, etc. Contract provides that company shall at once make surveys and plans of construction (which is to start by September, 1910, and be completed by Sept. 1st, 1913). Noted in issue of June 22.

Natashquan, Que.

Tenders addressed to R. C. Desrochers, Assistant Secretary, Department of Public Works, Ottawa, Ont., will be received up to the 19th of July, 1910, for the construction of a wharf here.

Port Arthur, Ont.

Port Arthur has a deputation at Ottawa urging that work on the breakwater outside the yards be completed without delay.

Tenecape, N. S.

Tenders are being called by the Public Works Department, Ottawa, Ont., until July 25th, for the construction of extension to breakwater. Plans, etc., at offices of district engineers, Halifax, and Antigonish, and on application to the local postmaster. R. C. Desrochers, assistant secretary.

Tracadie Harbor, P. E. I.

Tenders are being called by Public Works Department, Ottawa, until July 27th for construction of breakwater here. Plans, etc., at office of J. H. Hegan, district engineer, Charlottetown, and on application to postmaster at Grand Tracadie. R. C. Desrochers, assistant secretary.

Vancouver, B. C.

The ratepayers endorsed the by-law placed before them by city council to ratify an agreement regarding False Creek lands and foreshore, made between the city and the Canadian Northern Railway.

City Engineer Clement has been notified by Assistant Chief Engineer Stewart, of the Great Northern Railway, that he was recommending the construction of a bridge over the railway cut at Broadway.

The city engineer was instructed to prepare plans for a wharf at the foot of Balsam street and to call for tenders for the construction of an approach on Third avenue to the Granville street bridge.

AWARDED.

Armow, Ont.

P. B. Campbell, township clerk, writes that the tenders for building a bridge, 30-foot span, in the Township of Kincardine, were considered, as follows: C. S. Wood, $1,380; John Keyes, $1,140; Hunter Bridge and Boiler Company, $1,040 (accepted).

Chilliwack, B. C.

It is stated that the C. N. R. has let the contract for the construction of sixty miles of railway, between New Westminster and Chilliwack, B. C., to the Northern Construction Company, of Winnipeg.

Collingwood, Ont.

We have been informed that tenders for bridge on town line between Nottawasaga and Collingwood Townships, were received as follows: John Lockton, $738 (accepted); Frank Walker, $975; Wm. Alborough, $1,245; H. G. Wynes, $953; A. Cooper and Brother, $750.

Gordon, Ont.

We are informed that Frank Dufour has the contract for concrete abutments on bridge, Anderdon Township, at $685. F. Touragean tendered at $975.

Guelph, Ont.

The following contracts for bridges in the County of Wellington have been awarded: To J. H. and R. Beattie, Kelly's bridge, 16-ft. flat top, $289.25, two other bids; McGinn's bridge, 12-ft. flat top, $271.45, three other bids; Mickle's bridge, 12-ft. arch, $554.60, two other bids; Harper's bridge, 14-ft. flat top, $357.50, two other bids; Sanderson's bridge, 40-ft. flat top, $808.55, five other bids; J. Galvin, Four-Mile Creek bridge, 48-ft. arch, $1,690, four other bids; Simmons Brothers, Colquhoun's bridge, 24-ft. flat top, $376, four other bids; Mr. Clemens, Moorfield bridge, steel structure new abutments, $1,649, five other tenders; Hamilton Bridge Company, strengthening old bridge and putting in concrete floor, $669, six other bids; Jno. D. Callaghan, Gleming's bridge, 10-ft. flat top, $238, three other bids; Mr. Brydon, Damascus bridge, 12-ft. flat top, $235, three other bids. Bowman and Connor, consulting engineers, Toronto.

Kamloops, B. C.

The contract for the new C. P. R. machine shop and roundhouse here has been let to McDermott and Co., of Winnipeg. C. P. R. supply the steel. Estimated expenditure, $250,000.

Winnipeg, Man.

The National Transcontinental Railway Commission has awarded important contracts for the workshops at Winnipeg, in every case the contract being awarded to the lowest tenderer. The Morgan Engineering Company, of Alliance, Ohio, secures the contract for one 140-ton electric traveling crane; Mussens, Limited, of Montreal, have been awarded contracts for eleven electric (Booth) cranes; George Anderson and Company, Montreal, will supply one five-ton grey iron foundry crane, five hand power traveling cranes, and 15 (Gib) cranes, and twenty foundry equipment cranes goes to the Whiting Foundry Equipment Company, of Harvey, Ills.

Public Buildings, Churches Schools, etc.

Brantford, Ont.

Tenders addressed to M. E. B. Cutcliffe, chairman Building Committee, Public School Board, will be received till August 8, for plumbing, gas piping, electrical work, required in King Edward and Ryerson Schools. C. W. Hall, architect.

Balcarres, Sask.

Tenders addressed to J. D. McLean, secretary, Department of Indian Affairs, Ottawa, will be received until July 16th for the erection of a brick veneered school at File Hills, near here. Plans, etc., at Indian office, Winnipeg; also at office of Dominion Lands, Regina.

Bervie, Ont.

Tenders addressed to ~. McComb, secretary-treasurer, Bervie, will be received until July 9th for repairing, etc., of school house in Sec. 9, South Line, Kincardine Township.

Duncans, B. C.

The King's Daughters, at their convention in Vancouver, decided to erect a convalescent home here. Miss Leitch, Provincial secretary, Victoria.

Gladstone, Man.

The skating rink and grand stand in the exhibition grounds were completely wrecked by the gale of the 22nd ulto.

Ladysmith, B. C.

Tenders were called until July 4th for erection of public hospital, according to plans prepared by S. F. Birds, A.R.I.B.A. W. J. Forbes Robertson, chairman Hospital Building Committee.

Midland, Ont.

Tenders are being called until July 18th for the erection of a new school at Old Fort. Plans, etc., at home of A. Parker, Old Fort.

Mitchell, Ont.

Mr. T. Hepburn, architect, Stratford, is preparing plans for remodelling the town hall, etc. Tenders will be asked for as soon as the plans are completed.

Montreal, Que.

A permit was issued for construction of basement of St. Zotique church, on Notre Dame street. Present expenditure on church, $25,000; on presbytery, about $15,000.

The Government has authorized T. Daoust, 90 St. James street, to prepare plans for the remodelling of the old post office on St. James street. Government appropriation, $80,000.

It is reported that a new building will be erected by the Notre Dame hospital authorities shortly.

The Grey Nuns will erect a large building on the property at the corner of Sherbrooke, Milton and St. Lawrence Boulevard.

Northfield, Ont.

The Advent Church, George Rupert's residence, and a large public hall, were destroyed by fire on the 29th ulto.

New Westminster, B. C.

Tenders for the construction of the new Royal Columbian hospital will be called for this week.

A horse show building with seating capacity of $3,500, an arena 75 feet by 200 feet in the clear, and an amphitheater 130 by 270, will be erected for the Provincial exhibition. It is expected that much of this structure will be finished in time for this year's show.

Ottawa, Ont.

Tenders addressed to R. C. Desrochers, assistant secretary, will be received until July 11th for the supply of boilers, etc., for Langevin Block. Plans, etc., at above department.

Phoenix, B. C.

Theo Phoenix school board will shortly commence preparations to build a new school which will cost about $12,000. C. B. McAstocker, chairman; P. J. Cosgrove and T. A. Love, secretary.

Prince Albert, Sask.

The ratepayers have decided to take over the hospital. A nurses' home will be erected, and about $5,000 spent in improving the hospital.

Quebec, Que.

The federal department of militia will erect a two-storey ordnance steel building at the foot of Palace Hill in proximity to the arsenal.

Swift Current, Sask.

Tenders addressed to W. H. Field, secretary, school board, will be received until July 8th for the erection of addition to school. Plans, etc., obtained from the above mentioned, or from Storey and Van Egmond, architects, Regina and Saskatoon.

Somerset, Man.

Tenders addressed to Board of School Trustees of Richard school district, No. 1092, will be received until July 11th, for the instalment of a low pressure steam heating plant, and fire escape. J. A. DeCosse.

St. Emard, P. Q.

It is stated that the Protestant Public school will shortly be erected in this municipality.

Strathcona, Alta.

The plans for the new school building, to be erected east of Mill Creek, are to be seen at the offices of Messrs. Wilson and Herald, Whyte avenue. It is expected that the school board will now be in a position to call for tenders at an early date. Estimated cost, $15,000.

Toronto, Ont.

Theron Gibson has been appointed chairman, and A. H. Jeffrey, secretary of the committee to procure site for Grosvenor street congregation. Noted previously.

It is stated a new and up-to-date vaudeville house is to be erected on the corner of Yonge and Shuter streets. Cost $25,000. D. J. Bondy, of California, is interested.

In regard to the tenders for band stand, the lowest was $4,565, ranging up to $7,787. Board of Control's estimate, $2,000. No decision.

It is stated that nearly ten acres have been presented to Bishop Strachan School as a site for new school. S. H. Jones, bursar. Plans are being prepared.

Tenders will be received until July 12th for heating palm house in Allan Gardens. G. R. Geary, chairman Board of Control.

The Unitarian Church, Jarvis street, are to consider in the fall the advisability of changing their location. R. J. Hutcheon, pastor, is away until September.

Victoria, B. C.

A by-law to raise $45,000, the amount estimated for the new isolation hospital, recommended by the city council, will probably be submitted shortly.

Vancouver, B. C.

C. T. Perry of this city has prepared plans for St. James Church, Cordova street and Gore avenue. Material, stone throughout. Estimated cost, $100,000.

Winnipeg, Man.

Tenders are being called by the Public Works Department, Ottawa, Ont., until July 18th, for customs and savings bank fittings. Plans, etc., at above department and on application to J. Greenfield, resident architect. R. C. Desrochers, assistant secretary.

Tenders will be received by J. H. G. Russell, architect, Silvester-Willson Building, until July 7th, for the erection and completion of a brick and reinforced concrete hospital building for the Children's Hospital Board.

AWARDED.

Dresden, Ont...

We are informed that the contracts of the Dresden School building were let as follows: Blonde Lumber and Mfg. Co., masonry and plastering, carpenter work, roofing, tinsmithing, slate black boards, painting, and glazing.

In the above the Blonde Company included the local tenders for roofing, tinsmithing, and slate blackboards, as submitted by Wells and Wells, Dresden, Ont.

The heating and ventilation has been let to J. B. Carscellan at Dresden, the system to be hot air.

The plumbing, electric wiring have not been let yet.

Montreal, P. Q.

G. A. Monette, architect, 97 St. James street, has awarded the general contract for the erection of St. Jean Berchmans chapel and school, corner Shaw and Comte streets, to O. Villeneuve, contractor.

Contracts have been awarded as follows for erection of Church and Presbytery for the parish of St. Zotique, P. Q.: General contract, D. Gagne; stone work, Filion Freres; brick work, J. D. F. Villemaire. Messrs. MacDuff and Lemieux, architects.

North Toronto, Ont.

The tender of Mr. N. Auld was accepted for the construction of a basement under the town hall for $840. Mr. Schulkins received the contract for the installing of the steam heating plant at $1,045.

Quebec, Que.

Tenders for the construction of a wall on the seminary property between the Archbishop's Palace and Laval University, in Rampart street, was awarded to Mr. Alphonse Cote, for $6,872.

Toronto, Ont.

The Property Committee of the Board of Education have awarded the following contracts for repairs to and extensions of school premises in the city: Carpentry, Humberside Collegiate, O. C. Pook, $326; Parkdale Collegiate, W. Eaton, $576; Riverdale School, W. Williamson, $220; painting, F. J. Cox, $307. Enlarging Howard street school: Masonry, R. Hewitt and Son, $13,491; reinforced concrete, A. Gardner and Co., $3,700; carpentry, M. Hutchinson, $6,385; structural steel work, W. H. Salter, $1,000; roofing, A. B. Ormsby Co., $1,098; plastering, Beaver and Company, $1,700; painting, J. Phinnemore, $1,025; heating and ventilating, W. F. Rutley Co., $3,300; plumbing, Fred Armstrong, $1,531. Pape avenue school: Masonry, R. Chalkley and Son, $1,875; carpentry, W. Eaton, $375; roofing, Flowers and St. Leger, $6; painting, T. Barett, $250. Shirley street school: Masonry, R. Hewitt and Son, $2,000; carpentry, W. Eaton, $410; roofing, Flowers and St. Leger, $58; painting, R. J. Wray, $145. Pyne school: Carpentry, C. Hollett, $2,020; painting, J. Taylor, $270. Contracts for general carpentry were awarded for nine other schools at amounts varying from $86 to $427; also 13 for painting at the same number of schools, which ranged from $160 to $365. Mr. W. J. Simmons secured the contract for grading and sodding at Clinton, Ogden, and McCaul schools, at $255.

Victoria, B. C.

The contract for the improvements to the plumbing at the South Park school to Colbert and Company, at $1,827, was awarded.

Vancouver, B. C.

Rankin and Cherrill have been awarded the contract for wiring the interior of the industrial building on the exhibition grounds, at $725. There will be 22 arc and 190 incandescent lights. The exhibition association is now seeking for tenders for decorative lighting of the exterior of the industrial building and grounds. The tender calls for 8,000 incandescent and 25 arc lights.

Watrous, Sask.

Adam Reid, this town, was awarded the contract for the erection of the Manitou Lake Sanatorium, at $50,000. President of the company, J. Erzinger; Dr. E. N. Morrel, Winnipeg, secretary-treasurer.

Wainwright, Alta.

We are informed that the contract for the erection of brick school was awarded on the 27th ulto., to P. D. Laird and Son, this city, at $15,000. Others tendered as follows: Neil Stewart, Saskatoon, $17,950; T. E. Dolan, Wainwright, $16,500; T. J. Brocklebank, Melville, $13,790 (not regular); W. D. McKay, Wainwright, $15,775; Alberta Construction Company, $14,400; H. V. Fieldhouse, secretary-treasurer.

Residences

Brandon, Man.

The officers of St. Paul's Presbyterian Church are considering the erection of a new manse. Mr. W. H. Sillinglaw has been commissioned to prepare plans.

Hamilton, Ont.

Recent building permits include:

Henry Dunham, brick dwelling on Charlton avenue, for Mrs. A. Campbell, $2,700; W. A. Pettit, brick dwelling on Central avenue, Fred Stone, $2,200.

Montreal, Que.

Messrs. MacDuff and Lemieux are preparing plans for the erection of a residence in St. Henri for Mr. Villemaire.

Plans have been prepared by J. Ouilty Harris for the erection of a residence in Notre Dame de Grace, [illegible] dence, for Mr. George Marcil. Estimated cost $[illegible].

St. Thomas, Ont.

The old St. John's church, on Balaclava street, has been purchased by Mr. Horton, contractor. Mr. Horton will erect two modern two-storey red pressed brick residences on the site.

Victoria, B. C.

Plans have been drawn for a handsome residence on Oak Bay avenue for Max [illegible]. Building operations will commence shortly.

Vancouver, B. C.

Mr. R. D. Patterson has made application for a permit for a handsome new residence at [illegible] Thirteenth avenue west, to cost $4,000.

On Granville street a permit was granted for a $40,000 four-storey brick built rooming house for Mr. C. P. Gustafson.

Winnipeg, Man.

H. Browning has secured a permit to construct an apartment block on the north side of St. Mary's, at $15,000.

The following permits for dwelling houses were issued recently:

West End Realty Company, west side Banning street, $3,600; W. McIntosh, west side Home street, $4,200; G. L. Stephenson, north side of William, $5,500; John Beattie, south-east corner of Banning street and Emarson avenue, $2,700.

AWARDED.

Montreal, Que.

General contract for the alterations to residence of Mr. H. S. Holt, on Stanley street, has been awarded to Chas. Thackeray Co., general contractors, 127 Stanley street. Architect, H. C. Stone, 84 St. Francois Xavier street.

Mr. Alex. MacKay is erecting two apartment houses on Oldfield avenue. Contract for the erection of the masonry and brickwork, has been awarded to Wm. McArthur and Sons, contractors, 459 Clarke avenue, Westmount. Architect, J. Seath Smith, 207 St. James street.

Contract for the wiring in connection with the additions to the Alliance Building has been awarded to M. Rubenstein, 342 St. James street. General contractors, J. and W. Morrison, Latour street.

The following contracts for plumbing and heating have been awarded to John A. Gordon, 301 St. Antoine street: Residence, Hon. Frank Gilman, Arlington avenue, Hutchison, Wood and Miller, architects; house, B. Tansey, Belmont street, W. E. Doran, architect; Welcome Hall, St. Antoine street, Ross and McFarlane, architects; two tenements on Esplanade avenue, for E. J. Rivet.

Business Buildings and Industrial Plants

Allandale, Ont.

The shipping sheds and weigh house of the Grand Trunk Rrailway nere were destroyed by fire on the 2nd inst. Estimated loss, $[illegible].

Bridgeburg, Ont.

Plans for the shipbuilding plant and dry dock here are now being prepared. Buffalo capitalists are interested.

Brandon, Man.

Tenders were called until July 4th for erection of four-storey warehouse for the Cockshutt Ploy Company. J. C. H. Inkster, local agent. Noted previously.

Cascapedia, Que.

A company is seeking permission to construct a dam at Cascapedia and erect a lumber mill, the whole to cost about $200,000. Hon. Jules Allard, Minister of Crown Lands; Senator Edwards, H. G. Turner, engineer, New York, and Angus McClean, Buffalo, are interested parties.

Hamilton, Ont.

The Hamilton Brick Company suffered serious loss by fire on the 1st inst.

Lavallee, Ont.

It is stated that the hotel, Canadian Northern Railway station, and mill were destroyed by fire on the 30th ulto.

Monckton, Ont.

The grain elevator owned by Hay Bros was destroyed by fire recently. Loss, $2,800.

Montreal, P. Q.

Tenders are now being received for the general contract for erection of the Dominion Express Building, on St. James street, and these will close July 12th, at the office of Mr. W. S. Painter, C. P. R. Architect, Windsor station.

Lawrence A. Wilson and H. A. Dorsey, incorporated under the name of the Carslake Hotel Company, Limited, have purchased the Carslake Hotel property on St. James street. The sum of $75,000 will be expended on additions to the property on Windsor street about the 1st of September.

The Montreal News Company's premises on St. James street were badly damaged by fire on the 1st inst. Loss, about $8,000.

Ottawa, Ont.

Plans for two large drydocks have been approved by the Government. One is to be built at Sault Ste. Marie, and the other at Vancouver. The Sault dock is to be seven hundred feet long and cost $900,000. The Vancouver dock is to cost about $1,200,000. This is to be a floating dock, with a lifting capacity of fifteen thousand tons. The company contemplate the operation of a car construction plant in conjunction with its drydock and shipbuilding and repairing industry. The car works will involve an additional outlay of $250,000.

The Canadian branch of the Beaver Company, of Buffalo, N.Y., will locate here. It is announced that work will start immediately on the erection of a factory building. J. MacGlashan, representative.

Portage la Prairie, Man.

The Hart Parr Gasoline Engine Company are looking for a favorable site for warehouses, which they purpose erecting when site is secured. I. P. Porter, local agent.

Spanish River, Ont.

The saw mill of Wm. Milne & Sons, Limited, was destroyed by fire on the 28th ulto. Estimated total loss, $40,000.

Saskatoon, Sask.

Tenders will be received at the office of the Sawyer Massey Company, Limited, Winnipeg, until July 9th for the erection of a reinforced concrete and brick warehouse here. Plans, etc., at office of the secretary, Builders' Exchange, Winnipeg, also at the offices of the architect, Yorkton, and this city.

St. Lambert, P. Q.

The Monarch Electric Company propose to establish a manufacturing plant in St. Lambert, providing the local council will grant exemption from taxes and also free water for twenty-one years.

Toronto, Ont.

The Roman Stone Company has specifications out for an immense new building.

Victoria, B. C.

Messrs. P. Burns and Company have purchased a site on Store street, where, it is stated, they will erect a cold storage plant and warehouses. Estimated expenditure, $90,000.

Vancouver, B.C.

Plans were passed for a brick warehouse on the C. P. R. reserve, Beatty street, to cost $22,000. A $21,000 structure for warehouse purposes will be erected in the same locality for Messrs. E. C. Prior and Company.

On the 27th ulto. fire destroyed the buildings and plant of the Eagle Harbor Packing Company, on Howe Sound, ten miles from this city. The loss is estimated at $50,000.

The Dominion Stock & Bond Corporation have purchased property on the corner of Granville and Cordova streets. It is stated that a large building will be erected on the acquired site.

A permit was taken out by the Vancouver Milling and Grain Company for $40,000, and covers a new warehouse and grain elevator on the company's tract on the Canadian Pacific Railway reserve. Mr. J. A. Sayward also obtained a permit for a six-storey structure, but three storeys are all that will be erected at present. Messrs. G. C. Mesher and Company have secured the contract. The cost of the building is placed at $100,000.

W. Owen, C.E., of London, Eng., is authority for the statement that the company he represents will shortly establish a large steel plant here, for which about 50 acres have been secured. Estimated expenditure, $15,000,000. Preparations for construction will start immediately after registration, which will probably be during the last week of August.

Waterloo, Ont.

The Dominion Box Factory was destroyed on the 1st inst. Loss about $30,000.

Welland, Ont.

The bylaw to grant fixed taxation to the Peters Company, who will build a three-storey brick factory here, was carried.

Winnipeg, Man.

The Alaska Bedding Company's factory was damaged on the 29th ulto. to the extent of about $35,000.

Tenders addressed to D. W. McCuaig, chairman, Manitoba Elevator Commission, 279 Garry street, were received until July 5th. Plans, etc., at office of above.

Tenders addressed to James Chisholm and Son, architects, were received until July 2nd for purchase and removal of buildings and necessary excavation, etc., required by the Royal Realty Company, corner of Portage avenue and Smith street. Information at office of the above.

Dingle and Stewart have a permit for a two-storey addition to their building at 263 Stanley street, $10,000.

Tenders are called until July 6th for erection of building for the Empire Meter and Engine Company. Plans, etc., at office of the architect, W. W. Blair, Nanton Building.

AWARDED.

Montreal, Que.

Contract for alterations to the premises of Mark Workman, Notre Dame street, have been awarded as follows: Wood work and painting, J. H. Randolph & Company;

plumbing, R. N. Sevigny. Messrs. MacDuff & Lemieux, architects.

W. Beverley Robinson has closed a contract with A. Rosenthal & Sons, Limited, of Ottawa, to supply Doulton & Company's glazed terra cotta "Carrara" for the new shop being erected on Sparks street.

St. John, N. B.

We are informed that the contracts for the following trades in the extension of the St. John Exchange were awarded as follows: Masonry, B. Mooney and Sons; carpentry, A. E. Hamilton; structural steel, etc., Jas. Fleming; painting, J. Johnston; sheet metal, Jas. McDade; roofing, G. S. Fisher and Son; electric wiring, heating, and plumbing, not yet awarded. G. Ernest Fairweather, architect.

Victoria, B.C.

We are informed that Dinsdale & Malcolm have been awarded the contract for the erection for Sweeney & McConnel, printers, of brick building, three storeys and basement, enamelled brick front, at $14,000; also that the amount of contract for Drake Hardware Company's building is fixed at $15,000. Noted in last issue. H. Griffith, architect.

Waterloo, Ont.

The Sanitary Flooring Company, of 544 King street west, Toronto, have been awarded the contract for laying "Sanorta" flooring in the new Grand Trunk station.

Power Plants, Electricity and Telephones

Belleville, Ont.

Tenders will be received until July 6th for the erection of a power house for the Brockville Light and Power Department. B. Dillon, architect.

Ingersoll, Ont.

Mr. Ross, of the firm of Ross and Holgate, Montreal, has been engaged to prepare plans, get tenders, and generally supervise the recently-acquired plant of the Ingersoll Electric Power and Light Company.

Kenora, Ont.

It is stated that the Reese Engineering Cimpany have acquired the Keewatin Power Company's power and property. The intention is to supply several Manitoba municipalities, of which it is stated Brandon has accepted an offer equivalent to 2,500 h.p. at $20 per h.p. Date fixed for delivery, December, 1911.

Kingston, Ont.

The Seymour Power and Electric Company are offering the supply of electric power at $25 per h. p.

New Hamburg, Ont.

Tenders are being received until July 18th for electrical apparatus. E. B. Merrill, 59 Yonge street, engineer. W. Millar, town clerk. For further information see "Tenders and For Sale Department" of this issue.

Ottawa, Ont.

The Municipal Electrical Department is calling for tenders until July 7th for 42,000 feet of vitrified clay conduit, 4 k.w. air blast transformers, with blower equipments, and 25 manhole covers. J. E. Brown, superintendent.

Regina, Sask.

Tenders addressed to S. P. Porter, Deputy Minister Railways and Telephones, will be received until July 12th for erection and installation of the following exchanges: Watrous, Outlook, Scott, Humboldt, Vonda(Davidson, Craik, Broadview, Whitewood, Carlyle. Plans, etc., at Department of Railways, etc.

Strathcona, Alta.

The municipality of Leduc has asked this city to supply electric light and current for power purposes. Ald. Richards, chairman of Fire and Light Committee.

Welland, Ont.

The by-law to grant franchise to electric railway through the town was carried; that for electric fire alarm defeated.

AWARDED.

Montreal, Que.

Messrs. Ross and Greig have been awarded the contract for the installation of four tandem compound Goldie and McCullough engines in the Chateau Laurier, Ottawa.

Miscellaneous

Montreal, Que.

Recent building permits include: Jos. Beaulac, 1127 Laurier avenue, six houses containing eighteen dwellings, $22,000; Ant. Viens, 1024 Cartier, six houses containing eighteen dwellings, $10,800; H. Forget, 1956 Dufferin, three houses containing six dwellings, $6,000; E. Laliberte, 204 Bernard, one house containing two dwellings, $3000; J. T. Decarier, 365 Decarie avenue, one house, $3,500; M. Villeneuve, 131 St. Elizabeth du Portugal, one house containing three dwellings, $2,700; James Scott, 651 St. James, business block, $10,000; O. Galarneau, 2337 St. Lawrence, two houses containing four dwellings, $6,000; Dominion Trust Company, Wilder Building, two houses containing four dwellings, $9,000; Mrs. J. B. Papineau, 49 Marechal avenue, one house containing two dwellings, $3,000; Mrs. E. Shirres, 583 Dorchester street, one house, $20,000; F. E. Merritt, 205 St. James street, one house, $14,000; H. J. Ferguson, London Lancashire Building, one house, $12,000; G. H. Hansen, 2692 Manse, one house containing two dwellings, $3,000; T. Danien, 1132 St. Dominique, one house containing three dwellings, $4,500; L. Aubuchan, 603 Laval, one house, $2,800; A. Bilodeau, 132 Beaubien, two houses containing six dwellings, $6,000; J. A. Stevenson, Montreal, two houses containing eight dwellings, $10,000; Laliberte, 206 Beaudry, two houses containing five dwellings, $5,000; E. Varin, 1372a Parthenais, one house containing three dwellings, $3,000; A. Dumont, 1127 Cadieux, one house, $4,500.

Ottawa, Ont.

This municipality is receiving until September 2nd tenders for the purchase of $362,800 30-year debentures, and $257,707.11 20-year. Chas. Hopewell, mayor.

Toronto, Ont.

The city engineer has been requested to report to the board, estimate of the cost of construction of concrete wall in front of the Lake Front boulevard, from the westerly limit of the wall now under construction at Grenadiers' Pond, to the Humber river.

Recent building permits include:

W. H. Harris, 2-storey brick stable, on 330-2 Gerrard street east, $5,000; J. L. Nichols Company, 2-storey brick factory, 184 Spadina avenue, $20,000; J. S. Hedge, 8 detached 2-storey brick dwellings on Weston road south, $16,000; F. Johnston, 3-storey brick stores, 1650-2 Dundas street, $12,000; J. M. Walker, 1 pair semi-detached 2½-storey brick dwellings, on Sunnyside, $5,80;0 J. Pherrill, 2 detached 2-storey brick dwellings, on Wright avenue, $6,000; Pinchin Johnston Company, 4-storey brick factory, on Carlaw, $26,000; Mrs. Hills, 5 attached 2-storey brick stores and apartments, Terauley, $12,000; G. M. Bryan, 3-storey brick addition to restaurant, 15 Temperance, $6,000; Henry Carter and Dubois, 189 Amherst, three houses containing nine dwellings, $11,000; B. Damiens, 898 Mount Royal avenue, two houses containing two dwellings, $10,000; A. Marsolais, 209 St. Andre, two houses containing eight dwellings, $4,500; A. Jarry, 125 Boyer, one house containing two dwellings, $3,500; L. Dalbec, 287 Garnier, three houses containing six dwellings, $4,500; W. Robitaille, 819 Sanguinet, one house containing two dwellings, $3,000; A. Robillard, 408 St. Denis, two houses containing six dwlelings, $8,000; A. Duranleau, 44 St. Lawrence, one house containing three dwellings, $8,000; J. M. Wilson, 678 St. Urbain, one residence, $45,000; Jos. Laurier, 385 Ontario east, one warehouse, $8,000; Alex. MacKay, St. Martin street, four houses containing sixteen dwellings, $24,000; N. Deslauriers, 482 Sherbrooke, three houses containing nine dwellings, $18,500; T. A. Waterson, 831 Albert, one house containing three dwellings, $4,000; H. Jaffery, 19 St. John, six houses containing six dwellings, $21,000; H. L. Deslauriers, 1427 Papineau, one house containing five dwellings, $4,000; Z. Coulombe, 431 Garnier, two houses containing six dwellings, $4,000; T. Clermont, 544 Frontenac street, one house containing six dwellings, $3,000; P. Demers, 115 Van Horne avenue, one house, $4,000; F. X. Company, 2-storey brick dwelling, Concord, $6,000; Weismiller and MacKenzie Brothers, 2 detached 2-storey and attic brick dwellings, Marion street, $6,000; Wm. Horwood, 3 attached 2-storey brick dwellings, corner Shaw and Yarmouth, $6,000; R. McCauley, 2 pair semi-detached 2-storey and attic brick dwellings, 769-775 Markham street, $10,000; Bachrach and Company, alterations to store, corner Albert and Yonge streets, $5,000; Massey-Harris Company, 3-storey brick addition to factory, King street, $7,500; Standard Bank, 2-storey brick bank and dwelling, corner McCaul and Caer Howell, $7,500; W. S. Meredith, 2-storey brick dwelling, Glendale, $5,800; Standard Bank, 3-storey brick bank and dwelling, 249 Avenue road, $10,000; Standard Sanitary Manufacturing Company, 6-storey brick and steel warehouse, corner Royce and Lansdowne, $45,000; M. H. Pringle, 1 pair semi-detached 2-storey brick dwellings, 128-130 St. Helen's avenue, $5,500; C. O. Lasby, 1 pair semi-detached 2-storey and attic brick dwellings, Roncesvalles avenue, $6,000; Dr. K. Peaker, 2-storey brick dwelling, 8 Laxton avenue, $5,500; John Stacey, 4 pair semi-detached 2-storey roughcast dwellings, brick fronts, Carlaw avenue, $5,000; J. Singer, 2 pair semi-detached 2½-storey brick dwellings, Stephanie street, $8,000; H. O'Hara, 2½-storey brick dwelling, Elm avenue, $9,000; R. Gillies and Company, 2 pair semi-detached 2-storey brick dwellings, Fern avenue, $11,200; Malachi Yetman, 3 pair semi-detached 2-storey brick dwellings, Dufferin, $12,000; W. W. Hiltz, 2 detached 2½-storey brick dwellings, Danforth avenue, $6,500; R. C. Bustard, 4 pair semi-detached 2½-storey brick dwellings, Pricefield, $22,000; Sisters of Our Lady of Charity, 1-storey brick addition to laundry, West Lodge avenue, [illegible]; J. J. Washington, 2 pair semi-detached 2-storey brick dwel

(Continued on page 31)

Tenders and For Sale Department

Notice to Contractors

Tenders will be received by registered post [illegible] to the Chairman of the Board of Control, City Hall, up to noon on TUESDAY, JULY 19, 1910, for laying a 6-foot [illegible] in connection with the present [illegible] Ontario a distance of 500 feet, including all connections.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and plans may be seen, and forms of tender obtained at the office of the City Engineer, Toronto.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor),
Chairman Board of Control.

City Hall, Toronto, July 4, 1910. 27

Department of Railways and Canals, Canada

Quebec Bridge

Tenders for Superstructure

Notice to Contractors

Sealed tenders, addressed to the undersigned and endorsed "Tender for Quebec Bridge Superstructure," will be received at this office until 12 o'clock noon, not later than SEPTEMBER 1ST, 1910, for the superstructure of a Bridge across the St. Lawrrence River near the City of Quebec.

Plans and specifications may be seen and forms of tender obtained on and after July 1st, 1910, at the office of the Quebec Bridge Board of Engineers, Canadian Express Building, Montreal, and at the Department of Railways and Canals, Ottawa.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $500,000, made payable to the order of the Minister of Railways and Canals of Canada, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted and in accordance with the terms stated in the form of contract accompanying the specifiactions.

Cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The lowest or any tender not necessarily accepted.

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 17th June, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 28

NEW HAMBURG

Debentures for Sale

Tenders will be received by the undersigned up to 2 o'clock p.m., JULY 18TH NEXT, for the purchase of $8,000 4½ per cent. Electric Light Debentures of the Village of New Hamburg, payable in thirty equal annual instalments.

WM. MILLAR,
Clerk.

New Hamburg, June 23rd, 1910. 28

Sealed Tenders

marked "Tenders for Bridge," will be received by me at my office, in the County Buildings, in the Town of Cornwall, until 12 o'clock noon, of MONDAY, THE 18TH DAY OF JULY, 1910, for making the necessary excavation and the construction of a reinforced Concrete Arch Bridge over the River De Lisle, on the Military Road about one and one-half miles north of the Town of Alexandria, in the County of Glengarry; also the grading of approaches and the construction of wing-fences. The estimated quantities are as follows:

95 cubic yards reinforced concrete.
232 cubic yards excavation.
4¼ cubic yards rock excavation.
760 cubic yards grading.
342 feet of wing fence.

Plans, specifications, etc., may be examined and forms of tender procured at the office of Magwood & Walker, Civil Engineers, Cornwall.

A marked cheque or cash deposit equal to 10 per cent. of the tendered price must accompany each tender.

The lowest or any tender not necessarily accepted.

A. I. MACDONELL, Counties' Clerk,
Stormont, Dundas and Glengarry,

27

Notice to Contractors

Sealed tenders addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, endorsed "Tender for Section No. 6, High Level Interceptor," will be received by registered post only, until noon of TUESDAY, JULY 26TH, 1910.

The sewer consists approximately of 1,340 lineal feet of reinforced concrete pipe sewer, 5 feet internal diameter, extending from Defoe street at Stanley Park in a northerly direction to a point about 500 feet north of Queen street.

Specifications can be obtained from and original drawings will be on file and can be seen at the Main Drainage Department, City Engineer's Office.

For the convenience of contractors, sets of blue prints have been prepared and will be issued to contractors upon the deposit of $5.00, which amount will be refunded upon return of blue prints in good condition within thirty days of receiving tenders.

The usual conditions relating to tenders as prescribed by City By-law must be strictly complied with or the tender will not be entertained.

The lowest of any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, June 23rd, 1910. 26

Canadian Pacific Railway

Central Division

Tenders are hereby requested for the construction of Piers, Abutments and Pedestals for Bridge over the Kaministiquia River at Fort William. Plans, specifications and forms of proposal can be seen at the office of the Engineer of Bridges, Montreal; Division Engineer, Toronto, and Division Engineer, Winnipeg. Proposals must be made out on the Company's standard proposal form, and sealed in an envelope, plainly marked "Proposal for Kaministiquia River Bridge, Fort William." These must be delivered at the office of the Division Engineer, Winnipeg, by 12 o'clock JULY 15TH. The right is reserved to reject any or all proposals.

(Signed) FRANK LEE,
Division Engineer.

28

For Sale

Steam Shovel

One Style "A" Marion Steam Shovel, 1½ yard dipper capacity, about 45 tons working weight, in first-class condition, with new extra heavy reinforced boom, latest style new independent crowding engines, all thoroughly overhauled, the boiler just re-tubed. Can be inspected where it is now working. Offered subject to inspection and acceptance before shipment, and subject to prior disposition.

Apply

F. H. HOPKINS & CO.,
New Imperial Bank Bldg., Montreal.

24

City of Moose Jaw

Saskatchewan

Main Drainage Works

Sealed tenders endorsed "Tender A," "Tender B," etc., will be received by the undersigned City Clerk until 8 o'clock, p.m., on MONDAY, JULY 18TH, 1910, for the following:

Contract "A." Supplying material for and constructing Sewage Disposal Plant complete, and laying Trunk Sewer.

Contract "B." (1) Supplying and installing a complete Air Lift System; (2) Supplying and installing one electrically-driven Centrifugal Pump and Auto Starter.

Contract "C." Supplying and delivering 3,000 cords of Field Stone.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw, and also at the office of the "Canadian Engineer" at the following addresses:

Toronto, 62 Church Street.
Montreal, B33 Board of Trade Building,
Winnipeg, Room 404 Builders' Exchange Buildings.

The lowest or any tender not necessarily accepted.

J. M. WILSON,
City Engineer.

W. F. HEAL,
City Clerk.

Moose Jaw, Sask., July 16th, 1910. 28

County of Wellington

Bridge Tenders

Tenders will be received up to the hour of letting at Everton, at 2 p.m., on THURSDAY, JULY 14th, 1910, for

40-ft. Concrete Bridge.
15-ft. Concrete Bridge.

both to be built on the town line between the Townships of Eramosa and Erin. For further information apply to the engineers.

BOWMAN & CONNOR,
36 Toronto St., Toronto.

27

City of Belleville

Waterworks Pumping Plant

Sealed tenders endorsed Pumping Plant will be received by the City Clerk up to 20th JULY, for the following pumping equipment:

A. Two turbine pumps, direct connected to proper motors, with lightning preventive apparatus, and starting apparatus.

B. Two triplex pumps, also direct connected to similar motors and apparatus.

Note,—Equipment to be installed by contracting company. Each pump to have a guaranteed capacity of 1,000 gallons per minute against a head of 240 feet. Three phase alternating current, 60 cycles, 2,200 volts. Supplied with water meter.

Further particulars can be obtained on application to the undersigned.

The lowest or any tender not necessarily accepted.

JAMES G. LINDSAY,
City Engineer.

Belleville, July 4th, 1910.

Sealed Tenders

will be received by the Secretary Treasurer for the Town of Yorkton, Sask., until 6 p.m, JULY 12TH, 1910, for the following:

Contract No. 1.

Construction of a Sewage Disposal Works for the Town of Yorkton.

Contract No. 2.

Construction of the following sewers:

Approximately 2,900 feet of 20-inch sewer.
Approximately 3,200 feet of 15-inch sewer.
Approximately 1,700 feet of 10-inch sewer.
Approximately 2,800 feet of 8-inch sewer.

Contractors may tender on either or both of the above. Plans and specifications may be seen and forms of tender obtained, at the office of the Town Engineer. A marked cheque for 5 per cent. of the amount of the tender must accompany each bid. The lowest or any tender not necessarily acepted.

F, T. McARTHUR,
Town Engineer.

Town of Yorkton, Sask. 27

Miscellaneous

Advertisements under this heading two cents a word per insertion

FOR SALE.—A large quantity of galvanized steel, suitable for re-inforcement. Would cut to sizes to suit purchasers. Enquiries solicited GOOLD, SHAPLEY & MUIR COMPANY, Limited, Brantford, Ontario. 28

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 inch x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail —WM. LESSLIE, Walkerville, Ont. TF

Tenders for

Electrical Apparatus

for New Hamburg, Ont

Tenders will be received up to noon of MONDAY, 18th JULY, 1910, by the Municipality of New Hamburg, Ont., for

1. 13,200/2,200 volt transformers.
2. Switching apparatus.
3. Protective apparatus.
4. Street lighting aparatus.
5. Distributing transformers.
6. Maximum demand apparatus.

Full information may be had from the undersigned, or at the office of the engineer, Edward B. Merrill, 59 Yonge street, Toronto, where specifications, etc., may be had by bona fide tenderers.

WILLIAM MILLAR.
Town Clerk.

New Hamburg, Ont., 25 June, 1910. 27

Miscellaneous

(Continued from page 27.)

ling, St. Clarens, $8,000; T. Walker, 3 attached 2-storey brick dwellings, 1308-10-12 College street, $6,000; W. A. McConnell, 2 pair semi-detached 2½-storey brick dwellings, Margueretta street, $8,000; A. B. Coleman, 2-storey and attic brick dwelling, 108 Bernard avenue, $4,500; J. T. Smyth, 4 detached 2-storey, roughcast dwellings, brick fronts, Carlaw, $6,000; Home Bank of Canada, Alterations to office and bank, corner Bathurst and Bloor, $13,000; Chas. Blatchford, 2-storey brick dwelling, 11 Binscarth road, $4,500; H. A. Clark, 2½-storey brick dwellings, Foxbar road, $5,000; F. M. Tuckett, 2 detached 2½-storey brick dwellings, Woodville, $6,000; A. S. Rogers, 2-storey brick warehouse and stable, Antler street, $9,000; A. R. Clark and Company, 3-storey brick addition to factory and store room, Eastern, $5,000; P. Umbach, 1 pair semi-detached 2½-storey brick dwellings, 145-7 Denison, $5,000; Jas. Clark, 3 attached 2-storey brick dwellings, Edwin avenue, $6,900; Lewis LeGrow, 1 pair semi-detached 2½-storey brick dwellings, corner Manning and Palmerston, $4,500; W. Colwell, 1 pair semi-detached 2-storey brick dwellings, on 540-2 Lansdowne avenue, $4,500.

Victoria, B.C.

The contract for the supply of galvanized pipe will be let to the B. C. Hardware Company at $6.22 per 100 feet for one-inch; $10.70, two-inch; $14.30, two and one-half inch.

Vancouver, B.C.

Recent building permits include:

J. Crane, 2665 Fifth avenue west, two houses, $6,000; R. J. Potts, 1644 Balsom street, $6,500; R. D. Paterson, 1255 Thirteenth avenue west, $4,000; Lutheran Church, 431 Carl avenue, $3,000; D. C. Fulton, 3602 Second avenue west, $5,500; T. H. Calland, 1538 Yew street, apartment house, $10,000; F. J. Fisher, 736 Broadway, $5,500; W. J. Stuart, 52 Sixth avenue west, $5,500; Bank of Montreal, $65,000; Sixth avenue west, $3,700; Empire Supply Bentley and Weir, frame dwelling, 2555 Company, concrete hotel, 915 Westminster avenue, $57,000; R. H. McDonald, 325 Twelfth avenue west, $3,500; W. B. Moore, [illegible] Tenth avenue east, [illegible]; H. [illegible], [illegible] Fifth avenue east, [illegible]; Mrs. Sanford, [illegible] street, [illegible]; W. Tinney, 2632 Hemlock street, $8,000; J. C. Hawkins, Victoria drive, $3,500.

Winnipeg, Man.

Recent building permits include:

P. Olson, house, west side of Home, $2,500; J. Hewitt, house, west side Home, $4,500; W. A. Wilkie, two houses, east side of Arlington, $5,800; R. Longley, house, west side of McPhail, $2,500; A. C. Ewart, residence, Ruskin row, $15,000; Dr. Galloway, addition to house at 661 Broadway, $6,000; Ed. Noe, four houses, south side of Jessie, between John and Hugo, $12,000.

AWARDED.

Victoria, B. C.

Tenders for repairs of steamer Yucatan were as follows:

Union Iron Works, San Francisco, $170,000, 175 days.

United Engineering Works, San Francisco, $153,000, 150 days.

Wallace and Jenkins, Seattle, $133,250, 125 days.

British Columbia Marine Railway Company, Victoria, $125,000, 130 days.

Moore Iron Works, San Francisco, $122,500, 150 days.

Moran Shipbuilding Company, Seattle, $119,460, seven months.

Williamette Steel and Iron Works, Portland, $89,000, 140 days.

Kingston, Ont.

The Kingston Shipbuilding Company has been awarded the contract for building of a quarantine steamer for the Immigration Department, to be located at Grosse island, at $60,000.

New Companies

The Universal and Metals and Aluminum Solder Company, Limited, Quebec, Que., capital $100,000. Incorporators, H. Dussault, contractor, Levis; O. Turgeon, manufacturers' agent, Quebec.

The St. Lawrence Quarries Company, Limited, Montreal, Que., capital $100,000. Incorporators: J. W. Blair, F. J. Lavetty, advocates, both of Montreal.

The Continental Lumber Company, Limited, River Charlo, N.B., capital $100,000. Incorporators, J. E. Brochu, attorney, L. L. Maynard and A. Laberge, accountants, all of Providence, R.I., U.S.A.

The National Brass Manufacturing Company, Limited, Montreal, Que., capital $50,000. Incorporators, R. T. Heneker, K.C., A. H. Duff and W. S. Johnson, advocates, all of Montreal.

Western Canada Electric Company, Limited, Montreal, Que., capital $1,500,000. Incorporators, G. V. Cousins, accountant, and P. Brown, both of Montreal.

The Highland Telephone Company, Limited, Ruskview, Ont., capital, $2,500. Incorporators, G. C. McGibbon, Honeywood and Lennox.

Tarontorus Telephone Company, Limited, Sault Ste Marie, Ont., capital $5,000. Incorporators, R. S. Walker, C. Becker and A. Cameron.

The Rockwood Line and Stone Company, Limited, Rockwood, Ont., capital $40,000. Incorporators, C. Wilder, C. McNab, both of Rockwood.

The McAuliffe-Davis Lumber Company, Ottawa, Ont., capital $200,000. Incorporators, W. H. McAuliffe, A. G. Gill, A. M. Davis and M. E. Davis, lumber merchants, all of Ottawa.

J. P. Mullarkey, Limited, Montreal, Que., [illegible] bonneau, notary public, all of Montreal.

Plasterers' Work

There is considerable art in connection with the plaster industry, simple as it might appear to be to a number of people. Even in the simpler forms of plaster work there is demanded considerable knowledge, if the results are to be lasting, and the work prove in other respects satisfactory. We have outgrown the old time methods of plastering houses, where a lime mortar was all that was needed, and where the finishing coat was slaked lime, spread over the first coat as a complement to the job. Now we build in a hurry, and time is money to the contractor as well as to the owner of the structure.

To meet this changed condition there are quick-setting plasters and wall finishes, so that it is a matter of application and not long delays that confronts the plastering contractor. If he has a well trained force of employees, and has good material, there is nothing to bar him from securing and completing considerable work in his line, and that at a good profit. These two facts must be kept in mind, however, because they are of vital importance to the man who undertakes this portion of house construction. Now, we can plaster a structure almost as soon as it is under roof, and there will be no danger of any evil results where good materials and competent work has been done.

A Matter for the Contractors

The plaster manufacturers have so improved the quality of their output that it is simply a matter for the contractors to have the same applied with alertness and by good men, in order that there will be no delays in completing this portion of the work on any building. Our hard wall plasters for the first coat and finish are ready at hand, and with a sufficient knowledge of how they are to be applied, gives the plasterer ample opportunity that was not possible several years ago. It is not necessary to name any one or more brands of plaster for this work, as the makes are so well advertised that they can be had in any locality on short notice.

However, there are some points that should be understood by the plastering contractor, even though his previous knowledge be ample, that will not be amiss in making his work more satisfactory, and that will be helpful to those whom he may employ to carry out the details of the contract. Hard wall plasters contain more or less gypsum, which gives them greater strength, and also makes possible a quick setting, so that they are largely used in this age in quick construction work.

Trouble from Quick Setting

One of the primary causes for trouble is having the plaster set too quickly, not only on the walls, which is not the general complaint, but in the mortar box, which is often looked after by an inferior hand, is due to a lack of cleanliness. The same can be said of the tools that are in the hands of the operators themselves, which, from a lack of careful cleaning, will invite trouble for him. The gypsum contains myriads of small crystals, which, when they come in contact with old plaster, will rapidly multiply, thus forming a coat of plaster in either mortar box or on the tools, and will cause the plaster to become less adhesive, and will also obstruct the working of the same on the walls. Cleanliness in this respect is, then, of as much importance as it is in so many other undertakings that demand this rigid care if the results are to be good.

Then there is the danger of having too little water in mixing the plaster. The gypsum demands considerable water, from the very fact that the increasing number of crystals consumes so much moisture that the plaster drinks it up and this prevents the proper hardening or setting of the same on the walls. If the lath are too dry, where wood lath are used, they will naturally consume considerable water from the plaster, and this will do much to harm the proper setting of the same. It is cheaper in the first place to use only the best grades of wooden lath; those that are free from either bark or sap. Then they should be soaked for some time before placing them in position. Even when they have been nailed to the studding it is not a bad idea to sprinkle them just before applying the plaster. This prevents the wall from cracking, and gives the plaster ample moisture, so that it will set quickly and securely.

Every contractor appreciates the fact that the room which has been plastered should not be left open to admit draughts, rains or other means of preventing the plaster from getting a secure set. One of the primary objections to securing good results in plaster work is often due to a poor quality of sand, which has been the cause of a great amount of trouble. While there are rules for the quantity of sand that must be used in connection with plaster, there must be taken into consideration the quality of the sand; the poorer the quality the less to be used, as it has an evil effect on the plaster.

Where a plaster sets too rapidly a retarder can be used, which is easily obtainable from plaster manufacturers. The operator is guided in this matter by local conditions, and can soon judge of the exact amount required, as the directions are given for general cases.

For much work done now there are several coats applied, the first, or scratch coat, being of one part lime and four parts sand. This contains certain proportions of hair, as a rule being about one bushel of hair to 100 yards of plaster. After the first coat has dried sufficiently it is scratched and it is then in a condition to hold the second coat, which is applied, the same mixture being used, being brushed down with a coarse broom. The finishing coat is simple hard plaster, and is scarcely more than 1/8-inch in thickness.—"National Builder."

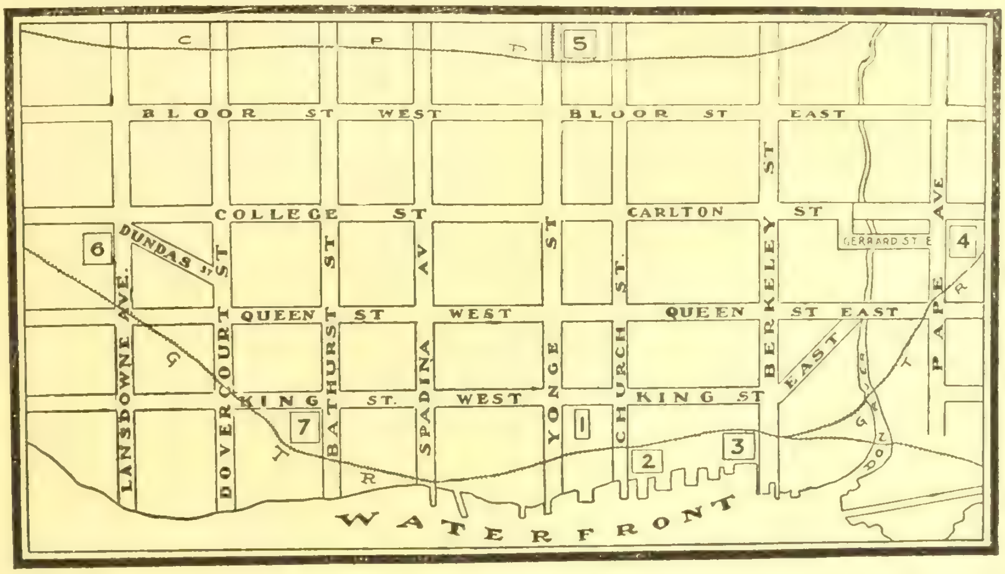
A Pompeiian House

A well known house at Pompeii (No. 39, in the second Insula of the 8th Region), named after the Emperor Joseph II., who visited it when first laid bare, a century ago, has been lately completely excavated. It is three-storied and of terrace construction, having been built against the steep side of the mountain. The upper storey presents the usual plan of a Roman house. A staircase of 28 very well preserved steps of Vesuvian lava, divided into three flights, or landings, leads to the lower floor. The topmost landing and the two upper portions of this staircase have wooden balusters; the lowest portion, which is also the largest, is vaulted over. Two very plain rooms, with rough walls, one of them having a hearth, open on to this staircase. At its foot there is a long passage leading to a back staircase, which again lead to the upper storey. Proceeding, however, straight on, the visitor will find himself in a court, or kind of peristyle, on each of two sides of which there are two chambers, the third side being occupied by a large room, most probably the triclinium, or dining-room. The fourth side opens on to a great terrace, from which the courtyard and the rooms are lighted. Beneath this terrace is the lowest storey, comprising the various offices, kitchen, bakery, mill, bath, etc. The bath consists of a tepidarium, a vaulted room, with a white mosaic floor, the walls painted yellow; a calidarium, also vaulted, the walls adorned with pictures on a red ground, the floor mosaic, the frigidarium, circular, as usual, having a cupola-formed vaulted room with an air-opening in the middle, furnished with a wide ventilating shaft of terra cotta.

P. D. S. a New Feature

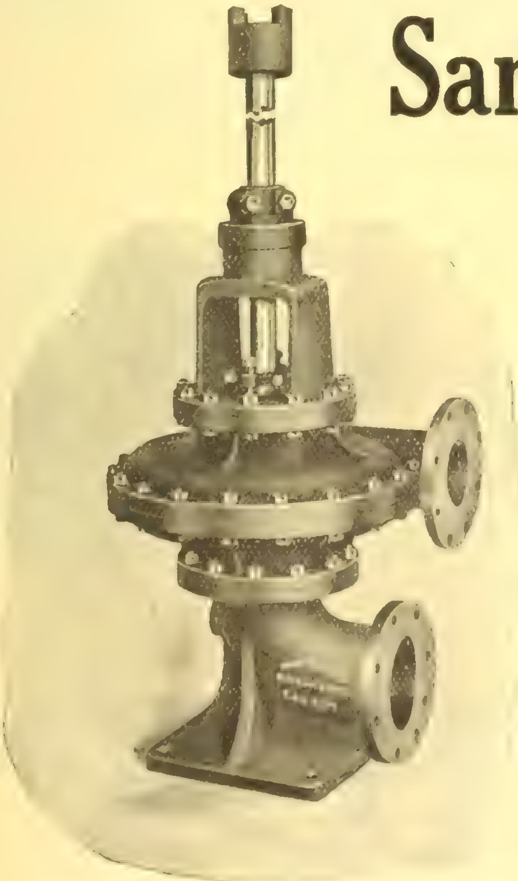
CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone Main 4 1 5 5 No's 2, 4, 5, 6



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

ROGERS SUPPLY CO., 3 King Street East, Toronto



Sand and Dredging Pumps

Specially adapted for handling

Sand Gravel and Clay in suspension

These pumps are built in two styles Submerged and Dry Pit in sizes from 4 to 14 inches discharge opening and are arranged for Vertical Motor Drive.

They have all the special features that have made the horizontal type so popular--split barrel, split packing gland, and extra heavy supporting bonnet.

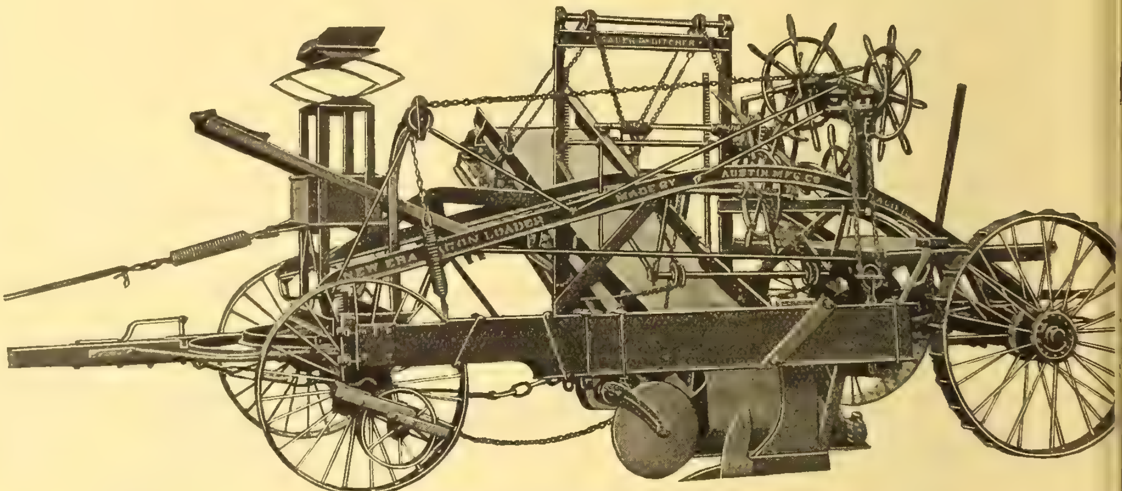
Easy to install -simple to operate—built for hard work.

Catalogue No. 200 on Request

The Waterous Engine Works Co. Limited
Brantford, Canada

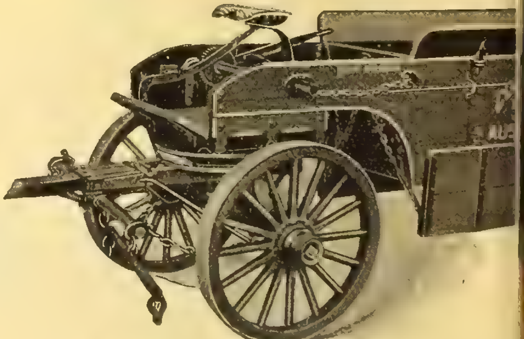
Elevating Graders

for Railroad Grading, Irrigation Work, Municipa
Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment



Austin Dump Wagon

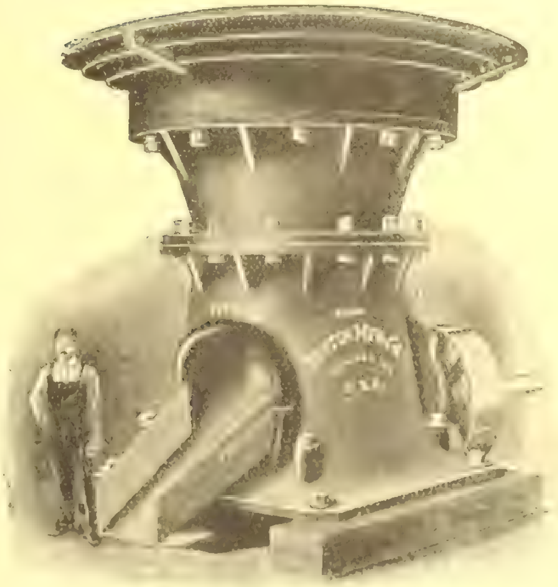
Head Offices and Warehouses :
Montreal

MUSSEN

mplete
Rock
Crushing
Plants

esigned and Supplied

Crushers
Elevators
Screens
Bins
Hoists
Derricks
Rock Drills
Drill Steel
Cars
Locomotives



Austin Gyratory Crusher

WRITE FOR CATALOGUES

LIMITED

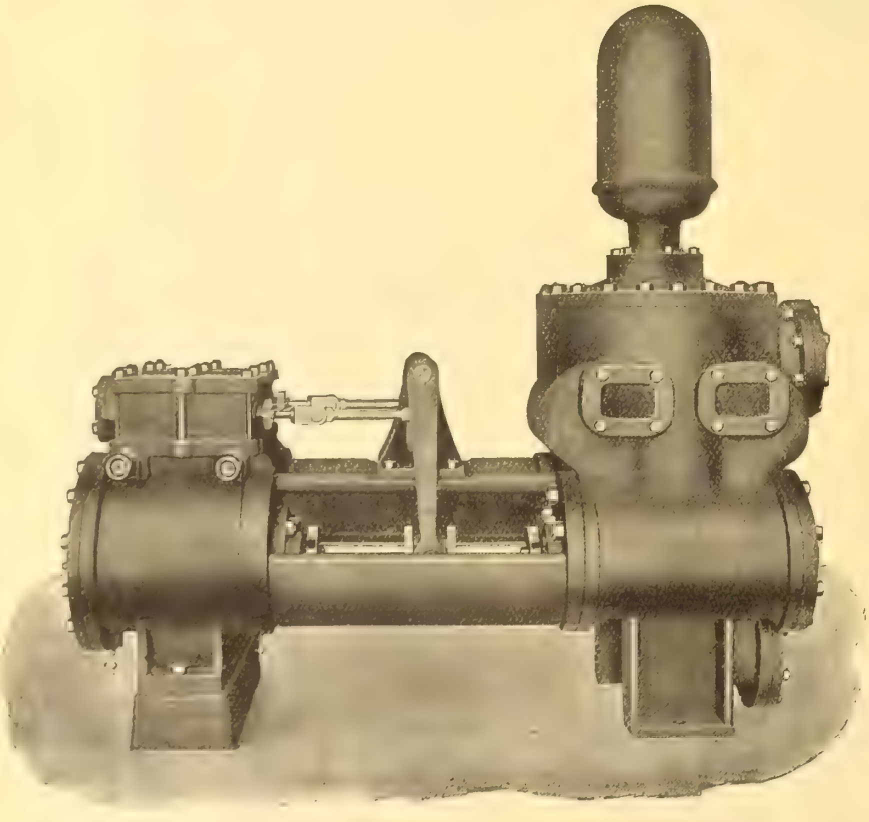
BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co.
Hamilton - Canada
Limited

Rounds, Squares,
Twisted Squares,
Maxwell
Deformed Bar

Bar Iron
Pig Iron
Forgings
R.R. Splice Bars
Tie Plates, Spikes, Axles

STEEL BARS
for Reinforcing
Concrete



The Blake Pump

STEAM PUMPS
FOR
BOILER FEED
AND
GENERAL SERVICE
CARRIED
IN STOCK

WORKS—MONTREAL

THE
JOHN McDOUGALL
CALEDONIAN IRON
WORKS COMPANY
LIMITED

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto July 6, 1910 No. 27

The Need of Skilled Workmen

The increasing difficulty experienced in obtaining properly skilled workmen to carry out even the ordinary tasks of the mason and carpenter is a matter that calls for something more than passing reference. The question arises: "What are we doing in Canada to meet the situation?" The facilities for technical education in even our best cities are very inadequate, and we are constantly receiving reminders of the urgent nature of the problem. The following is an extract from a recent issue of the "American Architect":

"Probably one of the most urgent needs in the entire realm of building is that of more skilled workmen or artisans. The dearth of competent mechanics in all lines of construction work is becoming a matter of grave concern. It is no longer possible to secure certain character of masonry or woodwork, due to the fact that mechanics who are qualified to undertake its production cannot be found. If a workman does not possess the requisite knowledge and skill there is no possibility of securing desired results from the use of materials under his hand. In time past the artisan has contributed almost as much to the final effect of buildings as the designer, and his assistance is sorely missed by the architects of to-day. Under present conditions of trade-unionism and the further art of deadening effect produced by the modern requirements of speed imposed on the majority of construction undertakings, there seems little hope of early improvement. And yet it must come if our work is to be restored in character to the average that obtained in earlier days, for example. Perhaps the vocational school offers a solution of the problem. At least it seems worthy a trial, and there can be no question but that an infinitely more independent and, beyond a doubt, a loftier career is open to the thorough artisan, than to a clerk or small tradesman. We shall hope to see more emphasis laid on the importance and value of a vocational training for young men."

Responsibility of Architects and Engineers

There is a pronounced tendency to be observed in many directions to withhold authority from architects, engineers and others, while demanding of them that they assume full responsibility for the outcome of the work in charge, says the "Improvement Bulletin." A recent instance occurred in Tacoma, where the city engaged a responsible engineer to undertake the construction of a hydro-electric plant. The arrangemen twas that he should have full authority to engage his engineering assistants and fix their salaries, subject to the approval of the Public Works Commission. Further, the arrangement was not to be cancelled without a two-thirds vote of the city council. A stipulation was included that the engineer was to be retained until the completion of the work. A change of the municipal administration brought in a new set of officials, who promptly demanded that the control of the work was thereafter to be with a commissioner, and also demanded that the engineer accept a reduction of salary to half the former figure. The engineed showed his appreciation of his position by refusing to accept any such conditions, feeling that the responsibility for the work demanded that he have the authority. His attitude will appeal to most people as quite logical and reasonable. The council had the governing power retained to prevent making the work different or more expensive than was planned. But the real responsibility rests upon the engineer, and should it prove a failure, it is upon him that the blame falls. Under such circumstances, he is entitled to have control.

The Galt "Reporter" protests against the builder who "improves his property without regard to the depreciation he is responsible for in surrounding properties." The journal further adds: "Irregular lines are destroying the beauty of some streets, and individual owners are being injured by the haphazard methods employed in the construction of dwellings. We seem to have got away from safe methods of construction, and in some cases too little attention is paid to harmonious lines in the filling up of vacant lots with modern houses." It is very gratifying to find this trend of feeling in Galt. The next thing we may expect from the town, judging by what we have seen elsewhere, is an advertisement calling for the preparation of an expert improvement scheme at an outlay not exceeding $25.

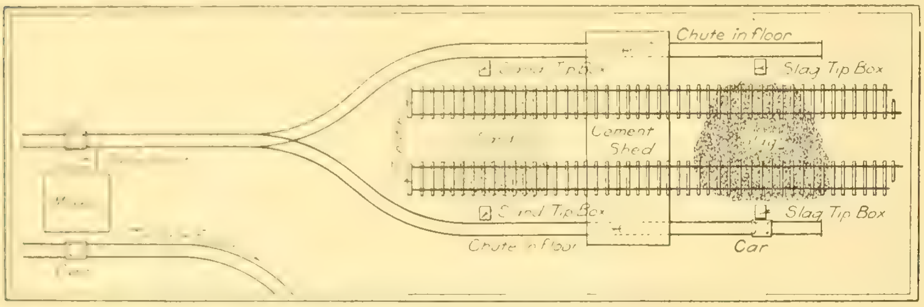
Fifteen hundred union bricklayers and stonemasons at Montreal have gone on strike for a graded scale of wages and recognition of the union.

Reinforced Concrete Dock, Detroit, Mich.

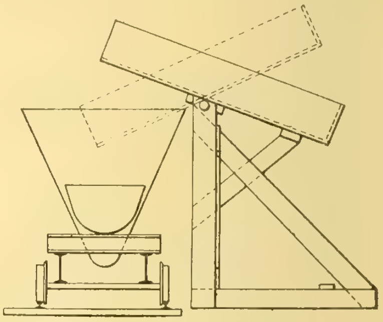
Special Features of Design and Construction — Entire Weight, 6,800 per Square Foot, Carried by Piling — Economical Arrangement of Work

A reinforced concrete dock and ore floor have recently been completed for the Detroit Iron & Steel Company, at Detroit, Mich. The dock proper is the outer portion supporting the main tower of the ore bridge, and consists of two I-shaped girders running parallel to the river and spaced 28 feet apart, intersected by 10 x 54-inch beams spaced to 10 feet on centres and carrying a 6-inch slab designed for a live load of 100 pounds per square foot. The girders were designed for a maximum load of 138,000 pounds on each leg of the ore bridge tower, the load being transmitted to the girders through a four-wheeled truck having an 8-foot 6½-inch wheel base. The bases of the girders are 5 feet wide, webs 16-inch thick, height over all 9 feet. Each girder rests directly upon two rows of oak piling 12 to 16 inches in diameter, 40 to 45 feet long, driven to refusal. The tops of the piles project 9 inches into the concrete girder, the bottom of which is 6 inches below water line, thus keeping the piling always under water.

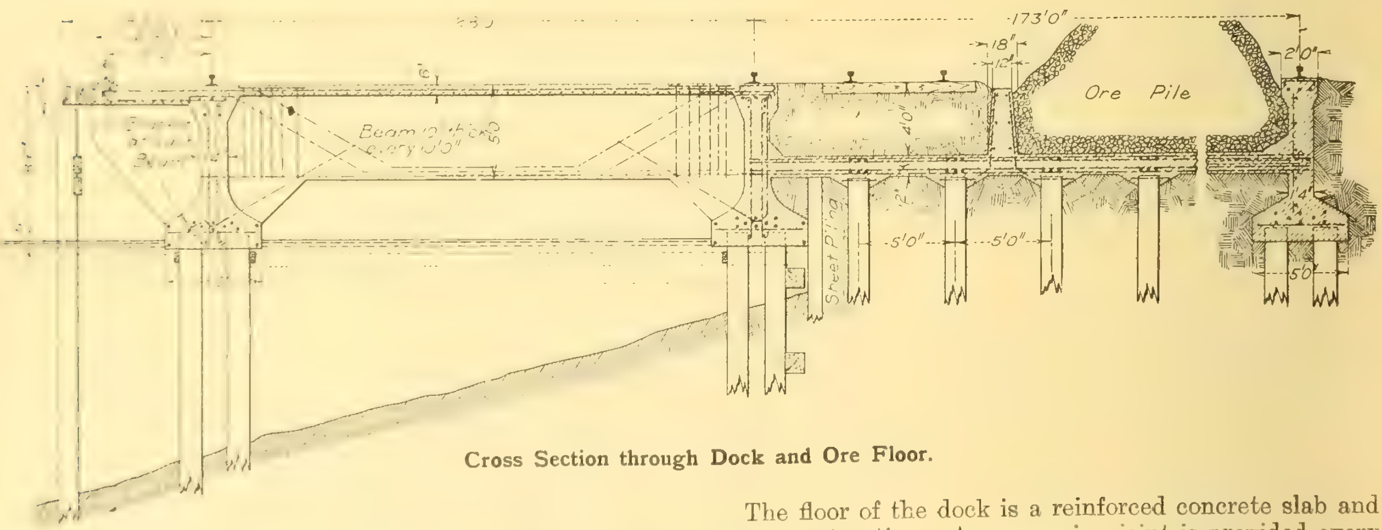
The slab is increased to 12 inches thickness outside the outer girder and is reinforced to withstand the horizontal and vertical thrusts from boats. The floor beams are continued through the outer girder and extended to form a bracket, the reinforcing bars bending up at the girder and extending out into this bracket near the top to take care of the cantilever action. These brackets are 10 inches thick, except at the mooring cleats, which are 50 feet apart, where they are made 16 inches thick. The mooring cleats are anchored by two 1¾-inch round bolts 2 feet 3 inches long. The tracks for the ore bridge are 100-pound rails, held in place by ¾-inch bolts 12 inches long staggered 12-inch centre to centre. These bolts project 2¼ inches above the concrete to receive cast iron rail clamps. The face of the dock on the water side is protected by a row of piles driven entirely free of the dock, being placed about 9 inches clear of the concrete, so that the impact from the boats will be taken almost entirely by them. Above this piling and bolted securely to the concrete are two rows of 6 x 12-inch waling timbers. These timbers are separated from one another and from the dock at alternate points by 3-inch blocks, thus giving an extra safeguard against damage by vessels.



Material Storage and Concrete Plants for Building Dock and Ore Floor.



Sketch of Tip Box



Cross Section through Dock and Ore Floor.

The floor of the dock is a reinforced concrete slab and beam construction. An expansion joint is provided every 50 feet, making four separate sections, the total length of dock being 200 feet. The dock proper is tied in with the ore floor at every cross-beam with a 1½-inch square twisted rod 25 feet long.

A special feature of this type of dock is the location of sheet piling at the inner girder of the dock proper, thus allowing the natural bed of the river to come within a few feet of the base of this girder, and giving a minimum overturning moment due to the earth under the ore floor.

The ore floor was built over low, marshy ground covered at times with 6 to 12 inches of water. A girder at the rear edge of the floor supports the rear tower of the ore bridge. The ore floor consists of a 12-inch slab resting directly upon 12-inch piling, 35 feet long, spaced 5 feet centre to centre both ways. No allowance has been made for the earth under the floor taking any load whatever, the entire weight, amounting to about 6,800 pounds per square foot, being carried by the piling. The top of the ore floor is dropped 4 feet below the top of the girders, thus increasing the capacity about 7,400 tons, the total capacity being approximately 245 tons per lineal foot of floor, which is 200 feet long. The earth at the top of each pile is excavated to a depth of 10 inches, forming a shallow, funnel-shaped collar, in which is embedded a ring of 3/8-inch round steel rod, 18 inches in diameter, placed 3 inches below the top of the pile. The slab is reinforced by three 1/2-inch square twisted bars over each pile in four directions, at both top and bottom, making 24 rods crossing at every pile. Over the piles the rods are well wired together to avoid spreading, while steel separators are placed between the two layers at intersections between piles, thus ensuring proper placement of steel rods as near the surface as practicable. This arrangement was adopted in order to give a rigid and strong network of steel with sufficient concrete to develop its full strength.

The girder at the land end of the ore floor, supporting the rear tower of the ore bridge, is similar in form to the other girders, but is especially reinforced to withstand the thrust from the ore and is tied to the ore floor every 10 feet by a 1 1/2-inch square twisted rod 15 feet long, in addition to floor rods, which extend well into the girder. A portion of the ore floor just behind the dock proper is filled in and a railroad track is run on it for the full length of the floor. The small retaining wall at the inner side of this fill is 12 inches thick at the top, 18 inches at the bottom, 3 feet 6 inches high, and is reinforced with steel rods on both sides.

At the connection of the new dock with the old a 12-inch wall about 4 feet high is built and well anchored to both docks.

A drawing gives the lay-out of the mixing plant and stock piles. The sand, slag and cement were brought in on a double trestle about 20 feet high, in hopper bottomed cars, which were dumped directly over the stock piles; the cement was received in cloth sacks in cars and unloaded directly into chutes leading to the cement shed, where it was piled in separate car lots, which were not disturbed until released upon receipt of a satisfactory report of the cement tests. The mixer was located about 50 feet from the stock piles and was fed by two 1-yard wide dump cars, dumping directly into the loading skip of the mixer.

The material track branched to both sides of stock piles, where tip boxes of suitable size were placed in such a manner as to permit of their being loaded while the material was on its way to the mixer to be dumped. The empty car was run to the loaded tip box at the slag pile, received the slag, and was then moved to the chute under the cement shed, where the cement was dropped in. It was then pushed to the sand tip box and on to the mixer. This proved to be a very simple and economical arrangement. The mixed material was dumped directly into end-dump industrial cars and hauled to the form work over tracks slightly elevated above the ore floor.—Engineering Record.

Town Planning and Improvement Schemes

A Consideration of the General Principles Width and Classification of Roads Buildings in their Relation to Town and City Development

By R. H. HAYNES, M. Inst. C.E.

It is not proposed to discuss the question of the proper person to prepare a town plan. The writer is one of those who hold the opinion that a complete and satisfactory town plan must be the work of many trained minds each laboring in his own proper sphere. Art, architecture, engineering, forestry, landscape, and finance should receive consideration in due relation one to another. A rational and effective town plan cannot possibly be a cheap production. Nastiness will inevitably accompany parsimony.

The Preparation of the Extension Plan

The first question to be decided is the area to be included, the second the basis on which the plan is to be prepared, i.e., is it to be a general idea plan or shall it comprise the complete development of the projected area?

As to the area to be included, it would appear reasonable to look thirty years ahead and to incorporate any land, whether within or without the town boundaries, which may be used for building purposes during that period. In separate jurisdictions the matter of joint or several action on the part of the local authorities must also be settled beforehand.

The writer favors the general idea plan on the ground that there is a reasonable prospect of forecasting with accuracy the general trend of development and of defining the lines on which such development may legitimately and properly take place which cannot apply to a plan for a complete lay out.

The general or primary plan should comprise all main lines of communication, arterial roads, bridges, means of transportation, secondary traffic roads, places, open spaces or parks, and once fixed, its outline should not without very good cause be departed from. If it be possible to arrange the area to be set aside for manufacturing purposes so much the better, though there will certainly be difficulties ahead with respect to this.

The subsidiary or secondary plan may be prepared in sections from time to time as the necessity arises, and this plan, or the sectional portions thereof, should provide for a proper development of individual owners' lands in accordance with the prescribed regulations and with the minimum of rearrangement of the boundaries.

It may be regarded as an axiom that the general plan should take into account existing through routes from town to town or county to county, and that arterial roads should be so planned as to connect with any new routes which may be projected or undertaken under any development act or scheme.

Furnished with a general plan, properly contoured and with the different ownerships shown, the development of the scheme may be proceeded with.

There is no royal road to success. Knowledge, ability and experience are the only guides. The following points

---

*Extracted for this journal from a paper read before the Incorporated Association of Municipal and County Engineers.

should be kept to the fore. Do not disregard existing divisions between the lands of different owners, although these should not be slavishly followed if they interfere with correct development. Bear in mind all natural features worthy of preservation. Do not destroy trees. Let your main arteries have moderate gradients. Be particular to follow the contours so far as this may properly be done. Chaotic confusion, failure, and great waste of money must result if the physical configuration of the area be ruthlessly disregarded.

A very excellent general direction is that contained in the Swedish Act relating to town plans. "The town plan must be prepared so as to ensure, as far as possible, that the requirements of traffic, in respect of ample space and convenience, shall be supplied; that the light and air needed for health shall be provided; that the danger from fire shall be guarded against; and that there shall be open spaces, the variety of construction and the beauty necessary for æsthetic reasons."

Does not this sum of the whole art of town planning?

Width and Classification of Roads

The road problem is the most debated of modern times. The motorist on the one hand clamors for wider and more costly roads, the town planner, on the other hand, urges a minimum width in subsidiary roads and a general reduction in the cost of road works. Both views should within limits prevail. Arterial traffic roads must be of ample width, well constructed to resist the destructive effects of modern locomotion. Subsidiary roads may be laid down in the most economical form for the traffic they have to bear. Bad formation can only result in large maintenance costs, a danger which must be guarded against.

If ample space be provided between buildings and set aside for public necessities, the road width can, in the first instance, be adjusted to the current traffic, and if found necessary in the future it can be increased so as to provide for a more intense circulation. This is putting a fair share of the ultimate cost on the future users and relieving the landowner and the real bearers of the burden, the householders, from unnecessary expenditures in the present.

There is much to be said for the continental system of multiple track roads. The general adoption of this method in main arterial roads would have an extraordinary effect on transportation methods and costs. If tramway tracks were placed in a special place reserved for tramway traffic alone, the initial expenditure on track construction might be reduced by one-half, and the maintenance rendered far more simple and much less expensive than can possibly be attained in the present systems of location and construction.

In purely residential roads the width need only provide for two lines of traffic, but the formation must withstand modern motor traffic, though the destructive motor lorry should be excluded by legal authority. In some cases nothing more than a carriage drive would be required, though the position in relation to future requirements must be safeguarded.

Some one must pay for roadworks, the cost of which is invariably added to the building values. Excessive road expenditures result in largely increased rentals. Wide paved boulevards and cheap houses cannot exist side by side.

Buildings in Their Relation to Town and City Development.

Apart from traffic considerations, roads are but a setting for the buildings adjacent to them, and it is of importance that the grouping and architectural treatment should be well considered and only really effective buildings erected.

Three-fourths of the recent building work in this country does not rank as architecture at all. The utilitarian has been given far too free a hand, and it is to be regretted that architects in general have not realised the potentialities of and seriously taken up the planning and design of the smaller class of dwellings.

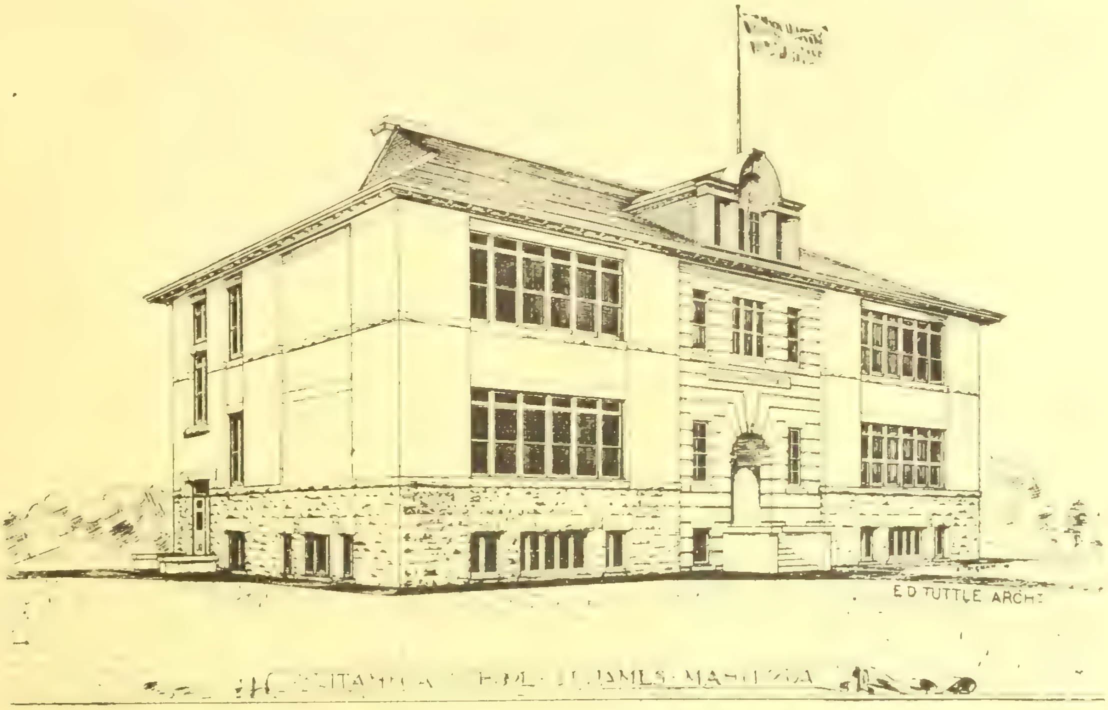
Heating a Shop through the Floors

No steam or hot water, no heating coils, no hot air registers—the absence of these devices for heating a shop is the engineering feature of a modern industrial plant, reported in the "American Machinist." The exterior walls of the buildings of this plant are either of concrete blocks or monolithic concrete, in which the aggregate is crushed stone, a native slate quarried on the spot in preparing the foundations.

A system of 1-inch wrought iron pipe was laid in the floor of the new pattern shop and connected back to the drip from the glue pot by a suitable system of valves. This system was put in with two ideas. A section of heated floor space would be of service in drying out the built-up wheel pattern sections after they had been glued; at the same time, it was believed that the arrangement would serve as a satisfactory way to heat the shop. This shop was a roofed-over court between two main buildings. Aside from the heat which would be communicated to the floors from the system of pipes, no other provision was made for heating the room, except to make a few openings whereby air from the plenum of the main shop could enter. This experiment was successful.

The new plant which this same concern has recently erected has offered the opportunity for a trial of this novel system of heating an industrial plant on a scale large enough to grasp its real worth. Three modifications of this system of heating through the floors are in use in the new plant. The pattern shop is heated by exhaust steam traversing wrought iron pipes laid in the concrete floor. The main machine shop is heated by hot air, forced through a system of supply and return ducts built in as part of the concrete floor structure, and the blacksmith shop is heated by a circulation of hot flue gases through a system of tile pipes buried some little distance below the floor of the shop. The pattern shop system is that of the simplest installation and more directly follows the successful experimental system at the old plant.

The pattern shop building is some 80 feet long, 22 feet 8 inches wide, and has a cubical content of 32,250 cubic feet. The walls are of monolithic concrete; the roof is of 3-inch plank, covered with composition roofing, and the building is isolated, except for the southern end, where it joins a lumber-storage and a pattern-storage building. Along the western wall is a 3-inch exhaust steam supply main; 1-inch pipes tap from this main run across the building, turn and run parallel with its length for a distance of about 5 feet, then turn again, cross the building again and enter a 2-inch return main that runs the length of the building on the same side as the supply main. The 3-inch supply main is at a level of about 1 foot above the floor. The total amount of radiating surface is 310 square feet, distributed as follows: Eighteen 1-inch pipes, 28 feet long, 161.4 square feet of surface; nine 1-inch pipes, 5 feet long, 15.5 square feet of surface; one 3-inch pipe, 84 feet long, 80 square feet of surface; one 2-inch pipe, 84 feet long, 52.5 square feet of surface, giving a total of 309.4 or, say, 310 square feet of radiating surface.



Britannia School, Winnipeg, Man.

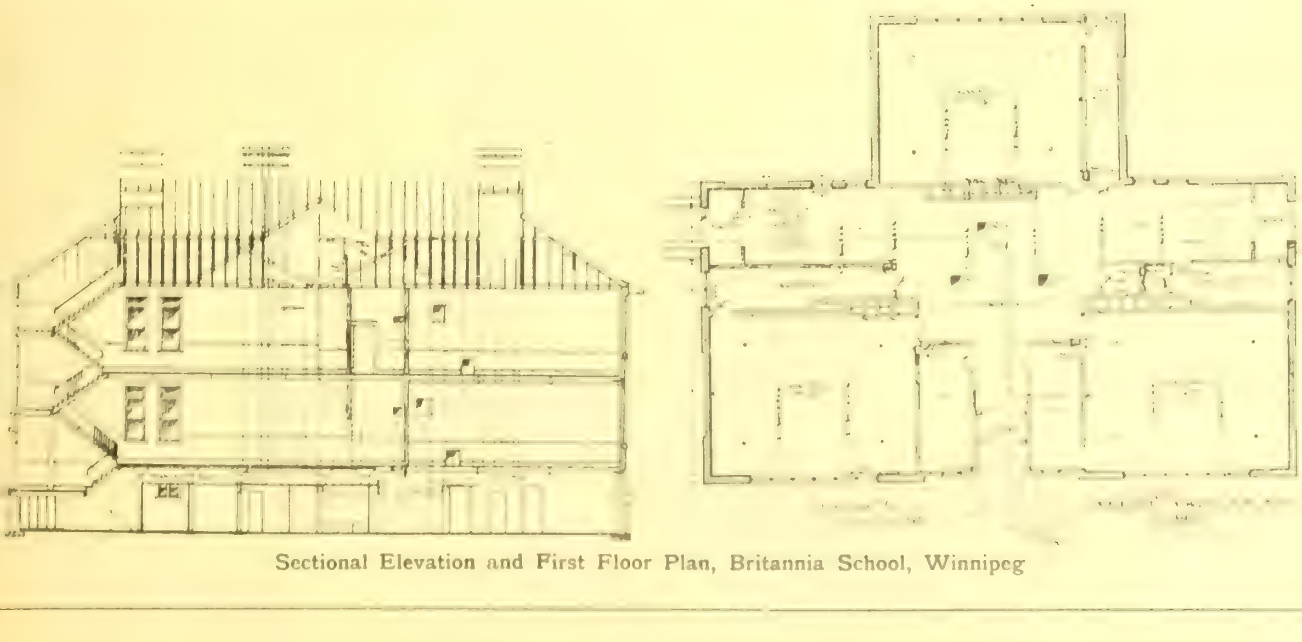
The building illustrated is being erected in St. James, a rapidly growing suburb of Winnipeg. It was designed by Architect E. D. Tuttle, of Winnipeg, who has made school and public buildings a study and has been very successful in combining good design with economy.

The building is placed 90 feet from the street and faces the west; it has a frontage of 93 feet 6 inches and a depth of 73 feet, and is two storeys and basement in height. The lot being over 600 feet long, the building is placed in the centre, and thus presents a good perspective.

The exterior of the building will have a pleasant effect, with the stonework carried to the bottom of the windows on the first floor. Above this the building will be of pressed buff brick with white panels.

As this building will eventually become a city school, particular attention has been paid to the requirements of the Board of Education. The classrooms are so arranged that all light is admitted at the left side of the pupils. The general layout of the building is such that four additional rooms may be added at a future time when required, by replacing the windows in the halls with doors. The design is for a six-room school, and when the additional four rooms are added they will not interfere with the general arrangement of the halls and the new rooms will have all the advantages of the first six.

The halls are large and amply lighted. There are three well located entrances and two convenient stairways. The basement contains play rooms for the pupils; the boys are divided from the girls by doors hung on an overhead



Sectional Elevation and First Floor Plan, Britannia School, Winnipeg track and so arranged that they can be shoved around as indicated, thus joining the two play rooms, making a large assembly room. There are two commodious store rooms for seats, storm sash, etc.

The heating and ventilating system is that known as the gravity system, with three Pease-Waldon furnaces placed close to vertical stacks, and so arranged that they are all fed from one room, which is entirely surrounded with fireproof walls, as well as fireproof ceilings and floors extending over all the furnaces, thus affording a good fire protection. In addition to this, there will be placed in the furnace room one automatic fire alarm, which will be connected to electric bells in each classroom.

On the first floor are three classrooms with cloak rooms, teachers' toilet and cloak rooms, and principal's office. On the second floor are three classrooms with their cloak rooms, library and store rooms.

The contract for the entire work has been let to Messrs. Hodgins & Thompson, of Winnipeg.

Concrete Building Erected in 118 days at Vancouver

Something like a record for speed of construction has been established in the erection of the Manufacturers' Home building, Vancouver. The structure was put up from the water's edge to a height of 103 feet in 118 days. There are about 14,500 square feet of floor area per floor. The floors are designed to carry a live load of 175 pounds per square foot, the concrete slabs being carried on shallow concrete beams and girders, which are in turn carried by hexagonal columns heavily reinforced to cut down their sizes to a minimum. The entire floors were finished as the work progressed from floor to floor and were immediately covered with lake sand to protect them from being marred. The building piers rest on clusters of piles; the largest columns in the basement are 28-inch hexagons; the smallest columns in the last storey 10-inch square .

Frost Proof Brick

Of all qualities that brick should possess none is of greater importance than the ability to resist the disintegrating action of frost, and since a frostproof brick generally is also able to withstand a great external exposure with safety, it is desirable to devote a little time to this subject, said Robert Niedergesaess, of Seattle, before the State clay makers.

Frost, as we know, is one of those powers which we cannot restrict in its action; water will begin to expand when its temperature drops below 39½ degrees F., and if confined and frozen will even burst a gun, yet a brick properly made will not be injured by it.

A soft-mud brick is on the whole more frostproof than a stiff-made brick, and of the latter kind, one made of mild sandy surface clay will stand more frost than another made of rich, strong clay such as prevail in the Puget Sound country. The reason for this difference lies in the lamination which the stuff-mud process has to contend with. The stiffer the brick are made the more they are liable to be laminated, unless the greatest care is bestowed upon the mixing of suitable ingredients, which prevent the clay from slipping through the die in layers. A soft-mud brick is somewhat elastic and spongelike in texture, whereas a stiff-mud laminated brick offers between its layers too much resistance to the expanding and freezing water. I am speaking of brick equally hard burned and have in mind a well made stiff-mud machine brick made in the 'sixties, that later on I saw going to pieces by peeling off in layers whereas a less nice looking old hand made brick remained as good as ever. That experience taught me the necessity of mixing the clay with enough rough and gritty material, and now I can safely say without fear of contradiction, that of the many millions of sewer brick, made as indicated, and used in Seattle sewers none has ever shown any signs of disintegration. By the way, I will mention that many of them were found to stand a pressure of from 5,000 to 15,000 pounds per square inch.

There are no mechanical contrivances which prevent lamination of brick made without proper mixing and working of suitable ingredients.

Improvement of Clay Products

By Anton Berg, Toronto

Every low grade brick, poorly made and poorly burnt, is hurting the clay interests. The plea that at the prevailing low price it is impossible to manufacture good brick, will not hold, and it is simply the old case of the "survival of the fittest." This will mean either the improvement and better operation of the clamp kiln, or its replacement by better types. If the undisputed excellence of brick as a building material is to be used as the principal argument for its advancement, we must not vitiate it by offering inferior products when better grades can be made at the same cost. Here again the question of educating the public comes into prominence, for if we show what good brick really mean, they are bound to find appreciation. If we aim, for instance, to sell no brick which show a water absorption of more than 15 per cent. by weight, and let people know about it, a standard of strength would be set with which concrete would find it difficult to compete.

I do not raise any argument or discussion against the statement that brick and steel construction is the best for some purposes. It certainly is convenient and profitable, not only to the owner, but to the insurance underwriters. Is this the important point? I hope not. The 20th century, conscientious man must strive for righteousness for fellow men in future generations. I have repeatedly asked: Who is responsible? Who will be responsible for the collapse when it comes? I believe the fire underwriters will not be responsible for the catastrophe to thousands and thousands. The narrow base, the unreasonable height, the vibration from storms through the years, the salt water atmosphere! This problem continually standing before us is a serious one, needing our honest and incessant study. We must cooperate in the right direction for the clay interests, that we may erect structures for all generations to dwell in without fear of collapse.

Three Rivers, Que., recently celebrated the second anniversary of the great fire that wiped out its business section. The work of rebuilding the burned district has progressed steadily, and the Three Rivers of to-day is a most promising town. There is only one jarring note and that is the dilatoriness of the Dominion authorities in not rebuilding the Government buildings. Apart from erecting a temporary building for public offices at Three Rivers the Ottawa Government has done nothing in this connection.

The Port Arthur carpenters, numbering 500, who recently went on strike for 40 cents an hour have returned to work at this figure. They have conceded "open shop" to the contractors.

Road Construction and Maintenance

Road Commissioner Frederick Gilkyson, of New Jersey, finds it desirable to treat the roads of that State on two general principles; one being to produce permanent improvement where the funds will permit, the other being to temporarily treat roads where sufficient funds are not available to permit of more permanent improvement. He realizes that work of the second class may lead to criticism, in that the work done may need to be gone over again every year until the road can be permanently improved; but it would appear that where permanent improvement is not possible such temporary improvement is far better than nothing at all, frequently saving the roads from utter ruin, which might come to them before rebuilding was possible. One method of so treating well worn macadam roads is to apply a thick asphalt oil mixed with sand. This makes a cushion similar to rubber and comfortable for horses, and also holds crumbling stone roads together. The sand unites very rapidly with the oil, but it requires some travel on the road to perfect the binder. Piles of sand are deposited by the roadside to be sprinkled over the surface whenever and wherever the oil shows itself there.

Reports of the road supervisor show that it costs about $350 per mile to fill up ruts and depressions in worn macadam roads with loose stones. The sand oil method costs between $600 and $700 per mile, but gives a far more satisfactory job and is expected to wear for at least two years. Resurfacing the roads by mixing asphalt, sand and stone costs from $6,000 to $8,000 a mile.

The Main Roads of Hampshire, England

A long and interesting report has been prepared by Mr. W. J. Taylor, the county surveyor of Hampshire, and submitted to his council respecting the present condition of the main roads under his control. The report is in sections, and deals with the class of material used on the various roads of the district. He points out that although the quantity of superior metal has been increased from year to year, there is, owing to the increasing traffic, but a small margin even under favorable conditions of weather between the quantity of metal applied to the roads and that lost by wear and tear; it therefore becomes imperative that it should be used to the greatest advantage by carefully supervised, efficient, and promptly applied labor. For the coming year it is proposed to use on the main roads in the county 10,265 tons of Clee Hill basalt, an increase of 8,271 tons over the year just ended; 19,910 tons of Cornish granite, an increase of 2,622 tons; 9,540 tons of foreign granite, a decrease of 7,389 tons; a net increase of hard stone amounting to 3,504 tons, while 41,360 yards of flint and gravel will also be required, an increase of 380 yards, so that altogether something like 600 miles of roads require 80,000 tons of material to keep them in repair for one year. In 1900 there were used for each mine or road 115 tons of metal, of which only five were granite or similar hard stone; next year 150 tons will be used, of which exactly half will be hard stone. To help the life of the roads, tarring is carried out which, during last year, cost the county £712, and during the coming year £1,000 will be expended in the same way, so that altogether it will be seen that the increased wear of the roads in the county in ten years has been very large

Roadwork at Hamilton, Ontario

City Engineer Macallum, of Hamilton, writes us as follows:

Outside of asphalt pavements, which we are laying ourselves, and expending $200,000 thereon, we are also laying ordinary macadam roads on several of the city streets, spending $30,000 on this work, and which amount of road work will more than keep us busy during the present season.

We are not laying any tar-macadam this year, neither have we so far this year been laying macadam mixed with asphalt oil, although probably in the course of the next couple of weeks we will probably use this oil macadam, as we have found it very satisfactory as a dust preventative. The oil used is Kentucky oil, having asphalt base, applied hot by means of an ordinary street sprinkling cart.

The macadam pavement was practically put in place and rolled, after which the sprinkler went over the road, covering the surface pretty closely, after which sprinkling of stone dust was put over the road so that the roller could be used for rolling this in and to prevent picking up the road by the roller. The results have been very satisfactory.

Road Grading

Highway Engineer Arthur R. Hirst, of the Geological and Natural History Survey of Wisconsin, anent the grading of roads, says:

"For grading work of any magnitude it is necessary to secure the services of an engineer, as his grades will save many times their cost to the township in showing just where to cut and where to fill. Don't let the fact that you have not money enough to grade the hill to 6 per cent. stop you from doing anything on it. Take off what you can, and do the rest when more money is available, being always careful to so arrange the work that no dirt will be moved twice in reaching the desired grade.

"When it is impossible to grade a road properly on account of lack of funds, as little money as possible should be wasted upon it until the time comes when money is available to cut it to the proper grade. About all that can be done is to maintain a high crown on the road with the drag and make the water travel in the ditches.

"In cuts, the bank should be cut back to a slope of 1 to 1 to prevent caving. In building new roads slopes should be cut back as far as possible within reasonable limits of expenditure. It is better to move the dirt when the equipment is all on the ground than to come back time after time to clean the banks.

"On every steep hill, or on soil easily washed, the ditches should be paved with stone, for a width of 3 feet or more. No breaks should be tolerated in the road itself. They should be placed in the ditches in which the water will flow if the roads are crowned properly. On steep grades, whether the gutters are paved or unpaved, small dams of rock or concrete should be placed across the gutters as often as made necessary by the eroding action of the water. These dams should be made lower in the centre of the ditch than at the sides and should be provided with an apron of concrete or stone on the lower side on which the water will fall

These dams if placed often enough, will prevent wash, as the force of the water is expended at the dams and not in the gutters. Such dams are inexpensive when stone is convenient and should always be placed on grades of over six per cent.

"Fills should be built with side slopes of not more than 1½ to 1, and the less slope the better. Whenever possible on hills, water should be turned away from the road through culverts or bridges, and should never be carried across the road in open ditches. All water should be turned off the road at the top of hills to prevent it from washing the ditches off the hill itself. On side hills a furrow or two at the top of the bank and running to the gullies will prevent the surface water from running down the side slopes and getting to the road. They should always be built when possible."

Use of Bituminous Binders

The practical value of the various forms of bitumen which have been most generally used and known, has been demonstrated, and there is more of a feeling of assurance of favorable results in their employment than has previously existed, says "Good Roads."

The fact that some bitumens have been reported as having given unsatisfactory results in some localities and under some conditions, is counterbalanced by the excellent results found under other conditions. It is a safe proposition, therefore, that the use of bituminous materials per se, is in accord with the methods of construction calculated to produce satisfactory road surfaces.

The greatest difficulty which has so far been encountered is in the formulation of adequate specifications for these bituminous materials. Nearly every highway department has prepared such a specification, and in addition to these, there are a number of others prepared by engineers and contractors. These all vary somewhat, but, so far as returns have shown, each of them defines a product suited to the requirements of the locality in which it is used. As a whole, it may be said that in spite of the little that is known about the factor of permanence, the immediate results are usually satisfactory, and the oldest constructions are in such a condition as to give promise of satisfactory service.

Opinions differ as to the method, whether by penetration, forming a bituminized macadam surface, or by mixing, thus producing a bituminous concrete, of which a wearing surface should be made. Many engineers seem to favor the latter, except for the fact that it costs more.

As between tars and asphalts, or asphaltic oils, each has its champions among the highway engineers, and there are many miles of excellent highways within a radius of a couple of hundred miles from New York, where each can be found producing satisfactory results.

The bitumen-bound surface gives evidence of growing popularity; and an important factor in its favor seems to be its influence on the dust problem.

The crop prospects in the Regina district could not be better. Reports from many towns adjacent to the city are also most encouraging. Plenty of moisture is in the ground, as this district has had plenty of rain, and the summer weather of the past few weeks has done much to inspire confidence in the crop outlook. The building activity in Regina is marked. Some trouble has been experienced by builders in regard to the labor problem, but this is now settled and contractors have more work on hand than they can possibly complete this year. A large amount of municipal work, such as sewer and waterworks construction, has also to be done in Regina this year.

"Good Roads" Campbell on the Importance of Drainage

"There are three principles to be observed in making good roads," said Deputy Minister Campbell to the Canadian Club at St. John, N.B. "The first is—drainage. The second is—drainage. The third is—drainage."

By this striking expression the man who is known as "Good Roads" Campbell sought to emphasize the importance of drainage in road construction. In the first place there should be ditches to drain the roadway. But these would be of no value unless they led somewhere and could empty themselves either naturally or by drains made through adjoining property for the purpose. A road is not drained where water lies in the ditches. Then it is necessary to have the road itself drained, so that water will not lie on the surface, and this is provided by a crown or rounding surface that sheds the rain into the ditches to be carried off by the drainage system. Mr. Campbell pointed out that it is a waste of labor to keep on year after year putting on broken stone or other material to fill up holes in a road that is not drained. In making a transverse section once in such a road he found five or six feet of such broken stone, that had been put on year after year only to sink out of sight and leave the road as bad as ever.

This is practical talk. It lies at the base of every system of good roads. It places the emphasis in the right place. It is the testimony, also, of the man who has constructed some of the finest roads in the Province of Ontario.

But Mr. Campbell has something to say that is worth saying in regard to the organization of road work. He once told the people of Ontario that if they would give him for fifteen years the annual expenditure of two million dollars on the rural roads of the province, he would, in that time, and for that amount, macadamise every mile of highway in Ontario. This seems an amazing statement, but upon examination it is found to be reasonable enough. The trouble in Ontario was that most of the expenditure was made year after year on work that was not permanent, that was not well done, and that had soon to be done all over again; whereas perfectly built macadamized roads can be kept up at a mere trifling expense from year to year for all time.

Mr. Campbell's advice is this: Let the statute labor be commuted at its cash value. Let all the road moneys of a district be put into one consolidated fund. Have a plan of the roads made, and then begin at one point as a centre, and make a certain amount of perfect road each year until the whole plan has been carried out for the whole district. This plan has produced wonderful results wherever adopted in Ontario. It is not less worthy of consideration in the Maritime Provinces, where there is great need of better roads.—Maritime Merchant.

The Royal Institute of British Architects were to have held a Town Planning Conference in London on May 28th last. On account of the death of His late Majesty, however, this event has been postponed until August 10-15 next. Full particulars may be obtained upon application to the Secretary-General, Town Planning Conference, 9 Conduit street, Regent street west, London, England.

The foreman of construction on the new provincial buildings at Edmonton, Alta., has been laid up with a broken leg for the last six months, during which time the Department of Public Works has paid his full salary of $150 a month and all expenses, making a total of nearly $2,000.

Good Progress being made on the Point du Bois Power Plant

One of the largest engineering undertakings of the Dominion was inspected recently when 75 of the leading business men of Winnipeg chartered a special train and ran out to Point du Bois to go over the civic power plant. This plant will eventually have a capacity of 100,000 horse power and will cost, when completed, over $4,000,000.

The excursion was under the management of the power committee of the city council. The visitors included all the executive and department officials of the city. Controller Cockburn, who is directly supervising the work, the contractor for the plant, John Gunn, and Resident Engineer Scott provided the explanations of the work for the party. A large portion of the day was spent in inspecting the immense work and general surprise was manifest at the progress. The machinery will be installed during October.

The object of the work to date, outside of the wheel-pit construction and work on the arrester and power house, has been to stem the tide of the mighty Winnipeg river and divert its course into a cement walled canal which conveys it through the wheel-pits and transformers, and back into the original channel, divested of nothing, but utilized to give the city light and power.

View of South Canal Wall and Power House construction taken upon a recent visit to the Point du Bois power plant, Winnipeg's greatest municipal undertaking

Already 34,000 cubic yards of cement have been laid. Another 16,000 yards will see the cement work completed. Sixteen thousand sacks of cement are being used every day, Sundays included. A force of 450 men, working in double shifts, is rushing the work ahead. Sixty thousand cubic feet of granite rock have been blasted out of the canal and removed, partly to the stone crusher, but mainly to the rock-fill dam, where the material is being used to continue the dam of the original course of the river above the plant. In the removal of this granite, more than $18,000 worth of dynamite has been used. Money is being blown up in this manner, even now, to the extent of $200 per day.

Work on the power house is continuing rapidly and in the course of the next month will be completed. The big work, so far, has been the excavating of rock and the placing of cement for dams and wheel pits into which the turbines will be placed

Much satisfaction was expressed over the progress and it is now assured that, barring accident, the city will be able to distribute its own power next year. The city is being asked, daily, to tender on light and power supply to several big manufacturing houses, and it is certain that civic power at rock-bottom rates will be a big stimulant to the manufacturing enterprises of Winnipeg and district.

A Moist Closet for Cement Tests

A moist closet designed expressly for maintaining a constant temperature and a constant degree of moisture for setting tests of cement has been in use by the Department of Railways and Canals, on the Lachine canal, where especial importance is attached to time of setting because the cement is used under water. With other types used the temperature and moisture are apt to be materially changed in opening the closet to make tests. The new closet, therefore, was provided with an arm-hole, through which the test is made, the door being used only for placing the pats. The cuff of the coat prevents any air entering, and on the arm being withdrawn the hole is quickly closed. The closet is 3 feet high, 3 feet wide and 18 inches deep, with walls of concrete 2 inches thick. The bottom of the closet acts as a tank to hold about 2 inches of water. The mix was rich and there is no leakage. The temperature inside the closet is usually 65 degrees in summer and winter, varying about 1 degree. Wet cement bags are placed on top during very hot weather, and repeated tests have indicated, it is stated, that the temperature can be evenly regulated. Water is seldom added to the pan forming the bottom of the closet, showing that litle or no evaporation takes placed inside the closet. The closet is carried on a base about 30 inches high and two open shelves are built below it.

One gallon of mixed paint will cover from 25 to 30 square yards of stone work; 50 to 70 square yards on wood work; 80 to 90 square yards on iron work; and 40 to 50 square yards on plaster. One pound of mixed paint will cover wood four yards for the first coat, six yards on the second coat, and seven yards on the third or fourth coat.

Problems of Modern Sewage Filtration

An Instance where Iron is Contributed by Manufacturing Plants—Effect Upon Sand Filters Excluding from Sewage and Removing from Beds

The means that are being adopted by the city of New Britain, Conn., to overcome trouble arising from the presence of iron in the sewage filters are set forth in the "Municipal Journal and Engineer," of New York, by F. H. Oldershaw, city engineer, who writes:

In 1900 the sewer system was reconstructed into a separate system of sewers, one sewer being for storm water with outlets to neighboring streams, the other sewer being for house sewage only. All new sewers constructed since have been built on this plan. The lateral and intercepting lines of the system for sewage only have an outlet through two large trunk lines to the filtration station. The east trunk line, so-called, carries the sewage of 65 per cent. of the city in general and 75 per cent. of the sewage and wastes from the large number of our hardware manufacturing concerns, the south trunk line, so-called, carrying the sewage from the balance of the city.

The system used for sewage filtration is the downward intermittent filtration. The beds are constructed of coarse gravel and the underdrains are from 5 to 6 feet below the surface of the beds. We have at present 33 beds, each one acre in area, and one bed five acres in area. Before the sewage is turned onto the beds it passes through settling tanks, of which we have two, they being used alternately for a period of one week each and then cleaned. These tanks remove by sedimentation about 50 per cent. of the sludge, or about 16 cubic yards daily, and have proved an important adjunct to the beds, as they relieve them to a great extent and, by confining a large part of the sludge to the tanks, obviate the raking of same continually from the beds, thus reducing the maintenance cost considerably.

The population at present is 46,000, and our daily sewage flow at the filtration plant is about 6,500,000 gallons, this being determined by weir readings.

Before these filter beds were built it was shown by experiments conducted with the soil that about 200,000 gallons of sewage could be filtered every 24 hours by beds one acre in extent. From 1902 to 1907 the beds came up to all expectations in their work. In 1908 it was noticed that the efficiency of the beds was greatly lessened and they were unable to handle as large an amount of sewage, and the beds were carefully watched to find out the cause.

In June, 1909, it became very apparent that there was considerable iron in our sewage, this being shown by a reddish brown deposit in the effluent ditches and at intervals by the imparting of a distinct color to the sewage. This presence of iron was shown conclusively a little later on by the formation of a crust on the surface of the beds, which proved very detrimental to the working of them. Geologists are well aware that the oxides of iron are the chief cementing material of certain sandstone. From investigation and analyses of this crust above mentioned, it was found that the beds were becoming coated with a ferruginous cement which formed the above crust, analyses of which showed about 75 per cent. of silica and 24 per cent. of iron and small quantities of magnesium, aluminum, tin, zinc and calcium.

Trouble from Factory Waste

It was immediately apparent that the trouble came from factory waste and it was traced for the most part to one of the manufactories and proved to be the waste from their wet sand rolling barrels. We immediately took up the matter with the officials of that concern, and they co-operated with us in overcoming the difficulty, by passing all their wastes through a system of settling basins at their plant before allowing them to enter our sewers. The result has been that no crust has been formed since.

This did not, however, bring back the beds to their full efficiency and in the fall of 1909 it was determined to build a small experiment station according to plans as designed by the city engineer; the station, consisting of a grit chamber, 2 feet x 2 feet x 2 feet deep; a septic tank, 10 feet x 12 feet x 5 feet 6 inches deep, and two beds, 22 feet x 20 feet, these beds being of the same construction as those in use. The station was built and put into operation in November, 1909.

Data along the following lines were obtained as soon as possible: First, data from all the manufacturing plants as to the average daily amount of water from iron work; second, as to the different acids used in the work and how much per day; third, as to whether the waste emptied from vats at intervals or flowed continually into the sewers. At the same time, analyses were made three times a week of the sewage and septic tank and filter effluents. These analyses included the determination for iron, as it was considered that this would prove the cause of trouble. After the experiment station had been run a short time, analyses which were made showed that the filter effluent was much better and the rate higher than for the regular filters, but also showed that there was a considerable deposition of iron in the filters. Results from the determination of iron made it apparent that about 40 per cent. of the iron in the sewage settled out in the septic tank, the remainder being practically all caught in the filters and clogging them up, which resulted in a lower rate of filtration. Analyses of the sewage of the trunk lines made at the same time showed an iron content of 1.6 parts per million in the south trunk line and 26.6 parts in the east trunk line, the latter being equivalent to 221 pounds per million gallons, a large portion of which remained in the filters.

We immediately turned our attention to the iron contents in the east trunk line and obtained numerous samples of sewage at points where the different manufactories individually emptied their wastes into the sewers. Analyses of these samples showed that four of the above were the chief offenders, the samples showing 124, 52, 70 and 105 parts per million, respectively. These analyses did not show the average amount of iron was discharged at certain times of the day. The chemist at one of the manufactories is now at work experimenting on the matter and is investigating methods for the removal of the iron by producing a by-product, and if this proves a success the other manufactories will use the same treatment.

After the iron is eliminated from the sewage, we will have to take up the matter of the iron already deposited in our filters. Analyses have been made for the determination of iron in the material of the different filters, the samples being taken at depths of every 6 inches. The results of these analyses so far show that 250 tons of iron have been deposited in the first foot of material of the 34 regular filters, the amount of iron decreasing until at a depth of 24 inches, the material seems free from the iron. Two means of removing this iron are now under consideration: First, by removing the top material of each bed as far as the iron has penetrated and replacing with new material; second, by passing some chemical through the beds and carrying off the iron in solution.

It can be readily seen that excessive amounts of iron are discharged into the sewers at intervals and, if it continues, the filters will in time be put out of commission. If methods are not devised for taking out the iron from the wastes before they are discharged into the sewers, arrangements can be made for these wastes to be held at the different manufactories until a certain time each day, when they can be discharged into the sewers at the same time and given special treatment at the filter beds on beds for that purpose only.

Experiments on the question are still under progress, but have not been carried far enough for definite conclusions, and at present it is impossible to state just what we will do to remedy the conditions.

A Novel Cement House

In Belfast, Me., there is a house, built by Frank Hoag, believed by the builder and citizens of that place to be the only one of the kind on earth. Aside from the blasting and digging for the cellar, the house was built by Mr. Hoag himself. The entire outside is of cement, the mixing of the component parts being undertaken after a long study of the subject. Mr. Hoàg finished the inside of the house first. This being done, he lathed the whole outside with wire screen stuff, such as is used for fencing chicken pens. This was firmly fastened. The studding was close, and when the wire was on it gave a rigid surface on sides, ends and the slopes of the roof. Over this layer of wire he spread a first coat of cement. It was well pressed on, so that it oozed through the meshes of the wire for clinching hold. When this first coating was thoroughly set another and a heavier one was spread over the surface. Shingle effects were fashioned on the gables and on the roof the cement was shaped and lined, to give an appearance of slating. Then over the whole outside was laid a finishing veneer of cement paint. The house is as tight as a bottle. It is impervious to heat or cold, or leak of rain; and, as its foundation is a solid ledge, it can defy the frost to wrestle with it. Mr. Hoag says the cost of building was about the same as wooden construction would have been but with cost of maintenance and repairs eliminated.

Repairing Asphalt with Brick

Asphalt pavement repairs in the city of Binghampton, N.Y., this year will cost less than $500, although in years past, when asphalt was used as the pavement repair material, the cost ran up to $14,000. For the past month a force of men has been engaged in repairing the holes in the asphalt pavements with brick. It was first planned to use an asphalt mixture, but it was found that the material could not be utilized unless the city purchased a heater, which was inadvisable, and brick was again selected to fill the holes. All the asphalt pavements have been patched and are in condition to last another year.

Mr. Hilder Daw, C.E., Montreal, has been appointed one of three members of a special committee to bring in a report to the American Society of Contracting Engineers covering the question of a uniform system of contractors' specifications. This is to be reported in January, 1911. Mr. Daw expects to incorporate the views of the various Canadian societies interested in this report.

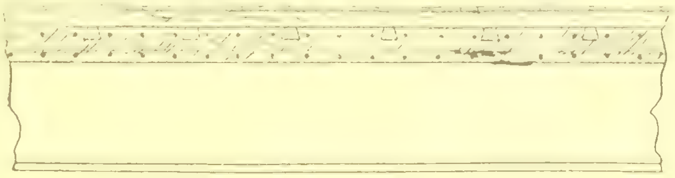
Mr. John M. Collins, of the Standard Sanitary Manufacturing Company, accompanied by the Hon. Charles J. Doherty, K.C., M.P., and Mr. Henry J. Tribey, K.C., counsel for the Standard Sanitary Manufacturing Company, sailed for England on the 24th ult., on the S.S. Victorian. Mr. Collin's business in England is the appeal of the Standard Ideal Company to the Privy Council, which comes up for hearing this month.

Oiling New York Park Roads

Experiments with the use of oil on roads are being conducted by the Park Department of New York City in the Bronx under Chief Engineer Schenck, but the work has not reached a stage where it is possible to give definite results. The experiments were begun about two years ago, but owing to the opposition of citizens they were dropped, only to be renewed again. Two grades of asphaltic oil have been tried, also crude petroleum, and an oil emulsified with 80 per cent of water. The use of 60 per cent. of oil in the emulsion has given the best results so far as wearing qualities are concerned, but it is objected to by citizens, while that which contains 20 per cent. oil maintains the roads dustless, but does not prevent them from travelling. Crude petroleum is secured at three cents per gallon in tank.

Laying Boards on a Concrete Floor

A new yarn mill, designed by F. W. Dean, mill engineer and architect, of Boston, presents an interesting type of machine-carrying floor of concrete with wood top. The necessity of providing a wood top of such sort that it would afford a secure attachment for machinery, dictated the special scheme shown in the annexed figure. Planed, dovetailed, nailing pieces or sleepers, 2-inch by 3-inch were accurately placed with centres 18 inches apart, and when the concrete was poured about them they were securely locked into the mass of the floor slab. It will be seen, by reference to the figure, that the sleepers were laid parallel to the support course of reinforcing bars in the concrete, and that there were three bars to each space between sleepers. The bases of the latter were a little below the level of the upper course of bars. Machines can be easily and securely attached to this floor by means of lag screws.


Wood Top Reinforced Concrete Floor.

Construction work on the National Transcontinental Railway has made good progress in the past year, according to the figures of the annual report for the fiscal year ending March 31. To the end of December, 312 miles of track were laid and in the intervening period 199 miles. Sixty-three per cent. of the railway work is now finished and 45 per cent. of the bridging. The mileage of track totals 760 and of sidings 165 miles. A total of 365 miles is graded. The expenditure is $71,137,993, of which $53,850,000 was spent in grading, $7,201,000 in rails, $8,237,038 in engineering and expenses. On the Winnipeg workshops the outlay has been $335,000. The big contracts for machinery and equipment are about to be awarded, the tenders having been submitted.

The question of what kind of a finish to give a concrete wall is a matter of personal opinion, which is ever changing. The rough casting, or plastering of a wall, which has been the most common, is fast giving away to a more artistic treatment. A wire-brush finish brings the coarser aggregates to the surface and gives a pleasing effect. A scrubbing brush, applied while the concrete is green, will erase the board marks and rounds up the wall to a sandlike finish. A carborundum stone is used for rubbing down a wall, and with it you can get almost any texture. The finish that is pleasing to a large number of people, which is really no treatment at all, is to leave the wall just as it comes from the forms, with all the board marks showing.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the judgments of recent cases in which you were interested giving the main facts tersely.

Contract Between Municipal Corporations—Township of Gwillimbury v. Township of King. An appeal by plaintiffs from the judgment of Hon. Justice McMahon, who dismissed the action. Plaintiff township claimed that defendant township entered into an agreement with plaintiffs to build and maintain a public road in continuation of a road to be built by plaintiffs, and plaintiffs relying on said agreement, built their portion of said road, but defendants refused to build their portion, and plaintiffs claimed a mandatory order to compel defendants to build their portion, and damages for breach of said agreement. Defendants pleaded that such agreement was not under their corporate seal, and therefore not binding on them. At the first trial the action was dismissed on above ground. Court of Appeal dismissed plaintiffs' appeal therefrom with costs, but defendants to repay plaintiffs $100 received from them.

Forfeiture of Contract—Buchanan v. City of Winnipeg; Stewart v. City of Winnipeg; Trial Court of Manitoba. These actions were brought to recover sums alleged to be due the plaintiffs in respect of a contract with the defendants. In October, 1907, the city of Winnipeg entered into a contract with Buchanan for the construction of a bridge across the Winnipeg river at Lac du Bonnet. Shortly afterwards he went into partnership with Stewart and they proceeded with the contract. The city had under construction at the time a tug and scow for use in building the bridge. It was one of the conditions that the contractor should take over the tug and scow at actual cost. One of the conditions of the main contract was the following: "If the works, or any part of them, be not completed at the expiry of the respective periods specified and guaranteed in the contract for completion, or if the contractor assign or sublet his contract without the consent had of the engineer, or if he commit any act of insolvency whatever, or if he permit any execution to be levied on his property, then the engineer may forthwith declare the contract forfeit, and in that case the corporation shall enter into possession of all the works, plant, and materials pertaining to the contract; and the contractor shall be liable for all losses and damage which the corporation may suffer on account of the non-completion of the work by the contractor, and he shall have no claim for payment in respect of the work thereafter performed. In default of other satisfaction for such loss or damage, the plant and materials remaining may be sold (at public auction) for the purpose of reimbursing the corporation. Provided, however, that, should the damage to the corporation resulting from the said default amount to a sum less than that due to the contractor under the contract, or obtained through sale of the contractor's plant as above, then shall the difference become due and payable to the contractor." Trouble arose between the partners and in January, 1908, the plaintiff, Stewart, notified the city authorities that it was impossible to go on.

The chief engineer, acting under a certain clause of the general conditions, then declared the contract forfeit. The plaintiff Stewart was placed in charge as foreman for the city, which adopted sub-contracts for the supply of material made by the contractors and used their plant and material. Since then they have taken over and used the bridge. An attempt was made to show that the engineer had made a special bargain with the contractors at the time the city assumed control of the work that if the cost proved less than the contract price the difference would be paid to the contractors. It was shown, however, that all he did was to tell the contractors that he would make a recommendation of this nature to the Council. The actual arrangement would have been beyond his authority. The Court considered the preliminary expense which had to be incurred by the contractors before they could do any work, for which they would have a claim against the city. The purchase of a tug and scow, the moving of their plant, the making of sub-contracts, the erection of a heating plant for heating the cement and of living camps for their employees and teams, was all work that had to be performed, and the contractors, no doubt, in figuring on the contract, made allowance to cover this preliminary expenditure. When the defendants took possession of the work, they had the advantage of this preliminary outlay, and were thus able to complete the work at an amount less than the face of the contract. They now claimed the right to retain for their own benefit this sum, amounting to about $4,000.

Decision was based in the main upon the argument framed by the House of Lords in the case of Ranger v. Great Western R.W. Company. It was held that the provision relating to forfeiture, etc., was to be regarded only as a means for enabling the employer to complete the work at the risk and cost of the contractor. In settling accounts with the contractors, the employer was bound to account for the value of the contractors' tools and materials. By taking advantage of the contractors' preliminary expenditure, including a large sum paid for a tug and scow and for a cement heating plant, the defendants were able to complete the work for less than the contract price. If it had cost the defendants more, they would have the right to sell the contractors' entire plant, and, if there still remained a deficit, to sue the contractors therefor. It could not be implied that the parties intended that the defendans were to take any profit out of the forfeiture of the contract in this way, although in the event of a loss the contractors would be liable for it. Judgment was referred to the Master for an account of the costs and expenses incurred by the defendants in completing the work, directing that the balance be paid into court to be apportioned among the proper parties. Plaintiffs were awarded costs of the action.

Recovery Under Lien—Sherritt v. McCallum; County Court of Victoria—This was an action to enforce a mechanics' lien for the sum of $160. One, John Young, had contracted to build the defendant a house at Foul Bay according to plans and specifications. Under the portion relating to plastering it was provided that the plasterer should cut out and make good all defects arising from whatever cause and make good after other tradesmen had finished work. Plaintiff, Sherritt, was a sub-contractor to Young for the plastering work. Plaintiff completed the main part of his plastering before July 14th. On applying to Young for payment the latter told him that he had thrown up the job. Afterwards plaintiff sent him an account showing a balance due of $160. It appears that Young got into financial difficulty and failed to go on with the building of the house. Defendant was forced to complete by day labor. No formal agreement was made cancelling the contract. On the 20th July the plaintiff gave the defendant notice that he intended to claim a lien, but no proceedings were taken. Under the Act the lien-affidavit must be filed in 31 days after the completion of the work, or else the lien expires; so about the 20th August the plaintiff was in a serious plight, as neither Young nor McCallum would pay him, and the 31 days had expired, and he had filed no affidavit. He then hit on the ingenious expedient of going to the unfinished house and touching up blemishes, etc., made in the plaster by the workmen who followed him. But in the meantime the defendant, who had been having a lively time with the claimants, had instructed his foreman on the job to allow no one but his own workmen on the premises. A couple of days before the 25th August the plaintiff sent his son to do the plastering, but he was refused permission to enter the premises by the defendant's workmen; but on the 25th August the plaintiff himself went, and, notwithstanding that the defendant's foreman, who was there, told him that the defendant had told him (the foreman) not to allow any of the contractors into the building to finish their work, he went in and did four or five hours' work, putting on some dentals that had been knocked off, and fixing up some blowholes and cracks. He then filed his affidavit and brought his action, and contends that this last work relates back and he is entitled to a lien for the full amount unpaid. Under the Mechanics' Lien Act a lien is given only in respect of work done at owner's request. The Court held that the circumstances showed that the plaintiff was not making a bona fide attempt to complete his contract but instead to manufacture a lien. The action was dismissed with costs.

Damages for Defective Highway Construction—McMulkin v. Oxford; Divisional Court of Ontario. This was an appeal by the defendants from the judgment of Hon. Justice Teetzel. Plaintiffs brought action claiming that defendants had while engaged in repairing a highway wrongfully constructed certain grades and ditches along certain culverts through the highway so as to divert water from the highway and from an adjoining highway over which they had not assumed control, and from other lands into and upon plaintiff's farm, for which he claimed damages and an injunction. At the trial it was held that the evidence as to damages was conflicting, but there was no doubt that the excess of water discharged on plaintiff's land caused him loss and inconvenience, and would have a depreciating effect upon the value of his farm. In lieu of an injunction judgment was given plaintiff for $450, for damages past and future, with costs. The Divisional Court dismissed the appeal with costs.

Acceptance of Private Lane by City—Rushton v. Galley; Divisional Court of Ontario. Defendant was the owner of certain property. About 40 years ago he laid it out in building lots, reserving a lane leading from public highway. This lane has been open ever since. The city laid gas and water thereon many years ago and never assessed it to anyone. Since then defendant built a sidewalk thereon and plaintiff was injured by the same being out of repair. He brought action claiming damages for injuries sustained. At the trial the action was dismissed on the ground that the lane had been dedicated to and accepted by the city. The Divisional Court affirmed this decision and dismissed plaintiff's appeal with costs.

Negligence of Waterworks Official—Shaw v. City of Winnipeg. The city of Winnipeg appealed against a decision in which damages and costs were awarded for alleged negligence on the part of an official from the waterworks department. The official in question called at plaintiff's house to examine the water meter. For this purpose he opened the trap door in the floor of the kitchen. After performing his work he left the house without closing the trap door, as a result of which plaintiff's wife met with an accident. The court found that it was the duty of the official and of the city to perform the inspection without doing injury or committing nuisance and to leave the premises in the same condition as they found them. The appeal was dismissed with costs.

Mechanic's Lien—Rathburne v. Michael, Court of Appeal. This was an action for the enforcement of a mechanic's lien tried before an official referee who gave judgment for the plaintiff. The action was on a claim for a mechanic's lien on defendants' property for $1,125.98, tried before an official referee, who gave judgment for plaintiff, holding him entitled to a lien for $1,075.17. Defendants appealed to a Divisional Court on ground that action had not been commenced within 30 days from delivery of materials therein mentioned to amount of $1,700, and Divisional Court allowed the appeal, but afterwards on application therefor reopened the judgment, received further evidence, reversed their former judgment and dismissed defendants' appeal. The Court of Appeal affirmed the later decision of the Divisional Court and dismissed the appeal with costs.

Lining an Irrigation Canal with Cement Plaster

Community Ditch, an irrigation canal of 650 sec. feet capacity at Eldorado Springs, north of Denver, Col., has recently been the subject of considerable discussion owing to the nature of the repair work carried on by J. G. Wood, assistant engineer in charge, and W. D. Rohan, superintendent of construction. Two thousand, six hundred and forty feet of masonry lining in the canal completed in March, 1909, was so carelessly built as to be useless in September of the same year. Of four possible methods of repair the engineers chose that of plastering the masonry with cement plaster, a decision that precipitated a lively controversy as to the comparative merits of lime and cement for such work. The engineers, however, were not dismayed by this. Cement costing $1.36 per barrel was delivered by rail within 500 yards of the ditch. Good, sharp clean sand was found across the creek and brought to the ditch in one-half cubic yard cars at a cost of 25 cents per cubic yard. The mortar was mixed in a one-fourth cubic yard Ransom mixer with gasoline power, costing 40 cents per day.

The joints were first picked out and the wall thoroughly washed with a hose, when the joints were re-jointed with 1 to 3 mortar. The first coat of three-fourths inch mortar was put on with plasterers' and masons' trowels after the wall was well wetted, and then floated with wooden floats. After setting four to six hours the second coat was applied and floated in the same way. The plaster was kept wet for two or three days after.

An inspection in May, 1910, showed the ditch in splendid condition after five months' hard wear. No signs of pulling away were found in the plaster, but five contraction cracks appeared at points of tangent, and these have silted up. The conclusions drawn by a writer in "Engineering-Contracting" were:

1. The addition of lime—hydraulic, hydrated or otherwise—to cement plaster or concrete is neither economical nor beneficial.

2. Cement plaster is the cheapest and most satisfactory method of lining and waterproofing earthwork or masonry ditches.

3. Cement plaster can be made permanent on masonry or concrete, no matter how old, by (1) thoroughly washing the surface to remove all dust and dirt; (2) having surface well soaked; (3) thoroughly floating to get plaster as dense as possible and ensure good contact by expelling all air.

4. With skilled superintendence common labor gives good results.

5. No need for acid washes to ensure a good bond.

6. A thick coat of grout wash is sufficient protection for concrete and plaster against a fairly heavy frost.

The city of New Westminster at the present time possesses 69 industries, and 39 fish canneries are located in the immediate vicinity. New industries are being added at the rate of six or eight a month, while the rapid purchase of industrial sites bespeaks a bright future.

Railway Work in the Province of Alberta

Resume of Construction in hand and Projects Contemplated — Companies' Plans Somewhat Abridged Owing to the Scarcity of Labor

A reader of the "Contract Record" interested in the western contracting field addressed us recently asking for information in connection with railway developments in Alberta. The following information, furnished us by Mr. F. F. Fisher, secretary of the Edmonton Board of Trade, will doubtless be of interest:

Owing to the scarcity of labor it will be impossible for the companies to carry out nearly all the work that they had laid out for this season, and at the present time it is impossible to say with certainty how much work will be done, or which lines will be built and which carried over for future operations.

"To start with, the Grand Trunk Pacific is now running trains about 120 miles west of Edmonton, and about a similar distance from that point to the Yellow Head Pass is now being put under construction. There is but little doubt that the rail will be laid to the Pass this fall.

"The Canadian Northern has its survey closely paralleling the G.T.P., about 50 miles of which to the west of Edmonton is partly built. On half of this distance trains have been running for a year or two. Until a few weeks ago it was expected that this line would be continued as their main line. They have recently, however, made a sudden change and have now started work on a new survey which branches off their road running northerly from Edmonton at a point about ten miles out, then turning westerly and keeping to the north of the Grand Trunk Pacific. It is understood that every effort is being made to rush construction on this line. I also have information to the effect that a spur line will be built southerly from the main line of the C.N.R. to reach some very valuable coal fields controlled by Mackenzie & Mann, some 130 miles west of Edmonton and about 30 miles south of their main line. It is understood that this spur will be built just as soon as their main line reaches a point far enough west, as they are exceedingly anxious to get access to this coal for the use of their road.

"At the last session of the Alberta Legislature bonds to the extent of $13,000 per mile were guaranteed for a road to be built northwesterly by the C.N.R. to a point on the Athabasca river, in the neighborhood of old Fort Assiniboine, this, of course, being the first instalment of a road to the Peace river. The understanding is that a guarantee will be given for the balance of the road when the first section is built. Assurances were given that this first section would be built this season, but it is now doubtful whether the company will be able to make good on that.

"The C.N.R. line from Edmonton to Athabasca Landing was also supposed to have been completed this season, but this work also will likely have to be left over. About 20 miles of this line, as far as Morinville, is now in operation, and grading is done about 20 miles further. A guarantee of bonds was also provided for 25 miles of a road to go easterly from a point north of Morinville on this branch.

"A guarantee of bonds was also provided for a line of about 50 miles southeasterly to connect Camrose, on the Wetaskiwin branch of the C.P.R., and the Vegreville-Calgary branch of the C.N.R. with Edmonton. It was partly arranged that this road should be placed under operation this coming summer and it was understood that this would be carried out if men could possibly be obtained to do the work.

"Bonds were also guaranteed at the last session for a C.N.R. line southwesterly from Edmonton, passing through the Pigeon lake country and the valley of the Blindman river. This would render accessible some magnificent agricultural country which has hitherto had no means of transportation but which is fairly well settled. There does not now appear to be any prospect that construction of this line will be undertaken this year.

The Alberta & Great Waterways Railway is to be built from Edmonton to Fort McMurray following a general course slightly east and north. These people were all ready to start active construction and had contracts let and large quantities of all supplies on the ground with a view to completing about 150 miles this summer. Owing to the political difficulties which have suddenly developed, however, this work has all been held up and there is practically nothing being done in the meantime.

"In addition to these roads radiating from Edmonton, G.T.P. branches are being built southward from Tofield and Wainwright on the G.T.P. The C.N.R. branch from Vegreville to Camrose is being put into working shape and extended southward towards Camrose.

"Final arrangements have been completed by the C.P.R., the cities of Strathcona and Edmonton, and the Dominion and Provincial Governments, for the construction by the C.P.R. of a high level bridge between Strathcona and Edmonton to cost approximately one and one-half million dollars. Preliminary work is now being done and it is understood that this work will be rushed ahead and that the structure will carry trains before the close of 1911. It is generally understood that the expenditure of this large amount of money on this bridge means that the C.P.R. intend to extend their present line across the Saskatchewan and proceed northwesterly in the direction of the Peace river. They already have the necessary charters and have completed their final surveys, made with that end in view.

"At the session of the Dominion Parliament just closed, a subsidy of $6,400 per mile was voted to the Pacific & Omenica Railway for 110 miles northwesterly from Edmonton. It is understood that the G.T.P. control this charter and that this is a G.T.P. enterprise. This line is for the purpose of enabling the G.T.P. to reach the rich Peace river country.

"In addition to the roads I have mentioned there are a number of charters in existence for roads northerly and northwesterly from Edmonton, but so far as I am aware these are in the hands of promoters rather than of railway builders, and at the present time can hardly be considered as practical railway propositions."

Mr. Charles Silson, of Oshawa, Ont., has resigned his position as assistant engineer of that town to become road superintendent for the county of Prince Edward.

The concrete linings of the aqueduct bridges on the Illinois and Mississippi Canal have been in service through two seasons and, according to the engineer, have given satisfaction. The concrete was a 1 : 4 mixture, using well-graded gravel, or 2 : 3 : 5 when fine crushed stone was used for the coarser aggregate. The bottom is 6 inches and sides 9 inches thick. The depth of water is 7 feet. The linings are practically water tight, the exterior at nearly all points being dry under a full head of water. The only place where seepage shows to any noticeable extent is on some of the sides, at the joint between two days' work. No seepage shows where the sides were carried up continuously.

Trade News from Montreal

Any amount of work, and supplies plentiful in this locality—Contractors making the most of a good season

Montreal Office of the "Contract Record."
July 2nd, 1910.

Under most favorable weather conditions building operations in the Montreal district are proceeding at a rapid pace. The large bulk of the work on hand at present consists of excavations, and until a later stage is reached there will be a comparative lull in the business of local builders' supplies. For a short time trouble, in the form of a strike by stonemason contractors, threatened to tie up advanced construction work, but this danger seems to have been averted. The mason workers asked for an increase over the standard agreement of forty cents per hour. Contractors are always willing to pay according to the ability of their laborers.

The scarcity of teams during the progress of the extensive excavation work under way continues to be a feature of local conditions.

Supplies are plentiful, and, generally speaking, the market is quiet. Cement, however, continues to move freely.

Common brick are selling well and are being used in construction of the cheaper class of houses in the north and eastern parts of the city.

Pressed brick are not so plentiful as in the earlier part of the season.

The P.Q.A.A.

At a special general meeting of the Province of Quebec Association of Architects in the Association rooms, 5 Beaver Hall Square, the following resolution, re Federation of Provincial Architectural bodies with the Royal Architectural Institute of Canada was passed:

10. That a Dominion Institute of Architects must consist of properly organized Provincial Associations. Architects in Provinces where there are no Provincial Associations, are advised to form one, or to join an existing Provincial Association.

20. That all Provincial Associations must first be organized on a basis equal to the charters granted to the Ontario Association of Architects, the Alberta Association of Architects, or the Province of Quebec Association of Architects.

That examinations shall be controlled by the respective Provincial Associations.

40. That in order to establish a uniformity of standard, the curriculum and examination papers from each Provincial Association be submitted to an advisory board appointed by the Dominion Institute and consisting of representatives from each Association, whose duty shall be to give such advice to Provincial Associations as will tend to raise and unify the standard.

Such advisory board to be appointed for two years by way of trial.

50. That membership in such Provincial Associations shall "ipso facto" constitute membership in the Dominion Institute, but that, on the other hand, membership in the Dominion Institute shall not constitute membership in any, or all of the Provincial Associations.

60. The Council of the Institute to be composed of delegates appointed by the respective Provincial Association.

80. Each Provincial Association to pay to the Dominion Council a per capita fee, or a fixed sum per Association.

70. All officers of the Institute to be elected by the Council

90 That the present charter of the Royal Architectural Institute of Canada be amended accordingly.

Kensington School

The Kensington school, which will be erected in Notre Dame de Grace during the present season, is to be a two-storey building containing ten class rooms. The exterior finish will be in brick with Roman stone trimmings. The structure was designed by Messrs. Peden & McLaren, architects, Montreal, and is being erected by Robertson Bros., general contractors. T. A. Morrison & Company are supplying the Roman stone requirements.

Inspection of Grand Stands Ordered

Two important motions were adopted at a recent meeting of the City Council, which call for the inspection of all grand stands in the city limits, as well as for the inspection of grand stands for the aviation meet, and other stands outside the city confines, where Montrealers are accustomed to gather for sporting events.

The first motion read as follows:

"Whereas, the public of Montreal assists at different places of attraction, such as race courses, aviation meets, athletic meets, and others, outside of the limits of the city of Montreal, and as it is necessary that the stands erected within those places of amusement should provide for the public of Montreal a perfect security, it is moved that a request be sent the Provincial Government to the effect of having all stands above mentioned inspected as to their safety."

The second motion reads:

"That the inspectors already charged for the inspection of the sprinkling tanks, be charged also to inspect all stands erected in all the athletic parks situated within the city limits, as to the solidity and security of said stands.

New Lachine Bridge

The Foundation Company, Limited, is shortly to commence construction work on the Lachine bridge contract. This includes the extension of the present piers on the downstream end, in order to provide accommodation for double tracking. Several new piers will also be built in between the existing ones, to carry additional structural work.

In carrying out this work pneumatic methods will be largely employed. It is estimated that 18 months will be consumed in completing this contract. The Dominion Bridge Company will fabricate and erect the extra structural steel.

New Quarry Company Organized

The St. Lawrence Quarries, Limited, have been incorporated with a capital of $100,000 to carry on the business of quarries and pavers. Messrs. Blair & Laverty are solicitors for the incorporators, about whose plans no definite announcement has yet been made.

Earl Grey School Building

The construction of the Earl Grey School Building on Christopher Columbus street for the Protestant School Commissioners is progressing at a steady pace. All the masonry work on the two fireproof wings has been completed and these have been roofed in. At present the contractor, Mr. Cape, is proceeding with the interior work and it is fully expected that the structure will be ready for occupation with the opening of the fall school session. This building was designed by Mr. A. F. Dunlop, whose plans were accepted in competition with a number of other architects. It is a skeleton steel type structure, two storeys in height, with basement, and fireproofed throughout. The exterior is finished with La Prairie pressed brick trimmed with Roman stone. The Phoenix Bridge & Iron Works, Limited, erected the steel and Messrs. T. A. Morrison & Company supplied the Roman stone. Mr. E. G. M Cape is the general contractor.

Notes

Many new homes are being erected on the upper level, Westmount, and new streets are being opened as rapidly as possible. It is estimated that there will be more than a hundred houses on the market this autumn.

The erection of the new reinforced concrete factory building for the Dougal Varnish Company, on Manufacturer street, Point St. Charles, has been placed well under way. Mr. A. F. Dunlop is the architect and Mr. E. G. M. Cape general contractor.

The stock and business effects of Mr. Thos. Wand, general contractor, insolvent, were disposed of recently by auction sale. Local contractors comprised the chief purchasers of the building materials and machinery.

A new steel dredge for the Montreal Harbor Commissioners has just been launched at the Toronto yards of the Polson Iron Works and is now on its way to Montreal. The

Dredge No. 5, and is of much larger proportions than any new dredge will be known as the Harbor Commissioners' of the dredges at present in use in the harbor or Lake Ontario. In length it is 104 feet, beam, 36 feet; breadth at bow, 10 feet 9 inches; breadth at stern, 10 feet 8 inches.

Mr. R. S. Lea, consulting hydraulic engineer, is at present on an extended trip through the Canadian West. Mr. Lea will go right through to the coast and will retuın towards the latter part of July.

Mr. J. F. Jago is in Toronto, where the firm of Jago & Harris, of which he is a member, have just secured an important contract for the construction of the new Norway school in the eastern part of that city.

The engineer in charge of the St. Lawrence Ship Channel station has notified the Marine Department at Ottawa that the work of widening the channel through Lake St. Peter has been completed, with the exception of a short section at Nicolet traverse. At this point, however, the channel is at the present time 250 feet wide.

Mr. E. G. M. Cape, general contractor for the erection of the additional fireproof wing to the McGill University Medical Building has the excavation work well under way. The necessary rock has been removed and they are now busy on the rubble excavation work. Messrs. Brown & Vallance are the architects for this building.

The general contractors for the erection of the A. E. Rea & Company's buildings, Messrs. Byers & Anglin, are making rapid headway with the excavation work. The orange peel excavators supplied by the J. W. Harris Company are materially assisting in this work.

Winnipeg to Spend Millions

Will Probably Submit By-Law to Raise Six Millions Towards New Waterworks for Population of 500,000

Office of the "Contract Record."
Winnipeg, Man., July 2nd, 1910.

A project which will include some large works for contractors is being formulated in Winnipeg now, in connection with the proposed establishment of a municipal water works on the Winnipeg river west of the Point du Bois power plant.

Members of the city council are at present satisfied that Winnipeg's artesian system of water supply is being outgrown and with a view to providing for the immediate and distant future a by-law will be submitted to the public at the next municipal elections for the establishment of a water system on the Winnipeg river. The initial expense, if the by-law carries, will be in the neighborhood of $6,000,000, and this cost will ultimately be increased to $17,000,000. At this latter figure water supply for a city of 500,000 people will be provided.

The city's water supply is now stated to be in a dangerous condition, as the chief source of supply is one well. If anything should happen to this well, the city would be face to face with a water famine. The board of control of the city has already discussed the subject and last week a diminution test of the wells was ordered. In view of the approaching World's Fair to be held there in 1914 it is admitted that the water problem is a very serious one, and the temporary extension of the present system at a large outlay of money is considered inadvisable. It is now stated on good authority that one member of the present city council will go before the public as a mayoralty candidate on the platform of a new system of supply.

Three years ago a board of consulting engineers, consisting of James H. Fuertes, R. S. Lea, J. E. Schwitzer and George C. Whipple, carried out at a cost of more than $15,000 an investigation of the water supply question and sent in a report in favor of the seven portages on the Winnipeg river, as the most favorable available sources of supply. With the civic power plant on the same river nearing completion, city power could be used in the pumping of water to and from the city and it is thought that the citizens, who are now feeling the scarcity of water, will favor the adoption and execution of the report of the commission. The C.P.R. has offered $200,000 toward the cost of the work.

Two of the largest apartment blocks to have been constructed in Winnipeg this summer are now in the passive stage owing to the failure of loan companies to make the required advances on the properties. These are the Rostrevor and Regent apartments, whose joint costs were to have been in the neighborhood of $750,000. In the case of the Rostrevor, which is being erected on Bannatyne avenue in the rear of the Carnegie Library, the basement was fully completed before it was found impossible to continue the work. Some arrangement may yet be arrived at whereby it can be constructed, but just now there is some discussion about the city leasing the basement for a public swimming bath. The Regent did not go as far in construction as the Rostrevor although the building permit was taken out. These are not the only two buildings tied up by reason of loan companies refusing to advance money. There are in the neighborhood of a dozen smaller works in the same state of financial coma.

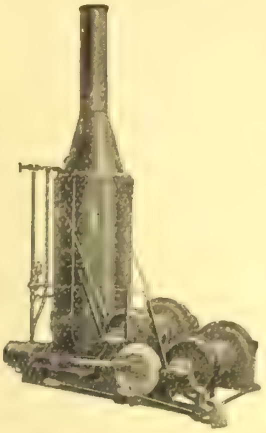
Knighthood for Civic Improvement Workers

Sir Henry Newell Bate, K.B., chairman of the Ottawa Improvement Commission, who was one of the Canadians honored with knighthood recently, was born in Truro, Eng., in 1828 and came to Canada as a young man, taking up residence at St. Catharines. He has resided in Ottawa since 1854 and has done much for the development of the city. As chairman of the Ottawa Improvement Commission, he was one of the first to conceive the idea of the Rideau canal driveway and purchase of the parks, which have greatly enhanced the beauty of the Dominion's capital city. He has presided at the meetings of the commission since it was first formed in 1889. It is for his work in connection with the Commission that Sir Henry's name was included in the list of birthday honors.

Somewhat curiously another Canadian who received the same honor, Sir Edmund Walker of Toronto, is closely identified with civic improvement work in the Queen City.

More About the Lindsay Report

Commenting upon the Lindsay ozone report, the "Municipal Journal and Engineer" says: "It will be seen that the report of Dr. Archibald is based upon tests of only eleven bacteriological samples, some of which were taken when unusual conditions existed. It is unfortunate that another and more extended series was not taken when all conditions could be maintained normal. As it is, his figures (omitting one abnormal set) show that the filters removed on the average about 72 per cent. of the bacteria., the ozone about 83 per cent. of the remainder, or the two together about 95 per cent. Nothing is said of the effect on color or organic matter. The test of the representatives of the Provincial Board of Health extended over three months and was chemical as well as bacteriological. Their report expresses belief in the effectiveness of ozone, but appears to show this plant to be inefficient because of faulty aspirators. There appears in the report some confirmation of the prejudice against the plant said to be entertained by certain officials of the board; but, allowing for this, unless it can be shown that the tests themselves were incorrectly made or reported, it seems to be demonstrated that the plant cannot be considered a success although it may be possible to render it so by increasing the efficiency of the aspirators."



The Best HOIST in Canada

Note Well the Exclusive Features

The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

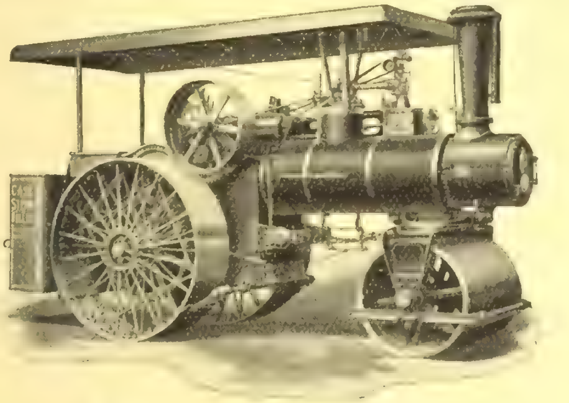
The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard, so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal

The Only Spring-Mounted Road Roller Built



Case 36 Horse Power, 10-ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Guaranteed to do all or Anything that can be done by Any Other Make or Design of Road Roller.

We sell the well known line of Troy Dump Wagons and Dump Boxes

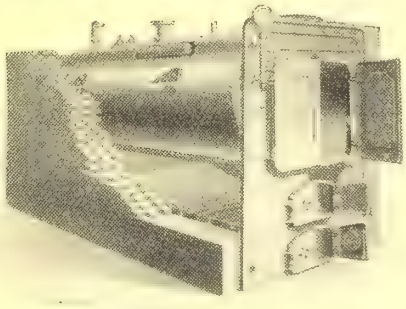
Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina Saskatchewan; Toronto Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

STEAM HEATING BOILERS



OF ALL SIZES
FOR
Public Buildings
Manufactured as a Specialty

Quotations and Information given by

E. LEONARD & SONS, Engine and Boiler Manufacturers, **LONDON, ONT.**

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime.
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Phone Main 6805–6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheets
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slaters' Tools, Etc.

JAMES BRODIE & CO.

Quarriers and Manufacturers of

Canadian Quinsy, Ebony and Stanstead Granite

Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty

IBERVILLE, QUE.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts. TORONTO

Office Phone P. 64 Residence P. [illegible]

Canadian City Engineers

J. W. B. Blackman, New Westminster, B. C.

No city in Canada to-day is more alive to the necessity for skilled engineering work than the ancient city of New Westminster on the Pacific coast. For some time the flow of settlement and industries in that direction has been steadily increasing so that where a year since one man was employed there are now five under the superintendence of the city engineer, Mr. J. W. Burnard Blackman.

City Engineer Blackman was born in Kent, England, in 1878, and educated at Highbury House College, St. Leonards-on-Sea. His early professional training was received at the hands of Mr. G. F. Miller, M.I.M.E. Later, he took a course at the Brighton College of Engineering and Science, where subsequently he held a mastership. For six years he practised his profession in the city of Brighton, Sussex. During this period he was a frequent contributor to leading technical publications. The "Builders' Journal," one of the best known periodicals of the kind in London, commented very favorably upon several of his plans, and "Modern Buildings," amongst other standard books, gave specimens of his handiwork. After the early stages, however, Mr. Blackman devoted the greater part of his attention to the various phases of municipal engineering, having discovered that in this direction lay his forte. Mr. Blackman has had valuable experience in the construction of sewage disposal works, modernized systems of drain sewers and special adaptations of mechanical and scientific sanitation. He is an associate member of the Canadian Society of Civil Engineers, a professionsal associate of the Surveyors' Institute (Eng.), and a member of the Society of Architects of England. In 1907 he accepted an appointment as manager for Mr. J. H. Brownlee, C.E., of Vancouver, with whom he remained until March, 1909, when he went to New Westminster as city engineer.

City Engineer Blackman, of New Westminster, B. C.

New Westminster is a thriving city of some 15,000 people. It is situated about 14 miles from the Pacific Ocean on the north bank of the Fraser river, and is the great fresh water port of western Canada. Added importance is derived from the fact that it is the centre of a vast agricultural, mining and dairying district of nearly 5,000,000 acres. It is sometimes called the "Pacific Liverpool," by reason of the similarity of its location and that of old Liverpool, which it has every prospect of emulating in rapidity of growth and population. Progress is the watchword of its civic administration.

The works now being carried on by the engineering department include the improvement of Columbia street, the principal business thoroughfare, the laying of a 24-inch main trunk sewer, new water and electric light mains and 14-foot cement sidewalks. With the idea of relieving to some extent the glare of the western sun, these sidewalks are finished off with a pleasing terra cotta tint, obtained by the use of oxide of iron. Columbia street is being relaid by the Hassam Paving Company, at a cost exceeding $125,000. Double electric car lines are being put down under the supervision of City Engineer Blackman. The old fashioned wooden trolley posts are being replaced by arc lighted, steel centre poles of handsome design, located between the two sets of rails along the roadway, whilst artistic cast iron standards, capped with clusters of electric lamps, are being erected at a distance of 75 feet apart on the sidewalks. The street is 99 feet wide and is considered one of the best lighted and most attractive thoroughfares in Canada.

The civic officials and the citizens generally at New Westminster are alive to their responsibilities and sensible of the advantages they possess in the way of climate, fertility of soil, transportation and so on. The numerous industries include the Fraser River Lumber Mills (the largest in the world), an up-to-date machine works, railway car building factory, iron foundries, boiler works, cold storage plants, etc.

The city proper includes some 3,000 acres of land rising from the Fraser river in a gentle slope to a plateau of land which is rapidly being covered with well built residential homes. Over three-quarters of a million is being spent this year on this plateau. Needless to say, engineering problems in such a locality are of frequent occurrence. Among the works carried out recently may be mentioned the First street sewerage scheme and the Glen bridge.

The work now in progress includes a new pipe line of 25-inch steel rivetted water main from Lake Coquitlam, 17 miles distant, to the reservoir, from which three miles of 13-inch lap-welded steel pipe will serve the city. The pipe required in this connection was manufactured at New Westminster by Messrs. Macdonald & Company. The size first named is estimated to supply 6,250,000 imperial gallons a day. The source of supply is 442 feet above sea level and the reservoir 254 feet. The cost involved in this undertaking is approximately $378,000.

The contract for the pipe for the Eighth street sewerage system now in hand is being carried out by Messrs. Gardiner & Johnston. This system will serve some 150 acres and is estimated to cost $100,000. The main sewer pipes on this work will extend 10 miles in length. The city is now considering important paving schemes which will involve an expenditure of nearly $150,000. New building by-laws are also being adopted

The city is planned intelligently and the New Westminster of the future will not present the appearance of a city that "just happened." The ground plan is practically that all building blocks are laid out in squares with wide streets and 30-foot lanes throughout. The land slopes down to the Fraser river and has generally a southern aspect. These natural advantages admit of admirable drainage, whilst the swift-flowing current, with all the force of 700 miles of travel, removes all detritus in its passage to salt water some 12 miles distant.

The principal sewer is practically a combination pipe having two storm overflows of respectively 15 inches and 18 inches diameter. The manholes are built of carefully tested concrete and are fitted with penstocks at every opening for the purpose of flushing and to facilitate control of the sewage. All pipes are enclosed in four inches of Portland cement, whilst the surface water is received into trapped cast

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

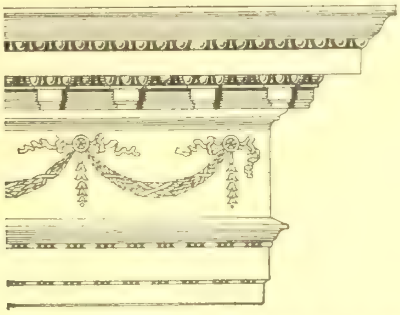
BATTS LIMITED
50 Pacific Avenue - - West Toronto

A good appearance is a letter of recommendation; a building well built, a monument to the builder.

The Philosopher of Metal Town

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.

They are made of sheet copper or galvanized steel and are absolutely rust proof.

"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.

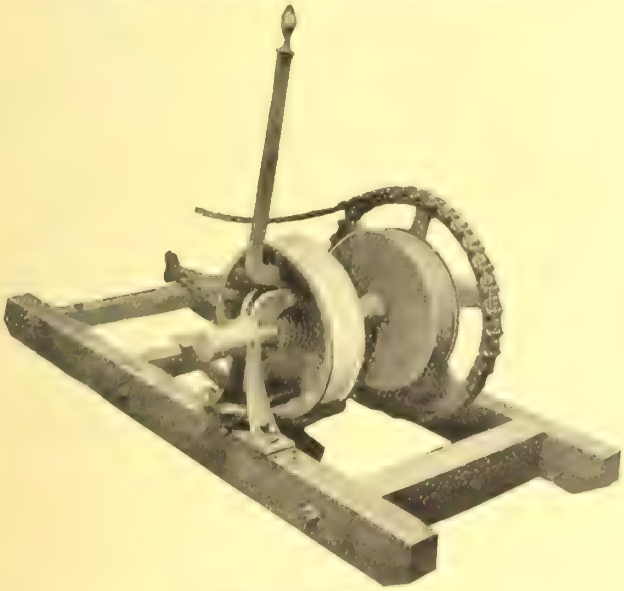
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers

1055

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

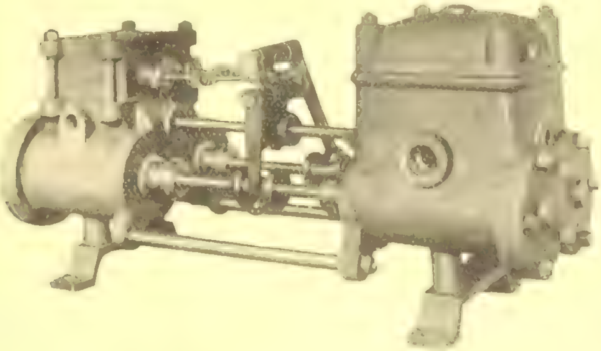
Contractor's Work
Bridge Building
Mortar Conveying
Sewer Building
Well Digging
Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

ten catch basins probably the most approved system of modern sanitation.

While our interest in New Westminster centres around City Engineer Blackman and his work, a circumstance which precludes our entering into other matters connected with the city's administration, it would not be fair to close without acknowledging the services of Mr. C. H. Stewart Wade, the enterprising Publicity Commissioner of the Royal City, who is practically the author of this article.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us enclosing stamped envelope, and stating number of enquiry:

888. Roofing slates and tiles—A London firm wish to enter the Canadian market for roofing slates and tiles, and manufactured slate work.

956. Agent—A Yorkshire company manufacturing paints, colors, varnishes and oils, seek a suitable resident agent in Vancouver.

957. Agents—A Bristol firm desires to get in touch with Canadian firms handling builders' supplies for the sale of mortar mills. Will appoint agents.

981. Cast iron car wheels, electrical goods, etc.—A Newfoundland company usually purchasing their goods in England and the United Sattes, desires Canadian exporters to quote them prices on the following goods: cast iron car wheels, electrical goods, including wire, fixtures, motors, transformers, lamps, etc., track spikes, boiler plates, boiler rivets and nuts, channel and angle iron, gasoline and kerosene oil engines, picks, sledge hammers, shovel handles, brass valves, babbitt metal and solder.

1009. Cement—A Dutch firm wants an agency for Canadian cement.

1119. Agents—A Liverpool correspondent wishes to appoint agents in Canada for the sale of a patent paint for the preservation of stone, brick, wood and metal structures.

1123. Road making specialties—A Liverpool firm manufacturing road making specialties, wishes to arrange for their production and sale in Canada.

The Evils of Substitution

The evils of substitution are set forth in an interesting manner in a recent issue of the New York "Evening Mail." The article in question furnishes such an excellent exposure of the "just as good" methods of some dealers that a substance thereof may prove of interest to our readers.

J. B. was building a house in a country town forty miles from New York. From various advertisements that he had seen he had formed a highly favorable impression of Cabot's creosote shingle stains (Samuel Cabot, Inc., Boston). Upon subsequent investigation he decided to use same. The architest had not specified Cabot's stains but readily conceded that they were the best. But the struggle the owner had to get what he wanted is amusing. The building was well under way and almost ready for the shingles. The builder referred the matter to his painter, who wanted to mix his own stains, which he claimed were the "same thing," "just as good," and so on. This would give him an extra profit on the job, which, however, he did not mention. The owner was told that it would take two or three weeks to get Cabot's stains from Boston, whereas the painter could mix his own stuff and proceed with the work at once. The local dealer preferred to sell another make which he considered "just as good," omitting, of course, to mention the extra discount that he would obtain on the substitute article. J. B.'s resolution, however, was only strengthened by all this oposition that he encountered. In the end he placed an order for 150 gallons of Cabot's stain and obtained delivery in four days. The stains were applied and J. B. has every confidence in their durability. "My faith in their claims is strong," he concludes, "but how many home builders know enough of the guaranteed qualities of Cabot's shingle stains to insist upon having them as I did?"

All of which goes to show the value of advertising. No matter what merits your product may have, it may be asserted without fear of successful contradiction that in these days nothing can succeed without a fair share of publicity. The more advertising the less danger from substitution. There are many people who try to thrive by substituting—and the the worst of it is that many of them **do** thrive—but most people are beginning to understand that an advertised article of merit is the cheapest and most satisfactory they can purchase.

"Good morning, madam," volunteered the cheery salesman.

"Good morning," echoed the pleasant-looking matron. "Have you something choice in real Irish lace?"

"Well—er—no; but here is something just as good at 75 cents a yard."

"Just as good?" doubtfully.

"Yes, indeed. In fact," confided he, "superior to the real article. How much do you wish, please?"

"Just a yard," with suspicious slowness. "Here's your money."

"But, madam," in confusion, "you have made a mistake. This isn't money."

"No?" agreeably.

"Why, no. It's a matinee ticket."

"So it is. But it represents 75 cents, and while it isn't actual money, it's just as good."

And the salesman collapsed.

Dr. C. A. Hodgetts left Toronto last week for Ottawa to take up his duties as public health and sanitation expert for the Conservation Commission.

The death occurred last week of Mr. Donald Grant, formerly a well known contractor of Windsor, Ont. Several years ago he moved to Chicago, returning to Windsor about six months since.

The shortage of labor in Winnipeg is reported to be so great that contractors are offering as much as $2.25 and $2.50 a day. On railroad work some of the men are making $3 a day with a little overtime.

The City Council of Prince Rupert, B.C., is adopting a frontage tax system for all work on city streets. A start on the street work will be made almost immediately. The business district will be put in first class shape this season.

A recent despatch from Seattle states that a representative of Klaw & Erlanger is on the coast in connection with the erection of a theatre in each of the principal cities. Edward G. Cooke, their agent, will visit Vancouver shortly and will make arrangements for the early construction of a handsome theatre there.

Mr. J. H. Plummer, president of the Canadian Steel Corporation, which is the title of the new steel and coal merger, states that the concern over which he presides has no intention of building any new mills, as was reported. Asked as to the intention of the corporation to go into the wire nail business he replied in the negative.

Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our Prices on our

Concrete Reinforcement

Continuous lengths or in sheets cut to size

CANADA WIRE GOODS MFG. CO.

Hamilton

AUTOFORCE VENTILATING SYSTEM

(Patented)

Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA:

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read **The Cement Era.** The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.

1800 Monadnock Block - - CHICAGO

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless, fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc. has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.

CUT STONE

All kinds of Canadian and American Stone

D. ROBERTSON & CO.

Limited

Offices:
[illegible] Yonge Street, TORONTO
MILTON, Ont.

Yard
Manning and Dupont TORONTO

Quarries:
MILTON
CREDIT FORKS

Telephones
[illegible]
[illegible]

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

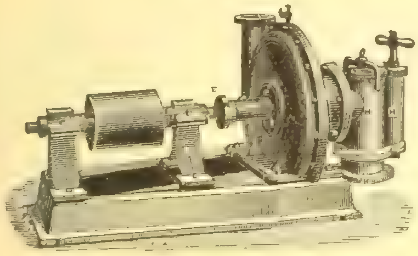
Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

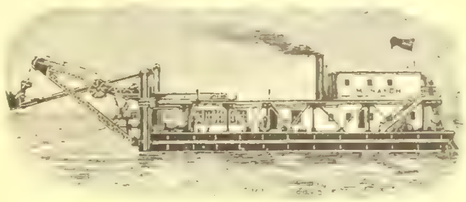
M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

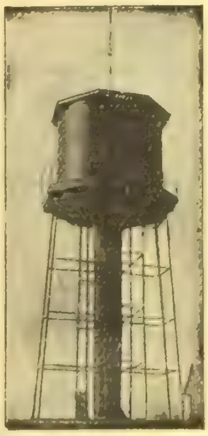
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Steel Bridge Contractors

Structural Steel Contractors

SPECIFICATIONS SOLICITED

Corbet Foundry & Machine Co., Owen Sound, Ont.



Steel and Wood TANKS

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

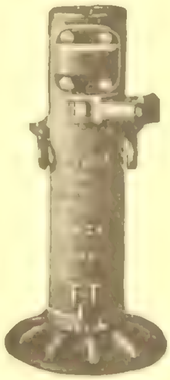
Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company Montreal



S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF
GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS
We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

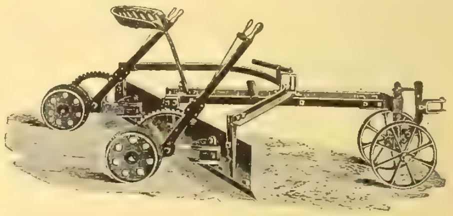
The Enamel that Stays White
SATINETTE
Exterior White Enamel Gloss

Outside work exposed to varying temperature and the elements demand an extremely elastic white enamel finish. Satinette exterior White Enamel is specially prepared for this purpose. It works with great freedom—dries with a hard clear lustre and is noted for its durability.
Satinette dries hard like porcelain and is both sanitary and durable.

All Packages are full Imperial Measure

INTERNATIONAL VARNISH CO.
Limited
Toronto Winnipeg
2507

Climax Handy Reversible
Road Grader
Giving Satisfaction in all Localities



The following is an extract from a letter received from A. T. Stephenson, Commissioner of Red Deer:—

Red Deer, Alta.
April 15th, 1910

"I enclose herewith cheque to cover grader. I may say that we have used the machine for several days on our streets and it is the machine we have long needed for keeping the roads and ditches in repair. We are well pleased with it and I am sure that when some of the councillors for Local Improvement Districts see it work they will get some. We use a plow on the side of the road and throw up three or four furrows, then use the machine and grade to the centre, afterwards going over and picking up loose stones. We use the town team and they handle it without difficulty."

For Prices Apply to
Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX L. GARTSHORE, Treasurer.

THE CARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers
Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter
for Water, Gas, Culvert and Sewer
HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

SUCCESSORS TO:
Canadian Iron & Foundry Co., Limited
Canada Iron Furnace Co. Limited
Annapolis Iron Co., Limited
John McDougall & Co., Drummondville

Head Office: Montreal, P. Q.

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc. Castings of All Kinds.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

THE WARMEST SHEATHING WIND AND FROST PROOF

Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Central Supply Co., Regina

ROCALITE

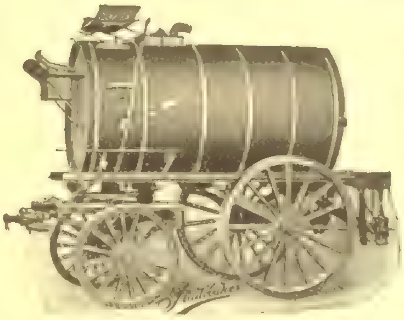
The Ready Mixed

Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

STREET SPRINKLERS



Studebaker Sprinklers manufactured by us do not clog or get out of order. Greatest width of spray. Can be graded from driver's seat to any volume.

Get our prices on street sweeping machines.

Geo. Heaman, London, Ontario

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U.S. Letters Patent.

Toronto Canada

Sand and Gravel

We can supply you with sand and gravel, screened, Pip Run and Pea Gravel

Building Sand

Let us quote you on your next job

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North { 2107 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**

London, Canada Limited

Toronto Office: 103 Pacific Bldg.

Globe Furniture Co., Limited

Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

Send Plans and Specifications for Estimates

The

Globe Furniture Co., Limited

Toronto Office: 90 Yonge St.

Phone Main 5944

Main Office and Factory: Walkerville, Ont.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.

Corinthian Stone

is used by
Canadian Architects for Canadian Buildings

is made by
Canadian Workmen with Canadian Materials
Canadians should write for prices to

THE CORINTHIAN STONE CO.
G.T.R. Junction, Guelph

55%
WATER WASHED SAND
Registered
PURE SILICA

Sand & Supplies, Limited
Main 4507 - - TORONTO

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

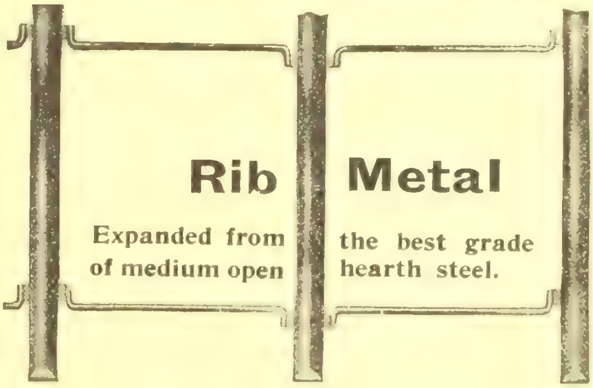
Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



Rib Metal

Expanded from the best grade of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman Geo. H. Power.

A. LEOFRED

(Graduate of Laval and McGill)

Civil Engineer

Specialty : **Waterworks**

39 St. John St., QUEBEC Telephone Bell 545.

DAVIS & JOHNSTON

CIVIL ENGINEERS

WATER WORKS, SEWAGE
and SEWERAGE DISPOSAL

Wm. Mahlon Davis, M. Can. Soc. C.E.
Herbert Johnston, C. E. Assoc. M. Can. Soc. C. E.

Office : BERLIN

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

Waterworks, Sewerage and Electric Plants
Concrete and Steel Bridges and Buildings

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

Consulting Engineer

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and
HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

---

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, **Toronto**

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

Frank Barber, York County Engineer.
C. R. Young, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, **Toronto**

The John Galt Engineering Co.

CONSULTING CIVIL AND
SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The
KATIE
Foundry,
Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown

Roof Trusses and Girders

Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

Office and Works :

Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING
and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work .. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	...	17,50
Brass Goods, Valves, etc.		
96 to 100 "	.. .	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.
Floor Tile—½-inch square 65 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, firsts 70 cents.
Capping Coves and corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 8 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 8 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 87½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.
Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.80 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, 95 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 92 cents per gallon of 9 lbs.
Turpentine, in barrels, 85 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

[illegible] & Co., [illegible], [illegible], Que., [illegible] to have dissolved.

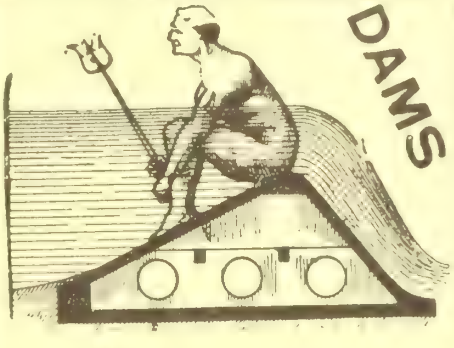
J. W. [illegible], [illegible], Asquith, Sask., has sold to R. G. Fletcher.

It is reported that Marchessault & Mor[illegible], Montreal, Que., [illegible].

[illegible] & [illegible], [illegible], Montreal, Que., are stated to have dissolved.

[illegible] incorporation of the following companies: [illegible], Limited, capital $500,000; the Whitney Engineering Company, incorporated, capital [illegible] 000; Imperial Power Company, Limited, [illegible], capital $100,000; Pacific Waterworks Company, Limited, capital $25,000; the Bull River Electric Power Company, Limited, [illegible] Metal Works, Limited, capital $10,000; the Wood Motor and Taxicab Company, Limited, capital $50,000.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**

AMERICAN

ALSEN

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

GERMAN

Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections

See page 155 in "Sweet's" for full particulars.

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co.
Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

TRUE ECONOMY

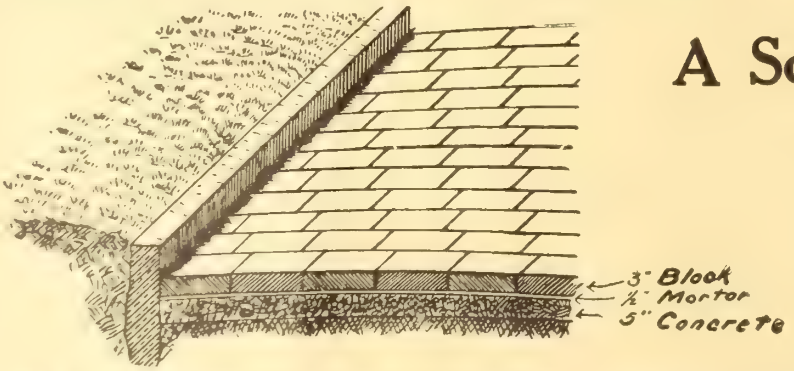
involves the use of the best available materials in your business. On this account, wise contractors are specifying **GREENINGS** when ordering such things as

Wire Rope, Trussed Steel Wire Lathing
Reinforcing Wire Gravel Screens
Wire Guards, Chains

These goods are made in Canada's oldest and best equipped wire drawing, wire weaving, wire rope making and metal perforating mills. Every article is guaranteed perfect in material, workmanship and finish.

Catalogs on request

The B. Greening Wire Co.
Hamilton, Ont. Limited Montreal, Can.



A Scientific Pavement

must be

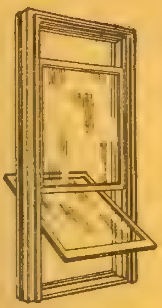
Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.



Fireproof Windows

Be Sure Your Window has an Underwriter Label

It is easier to prevent a disastrous fire than it is to stop one.

The weak point in all buildings is through the windows.

These openings can be made fireproof as the walls themselves by installing the **Douglas Fireproof Window.**

Printed matter, descriptive and illustrative, on request.

Douglas Brothers
LIMITED
Toronto, Ont. Montreal, Que.

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Cast Iron Fittings

ALL SIZES

For Steam, Gas,
Oil and Water

Standard Flanged Fittings

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

For 125 or 250 pounds working pressure.

The only factory in Canada devoted exclusively to Cast Iron Fittings.

MANUFACTURED BY

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

WIRE ROPE

When you require Wire Rope for any purpose, it will most certainly pay you to communicate with us. We carry the largest stock in Canada and can give you immediate shipment of almost any length in any size for every requirement.

We make a specialty of High Grade Dredge and Steam Shovel Cables and also make Wire Ropes to suit any special requirement.

Every rope is made from the best quality of imported wire, specially drawn to our own specification, and no expense is saved to carefully test each coil for its tensile strength, torsion, flexion and elastic limit.

Wire Ropes for hoisting, elevators, guys, semaphores bridges, towing, haulage, transmission, etc., always in stock.

Let us quote you

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **E. A. Earle & Co., Vancouver**

Vol. 24 Toronto, July 13, 1910 No. 28

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Neptune Meter Co.

Manufacturers of the well-known

**TRIDENT
Frost-Proof
Water
Meters**

Write for Catalogue

Main Office - 90 West Street
New York City

"MADE IN CANADA"

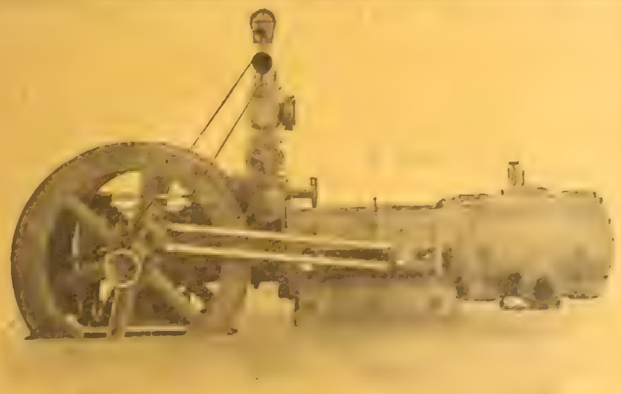
Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited

(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO



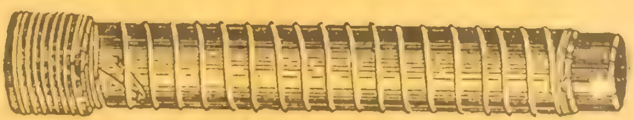
CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity Efficient Regulation
Large Bearings Rigid Construction

Ask for Descriptive Catalog K-51

CANADIAN RAND CO., Limited

Commercial Union Building, MONTREAL, QUE
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited

P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices: **Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver**

$20,000,000.00!

The "Rockwood" Approved by all Canadian [illegible] Insurance Associations

**Canada's Annual Fire Loss.
What Proportion Do You Pay?**

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums
For particulars and free estimates communicate with

The Rockwood Sprinkler Co., of Canada, Limited, Montreal

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office:

Montreal

Sales Offices

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Automatic Sprinklers Page
Rockwood Sprinkler Co. 2

Architectural Iron Work
Canada Wire Goods Mfg. Co. 15
Dennis Wire & Iron Works 58

Boilers
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 52
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co. 13
Waterous Engine Works Co.

Brick
American Enamelled Brick Co.
Canadian Pressed Brick Co. 10
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co. 16
Port Credit Pressed Brick Co. 16
Toronto Pressed Brick Co.

Bridges (Steel)
Canadian Bridge Co. 54
Cleveland Bridge Co. 54
Dickson Bridge Works
Dominion Bridge Co. 54
Phoenix Bridge and Iron Works 55
Pennsylvania Steel Co. 54

Builders' Hardware
Taylor-Forbes Co. 13

Cement
Alsen Portland Cement Co. 62
Bennell & Co. 58
Bromner, Alex 57
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 60
Rogers, Alfred 4
Rogers Supply Co. 31
Sand and Supplies 59
Stinson-Reeb Builders Supply Co. 58

Conduits Page
Conduits Co., Limited 58

Concrete Mixers and Machinery
Canada Foundry Co. 14
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F. H. 64
Jenckes Machine Co. 2
London Concrete Machinery Co. 21
Mussens Limited 32
Morrison & Co., T. A. 60
Rogers Supply Co. 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co. 55
Canada Wire Goods Mfg. Co. 15
Hamilton Iron & Steel Co.
Trussed Concrete Steel Co. 59

Contractors' Plant
Beatty & Sons, M. 55
Hepburn, John T. 17
H. & E. Lifting Jack Co.
Hopkins & Co., F. H. 64
Katie Foundry Co. 60
Marsh & Henthorn 52
Mussens Limited 32

Crushers (Stone and Rock)
Hopkins & Co., F. H. 64
Jenckes Machine Co. 2
Mussens Limited 32
Morrison & Co., T. A. 60

Corrugated Iron
Galt Art Metal Co.
Metallic Roofing Co. 53
Metal Shingle and Siding Co. 20
Ormsby, A. B., Limited 5
Roofers Supply Co. 51

Contractors Page
McIlwraith, Jas. A. 60

Drills
Beatty & Sons, M 55
Canadian Rand Co. 1

Drilling Contractors
Harvey, J. 61

Dredges
Beatty & Sons, M 55

Engines
Inglis, John 22
Jenckes Machine Co. 2
Mussens Limited 32
Waterous Engine Works Co.

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co. 34

Engineers (Civil and Mechanical
Barber & Young 60
Chipman, Willis 60
Bowman & Connor 60
Davis & Johnston 60
Farmer, John T. 60
Fuce, Edw. O. 60
Galt & Smith 60
Hunt & Co., Robt. W. 59
Inglis, John 22
Leofred, A. 60
Lea & Coffin 60
Mitchell, C. H. 60
McRae, John B. 60
Moore & Scollon 60

Fire Apparatus Pag
Morrison & Co., T. A. 62
Seagrave, W. E. 58

Fireproof Doors and Windows
Douglas Bros. 63
Mussens Limited 32
Ormsby, A. B. 5

Granite and Marble
Laurentian Granite Co. 60
Missisquoi Marble Co.
Rogers Supply Co. 31
Smith Marble & Construction Co.

Glass
Chance Brothers & Co. 8
Consolidated Plate Glass Co.
Luxfer Prism Co. 5
Thompson & Co., B. & S. H. 8
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E.
Taylor-Forbes Co. 13

Hoisting Machinery
Beatty & Sons, M. 55
Inglis, John 22
Jenckes Machine Co. 2
Hopkins & Co., F. H. 64
Marsh & Henthorn 51
Mussens Limited 32
Scott Machine Co. 5

Hydrants
Canada Iron Corporation 57
Gartshore-Thompson Pipe Co. 56
Kerr Engine Co.

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co. 55

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

General Sales Offices:
PHONE MAIN 4345 306-307 Stair Building, TORONTO

50 Different Angles
To Solve
50 Different Problems

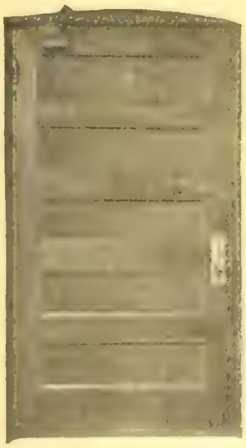
With one, or a combination of these angles **Luxfer** solves every problem of daylighting that is capable of solution.

If your client has a warehouse or store requiring more daylight to show goods in their proper color and quality, bring your problem to us.

That's what LUXFER is for

Luxfer-Prism Company, Limited
100 King Street West, TORONTO

We have 50 Kalameined Clad Fireproof Doors in the Traders Bank Building, Toronto



They mean a **big reduction** in their **Insurance Rates.** They have **artistic,** as well as **Fireproof Doors,** something in keeping with the building.

Specify a Kalameined Clad Door that has this artistic appearance, that is the ORMSBY "UNDERWRITERS" made to any detail, and made without any bulging between the wood and the iron.

Let us give you an approximate figure.

A. B. ORMSBY, Limited
Factories
TORONTO and WINNIPEG
Experts in Fireproof Windows and Doors

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish Page
[illegible]
[illegible]
DeLaplante, Ltd. 20
Eaton & Sons, J. R. 21
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

Metal Lath
[illegible]
[illegible]
[illegible] 20

Meters
Hopkins & Co., F. H. 64
[illegible] Meter Co. 1

Paving and Paving Materials
[illegible] Works
[illegible] Paving Brick Co. 15
Ontario Asphalt Block Co. 62
Silica Barytic Stone Co., of Ontario 61

Plaster
Albert Mfg. Co. 13
[illegible] & Co. 58

Pipe
Canadian Pipe Co. 56
Dominion Wood Pipe Co. 9
[illegible] Pipe Co. 56
[illegible] Construction Co. 17
National Iron Works 57
Pacific Coast Pipe Co. 1
[illegible] People 16

Power Engines
Inglis Co., John 22

Paints and Varnishes
[illegible] 57
[illegible] Varnish Co.
International Varnish Co. 56
Paterson Mfg. Co.

Pile Driving Page
Lincoln Construction Co. 58

Pumps and Pumping Machinery
Beatty & Sons, M. 55
Goulds Pump Co. 13
Hopkins & Co., F. H. 64
Inglis Co., John 22
Martin Steam Pump Co.
McDougall Caledonian Iron Works, John 31
Mussens Limited 32
Ontario Wind Engine & Pump Co. 55
Smart-Turner Machine Co.
Waterous Engine Works Co.

Roofing Materials
Barrett Mfg. Co.
Brantford Roofing Co. 11
Galt Art Metal Co.
Metallic Roofing Co. 53
Metal Shingle & Siding Co.
Noble, Clarence W. 20
Rogers Supply Co. 31
Roofers Supply Co. 52

Railway Supplies
Gartshore, John J. 60
Hopkins & Co., F. H. 64
Mussens Limited 32

Road Machinery
American Road Machinery Co. 14
Case Threshing Machine Co. 19
Climax Road Machine Co. 56
Morrison & Co., T. A. 60
Mussens Limited 32

Sewer Pipe
American Sewer Pipe Co. 18
Britnell & Co. 58
Canada Iron Corporation 19
Dominion Sewer Pipe Co. 18
Gartshore-Thomson Pipe Co. 18
Hamilton & Toronto Sewer Pipe Co. 19
National Iron Works 57
Ontario Sewer Pipe Co. 10
Rogers Supply Co. 31
Standard Drain Pipe Co. 18
Toronto Pottery Co. 18

Sand
Rogers Supply Co. 31
Sand & Supplies 57

Stone Page
Britnell & Co. 54
Christie, Henderson & Co. 17
Consolidated Stone Co.
Contractors' Supply Co. 52
Corinthian Stone Co. 15
Crushed Stone, Limited 59
Doolittle & Wilcox 57
Hagersville Contracting Co. 5
Laurentian Granite Co. 69
Maloney, John 54
Morrison & Co., T. A. 60
Myers, Oakley 59
Robertson, D. 59
Rogers Supply Co. 31
Roman Stone Co. 17
Sackville Freestone Co. 15
Sand and Supplies 59
Wiarton Stone Quarry 59

Structural Iron and Steel
Buffalo Steel Co. 55
Corbet Foundry & Machine Co. 55
Dominion Bridge Co. 54
Hamilton Iron & Steel Co.
MacKinnon Holmes & Co.
Pennsylvania Steel Co. 54
Phoenix Bridge & Iron Works 55
Queen City Foundry Co. 60
Reid & Brown 60

Shovels (Steam)
Beatty & Sons, M. 55
Hopkins & Co., F. H. 64
Mussens Limited 32

Street Sprinklers
Heaman, Geo. 57

Slate
Roofers Supply Co. 52

Steel Shingles and Ceilings
Galt Art Metal Co.

Safes and Vaults
Taylor, J. & J. 55

Telephone Supplies
Northern Electric & Mfg Co. 34

Tiles
Smith Marble & Construction Co.

Tanks and Stand Pipes
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 52
McDougall Caledonian Iron Works 31
Ontario Wind Engine & Pump Co. 55

Typewriters
United Typewriter Co. 62

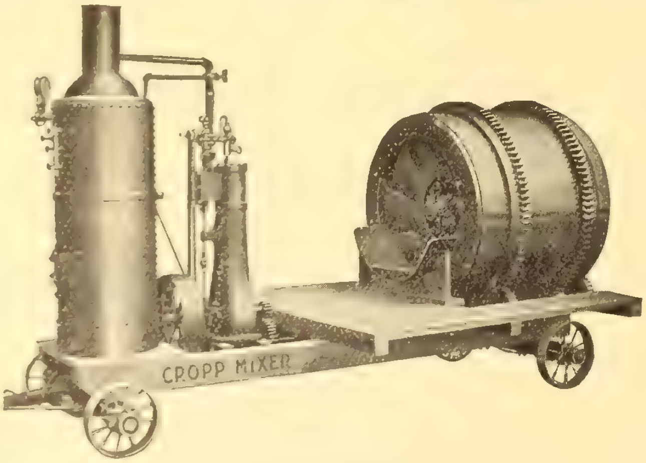
Valves
Canada Iron Corporation 57
Gartshore-Thomson Pipe Co. 56
Kerr Engine Co. 8
Standard Fitting & Valve Co. 63

Ventilating System
Gardiner & Gaskill

Wire Rope
Dominion Wire Rope Co. 64
Greening Wire Co., B. 56
Smith, Thos. & Wm. 12

Wire Fences and Screens
Canada Wire Goods Mfg. Co. 15

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Don Valley Bricks

are made in every imaginable style, and shape. Any color scheme or design may be effectively worked out with our bricks.

The following is a partial list of our products :

BRICKS

- Pressed Bricks (over 130 different shapes)
  Red, Buff, Brown, Old Gold, Olive Green, etc.
- Enamelled (over 20 colors)
- Vitrified
- Porous Terra Cotta
- Wire-cut
- Velvet Finish
- Clinker, etc.

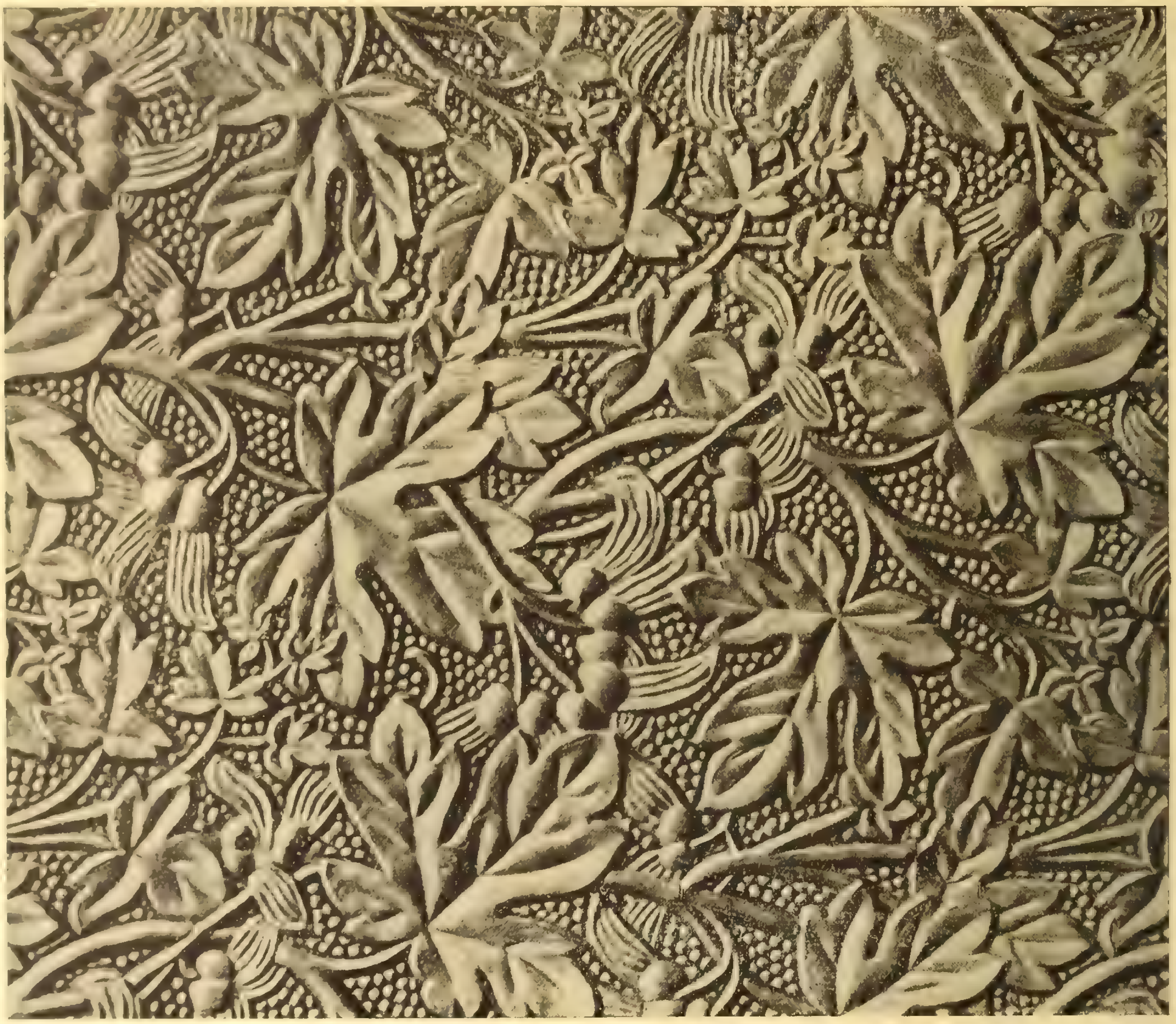
FIREPROOFING

- Column Covering (Square or Circular)
- Arches
- Blocks (eight stock Sizes)
- Furring
- Flooring
- etc.

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO
Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Chance's Famous Figured Rolled Glass



(Registered No. 545694)

To Architects, Builders and Contractors we will send, on request, samples of the Glass manufactured by CHANCE BROS. & CO., Limited, near Birmingham, England. Samples include Figured Rolled, Muffled and Rolled Cathedral Glass, in a variety of patterns and tints.

The "Maple Leaf" pattern, shown above, is one of our newest and most popular.

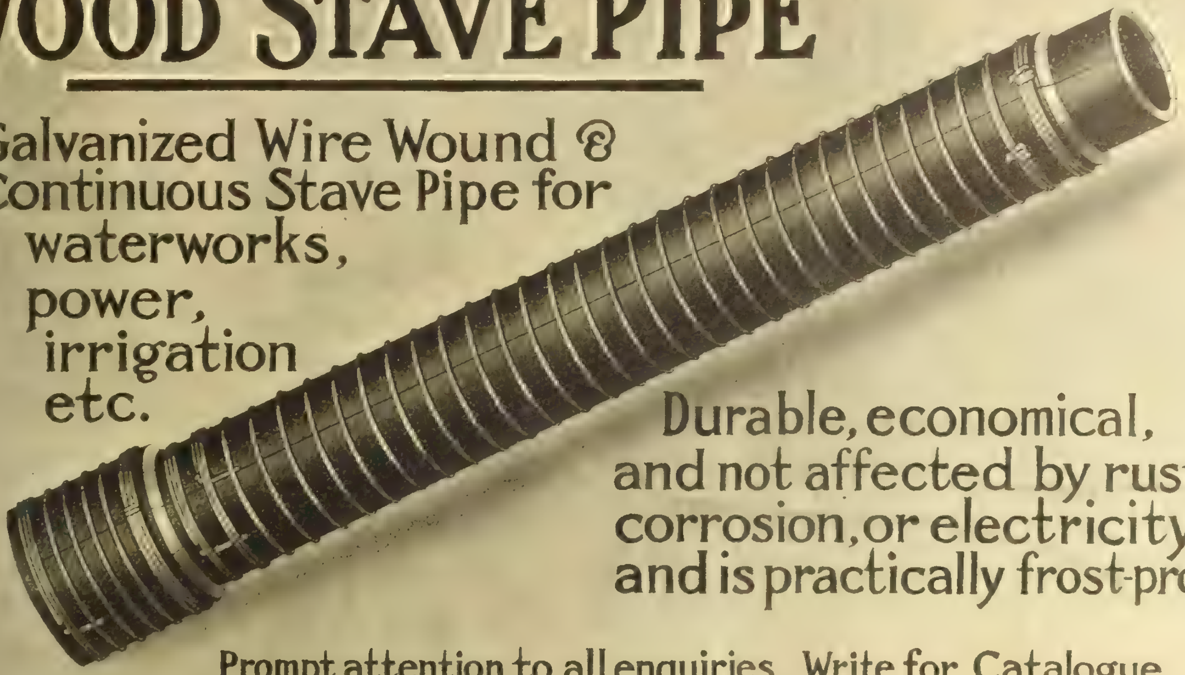
Write now for these samples. You'll probably find among them just the glass for which you have been looking.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

WOOD STAVE PIPE



Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

When You Want Good Sewer Pipe

Don't forget that there is one place where you will be sure of the **best** article and the very best treatment.

Drop a line to

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

"MIMICO" Pipe Makes the Sewer Sure

Why Shingle a House when Brantford Roofing is better

Many builders and contractors, who have made a close study and inspection of the different classes of roofing materials on the market, recommend Brantford Roofing for use on dwelling houses as well as on factories and stores.

They do so, because Brantford Roofing makes a neat and attractive appearance on the roof ;

Because Brantford Roofing makes a perfectly watertight roof ;

Because Brantford Roofing will not melt in summer or turn brittle and crack in winter ;

Because Brantford Roofing is fire-resistant ;

Because Brantford Roofing is more than TWICE as durable as wooden shingles, yet costs no more.

Send for our big roofing booklet. It gives valuable facts about roofing materials.

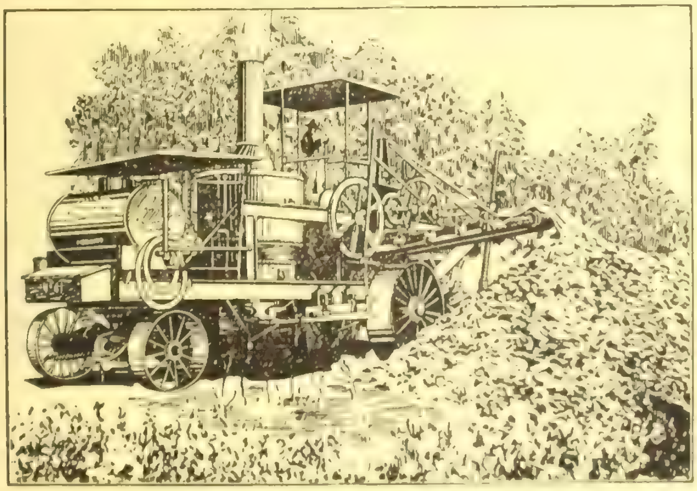
Also ask us for samples of Brantford Roofing.

Brantford Roofing Company, Limited
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.
MONTREAL

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

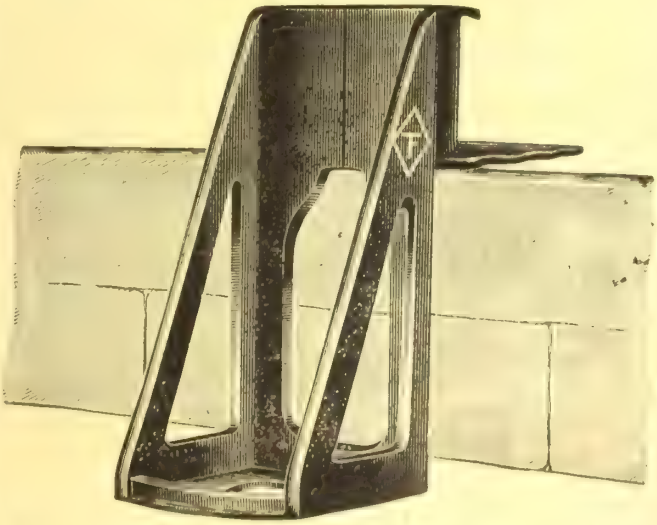
including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

Builders' Joist Hangers
ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

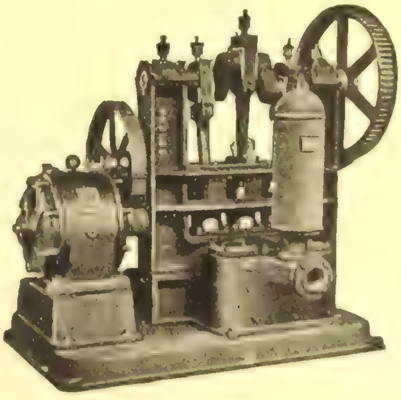
We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished
TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

Goulds Efficient Power Pumps

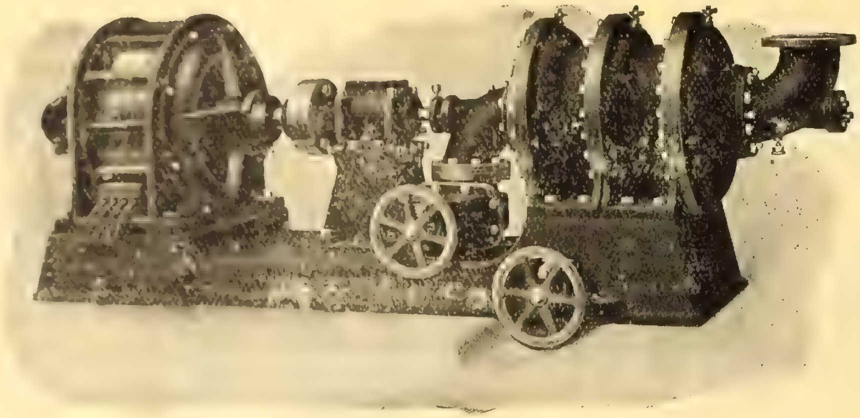
Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.
Coristine Building, **Montreal**
Phone Main 1054
Works: Seneca Falls, N.Y.

Turbine Pumps



Single and Multiple Stage

Low Cost of Installation

Simple in Construction and Maintenance

Effecting Great Saving in Space and Cost of Installation

Canada Foundry Company, Limited

Head Office, TORONTO

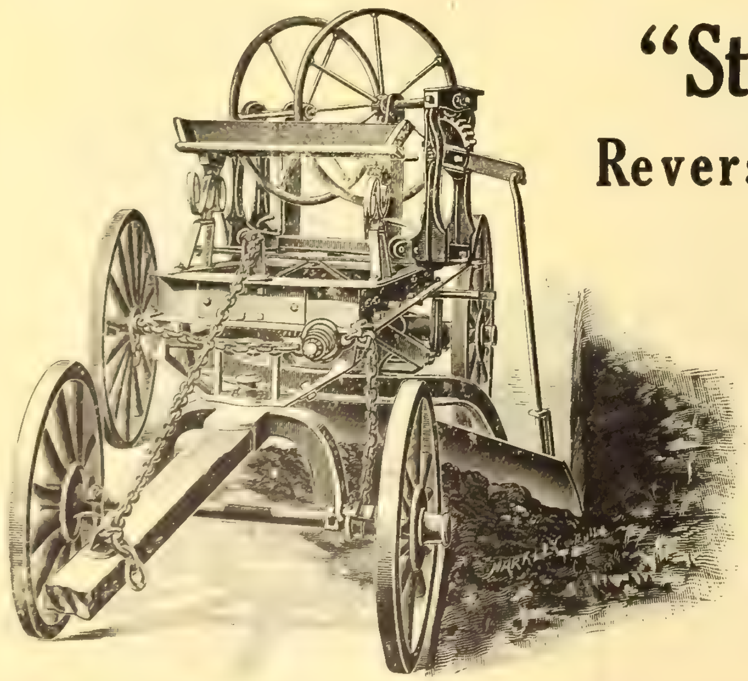
Montreal Halifax Ottawa Winnigeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery

Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our Prices on our

Concrete Reinforcement

Continuous lengths or in sheets cut to size

CANADA WIRE GOODS MFG. CO.

Hamilton

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone

can only be procured from, and
is manufactured solely by the

Corinthian Stone

Company, Guelph

from the hardest substances available

Write the

Corinthian Stone

Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc. has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.

CUT STONE

All kinds of Canadian and American Stone

D. ROBERTSON & CO.

Limited

Offices
75 Yonge Street, TORONTO
MILTON, Ont

Yard
Manning and Dupont, TORONTO

Quarries
MILTON
CREDIT FORKS

Telephones
Toronto M [illegible], C [illegible]
Milton [illegible]

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of obsorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

Canadian on every Brick

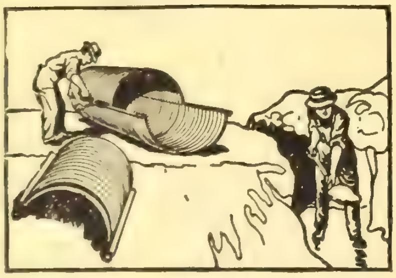
We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

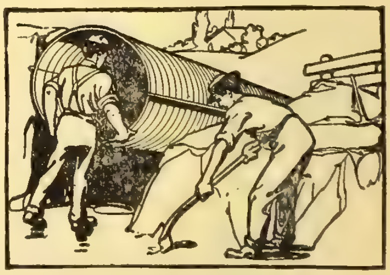
Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.



PEDLAR
NESTABLE GALVANIZED
CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivelled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

HALIFAX 16 Prince St.
LONDON 86 King St.
WINNIPEG 76 Lombard St.
MONTREAL 321-3 Craig St.
PORT ARTHUR 45 Cumberland St.
OTTAWA 423 Sussex St.
TORONTO 111-113 Bay St
CHATHAM 200 King St. W.
QUEBEC 127 Rue du Pont
REGINA 1901 Railway St. S.
CALGARY 1112 First St. W.
VICTORIA 434 Kingston St.
ST. JOHN N.B. 42-46 Prince William St.
VANCOUVER 821 Powell St.

The Municipal Construction Co.

Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

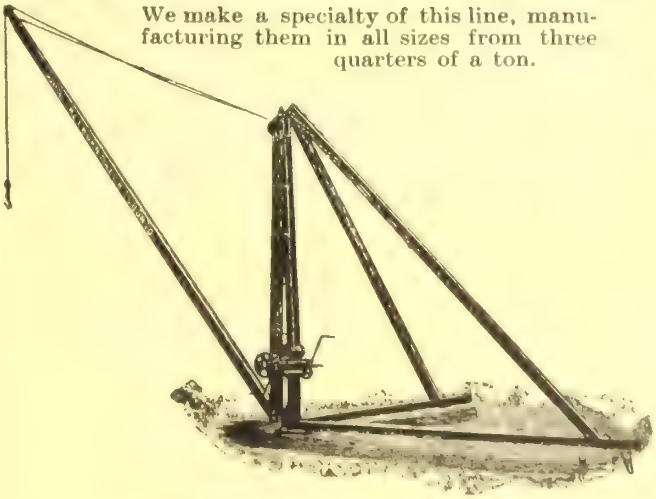
Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds

Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

Sewerage Acids do not affect the

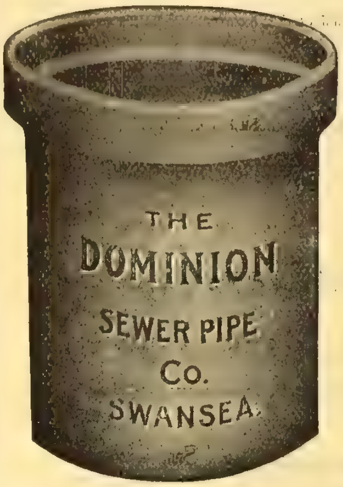
Sizes 3 in. to 36 in.

The Standard for Quality in the United States and Canada

Fancy shapes in Chimney Tops, Fire Clay Stove Pipe and Fittings, Wall Coping, Fire Clay Flue Liners, Fire Brick and Fire Clay.

The Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Glazed Earthenware
in the world.

Sewer Pipe

Single and Double. Strength, 3″ to 36″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

CANADIANS, ATTENTION!

IT PAYS TO PAY FOR QUALITY

Fifty years successful
experience in the past

PIONEERS

PIONEERS

1860

1910

PIONEERS

PIONEERS

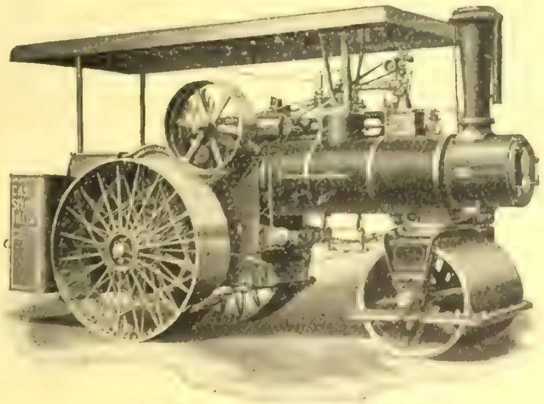
Fifty years of future progress

THE PIPE THE PEOPLE PREFER

The Hamilton & Toronto Sewer Pipe Co., Limited

Hamilton and Toronto

The Only Spring-Mounted Road Roller Built



Case 30 Horse Power, 10-ton Road Roller

**Time price, with Simple Cylinder,
$2,200; with Compound Cylinder, $2,300**

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description
Guaranteed to do all or Anything that can be done by Any Other Make or
Design of Road Roller

**We sell the well known line of Troy
Dump Wagons and Dump Boxes**

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba, Calgary, Alberta, Regina,
Saskatchewan, Toronto, Ontario

Send for our Contractors General Purpose Engine and Municipal
Tractor Catalog 26

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

Contract Record
Architect & Builder

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, Confederation Life Building, Toronto.

Interior of "Men's Own" Winnipeg—John Atchinson, Architect.
Herringbone Lath and Perfection Studs Used Throughout.

Herringbone Metal Lath

with Perfection Studs make the best fireproof partitions known. Like all fireproof partitions they expand in a fire. Unlike all others, they buckle, but do not crush. "Some Facts" a book about it sent you on request.

CLARENCE W. NOBLE
GENERAL SALES AGENTS
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

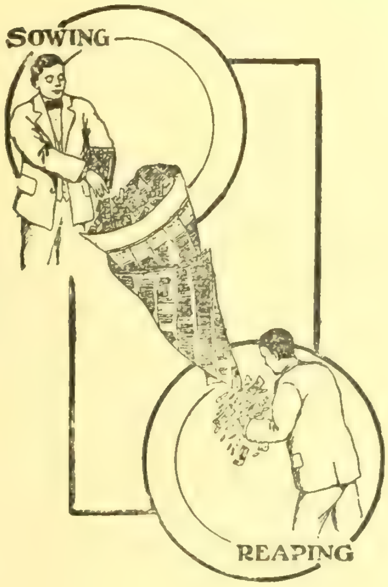
ZINC ORNAMENTS

An extensive range to select from. Special designs made to order on short notice

Every little while we make new additions to our already extensive range of zinc ornaments. This class of work is a specialty with us and we have originated many exceptionally handsome ornaments for use in connection with outside cornices, pilasters, capitals, pediments and other purposes. We have unsurpassed facilities for doing special work on short notice. When figuring on a contract calling for zinc ornaments it will pay you to consult us for suggestions.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Montreal, P.Q. PRESTON, ONTARIO

Fertile Ground



The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

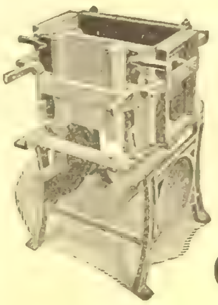
This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

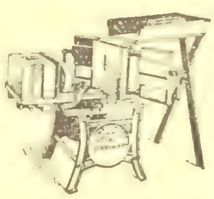
Everybody knows "The Record"

Contract Record

Toronto - Canada



"London"
Face-down
Adjustable
Concrete Block Machine



The MOST COMPLETE EQUIPMENT EVER OFFERED IN ANY HIGH GRADE BLOCK Machine. PRICE ONLY $[illegible] WHY PAY AN EXHORBITANT PRICE FOR BLOCK MACHINE making only one width of wall when you can purchase a HIGH-GRADE ADJUSTABLE MACHINE making ALL SIZES AND STYLES of blocks for all widths of walls at a moderate price. OUR MACHINES ARE FULLY COVERED BY PATENTS. WE CAN SAVE YOU MONEY. Write us for full particulars.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Molds, Sill Molds, Ornamental Molds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent,	Geo. B. Oland & Co.	A.G. Brown & Co.,
52½ Princess St.,	28 Bedford Row,	1048 Westminster Ave.,
Winnipeg, Man.	Halifax, N. S.	Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is [illegible] inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilpting the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horrow.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

Please Send for Samples and Prices

J. R. Eaton & Sons

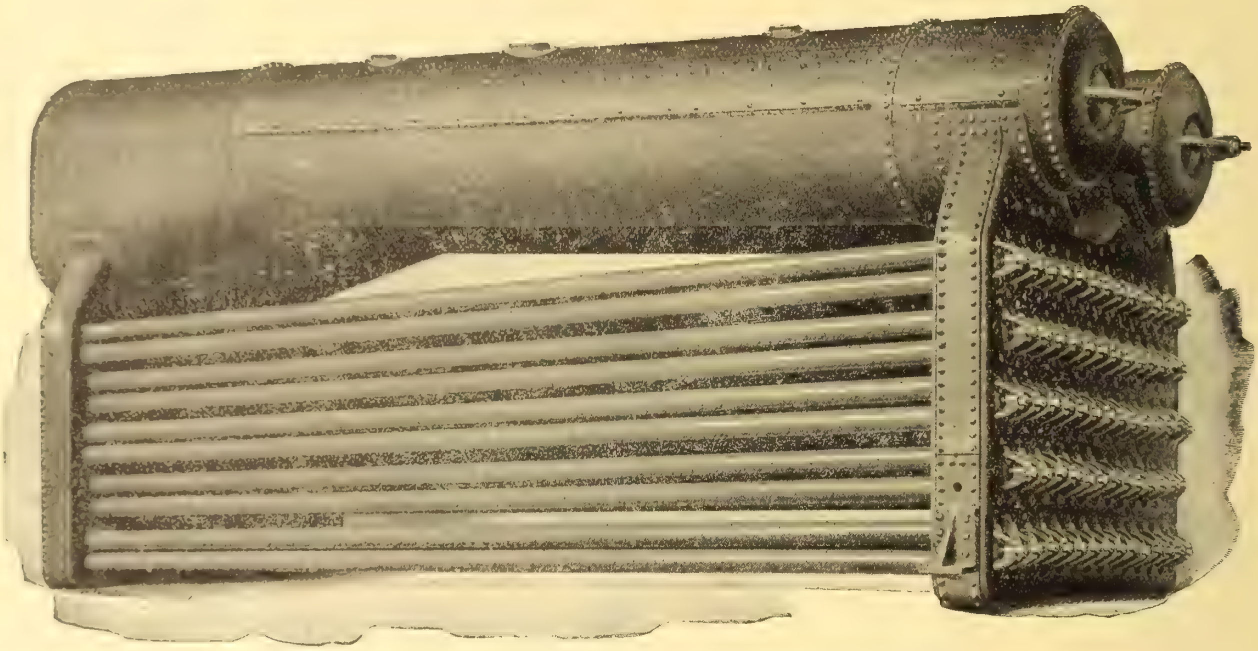
Orillia, Ontario

Montreal Agent: THE HARDWOOD [illegible] CO.
[illegible] St. [illegible]

Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brampton, Ont.

$2,187 will be spent on street improvements.

Cochrane, Ont.

This municipality is offering for sale $25,000 of sidewalk debentures. F. J. Bradley, clerk.

Harriston, Ont.

Tenders addressed to W. D. McLellan will be received until July 27th for construction of drain, etc. For further information see advertisement in "Tenders and For Sale Department" of this issue.

London, Ont.

Tenders will be received until July 14th for re-surfacing asphalt pavement on Dundas street, from Wellington to Ridout. A. O. Graydon, city engineer.

Moncton, N. B.

Tenders for water pipe were as follows: Sumner Company, $1,474.37; Canada Iron Corporation, Limited, $1,477.17; D. Y. Stewart and Company, Limited, $1,410; Watson, Jack and Company, Montreal, $1,373.95. The tender or Watson, Jack and Company was recommended for acceptance. The engineer was authorized to purchase 12 electric metres from the Packard Electric Company.

New Westminster, B. C.

Tenders addressed to W. A. Duncan, city clerk, will be received until August 1st for supply of 1,000 feet of 13-inch dia. and 1,200 feet of 12-inch dia. lap-welded steel pipe, and for 13-inch dia. flexible joints. Specifications, etc., with city engineer, J. W. B. Blackman.

Ottawa, Ont.

Tenders addressed to chairman, Board of Control, will be received until July 14th, for asphalt and stone set pavement on Wellington street, etc. Specifications at office of City Engineer, N. J. Kerr.

Prince Albert, Sask.

It was decided to submit a by-law to the ratepayers asking for $12,000 for purchase of filtration plant, that amount being sufficient to procure a plant through which 600,000 gallons of water per day could pass.

Point Grey, B. C.

For constructing a system of waterworks throughout the municipality the sum of $500,000 is to be borrowed; $250,000 is wanted for sewers, $100,000 for parks, and $100,000 for roads. By-laws for these will be submitted to the ratepayers shortly.

Quebec, Que.

Tenders are being called until July 13th for street paving. W. D. Baillarge, city engineer.

Raymond, Alta.

The waterworks by-law was [illegible] by the ratepayers.

Strathcona, Alta.

A by-law to provide for the raising of $48,000 for the extension of the pipes of the waterworks and sewerage system, will be submitted to the ratepayers on the 30th inst.; also on the same date a by-law for the purchase and installation of certain meters and other appliances.

Souris, Man.

A by-law to authorize the issue of $9,000 of debentures to instal a system of waterworks was carried by four votes. The waterworks system which it is proposed to instal is that of the J. L. White Company, of Sioux Falls, S. D.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until July 26th for construction of about 1,340 lineal feet of reinforced concrete pipe sewer, 5-ft. internal diameter.

Victoria, B. C.

The City Council has decided to purchase fifteen one-inch and five hundred five-eighths-inch Trident meters at a cost of $2,390 for the water works department.

Vancouver, B. C.

Evans, Coleman and Evans offered a lot of eight-inch lap-welded pipe at $59.85 per 100 feet. The offer was accepted, the pipe to be taken as needed.

Five tenders were submitted for concrete work on Little Mountain Reservoir. The following are the tenders and the figures as given on the specifications, the concrete work being estimated on the square yard basis:

Contractor	Reinforced Concrete Lining	Bottom Lining	Installing Inlet and Overflow	Rock Surface
Wells Construction Company	1.18	1.42	1.20	—
Waugh, Millburn	2.50	2.05	20	200
J. C. Kennedy	1.90	1.80	50	200
M. P. Cotton and Company	2.85	1.85	1.00	600
G. H. Webster	2.10	1.55	1.00	475

The estimated amount of concrete for the bottom lining is 10,000 square yards, while the estimated surface to be rocked will require 600 square yards, and the reinforced lining for the basin 9,000 square yards.

Winnipeg, Man .

The following works are to be advertised for tenders by the city: A 24-foot asphalt pavement on Salter street, from College avenue to Mountain avenue, estimated cost, $2,729. A 24-foot asphalt macadam pavement on Manitoba avenue, from Salter to [illegible] street. Estimated cost, [illegible].

The city has [illegible] asphalt mixer, [illegible] which the new pavement for city streets is to be compounded. There is much [illegible] as it is confidently hoped that bituminous macadam will overcome the difficulties found at present in other forms of pavement used. The cost of the machine will be about $8,000.

The following is a statement of works passed by the civic council to June 25, but not ordered by the Board of Control for construction, and works ordered to be advertised for tenders: Asphalt pavements, $1,297,159.00; macadam pavements, $22,119.00; block pavements, $20,851.00; granolithic walks, $68,726.00; plank walks, $27,614.00; sewers, $129,610.00; water mains, $143,857.00; grading, $26,230.00. Total, $1,736,166.00.

Tenders addressed to chairman Board of Control will be received until July 21st for supply of 2,000 half-inch water meters. Specifications, etc., at office of city engineer, corner James avenue and King street. M. Peterson, secretary.

Tenders addressed to P. E. Ryan, secretary Commissioners of the Transcontinental Railway, Ottawa, will be received until July 26th for the excavation, construction, etc., of a main sewer line for the Winnipeg Transcontinental Railway shops, extending from the pump house and terminal yard to the Seine River. Plans, etc., at office of Mr. Gordon Grant, chief engineer, Ottawa, and at office of S. R. Poulin, district engineer, St. Boniface, Man.

AWARDED.

Brandon, Man.

Thos. Chamber, builder, has the contract for the erection of new filter building at pumping station. Estimated cost, $4,000.

Collingwood, Ont.

K. S. Macdonell, town engineer, writes that the contract for sewers was awarded to Wm. Simpson, as follows: Second stret, 15-inch sewer, $1,150.00; Fifth street, 8-inch sewer, $450.00. The contract for the brick paving was not let, and all tenders were returned unopened.

Exeter, Ont.

The contract for erection of 40,000-gallon steel tank (100-ft. elevation) was awarded to Goold, Shapley and Muir, of Brantford, at $3,300, the erection not to include foundation. F. W. Farncomb, manager, London, Ontario.

Lindsay, Ont.

The contract for paving of William street was awarded to Asphalt Block Paving Company, Windsor, at $2.40 per yard. The following bids were considered: Westrumite [illegible] and concrete foundation, complete, per square yard, 70 cents; bituminous surface, 3 inches thick, laid according to attached specification, and known as Westrumite [illegible] years, per square yard, $1.30; 9 inch [illegible] 6 feet or under in depth, per foot, 80 cents. John Maguire Contract Six inch sewer pipe, laid complete, cement joints, [illegible]

[illegible] concrete curb, [illegible] curved, per foot, [illegible] and gutter, curb 6 [illegible] curved, per [illegible] headers, per foot, [illegible] cents; [illegible] per square foot, 14 [illegible] 2½ feet x 2½ [illegible] catch-basins, greater or less depth than five feet, per foot of depth, $6; excavation and concrete foundation, complete, per square yard, 86 [illegible] 2½ inches thick, laid according to specifications, and known as asphalt block pavement, including maintenance for five years ,per square yard, $1.90. Asphalt Block Company.Nine-inch sewer pipe, laid complete, cement joints, 6 feet or under in depth, per foot, 85 cents; 6-inch sewer pipe, laid complete, cement joints, 75 cents; concrete curb and gutter, curb 6 inches, gutter 12 inches, straight, per foot, 52 cents, curved, per foot, 55 cents; headers, per foot, 60 cents; [illegible] 2½ feet x 2½ feet x 5 feet, each $25; catch-basins, greater or less depth than 5 feet, per foot of depth, $5.50; excavations and concrete foundation, complete, per square yard, 63 cents. Bituminaus surface, 2½-inch thick, laid according to specifications, and known as asphalt block pavement, including maintenance for five years, per square yard, [illegible]

New Liskeard, Ont.

Messrs. Hill and Clark, contractors, have been awarded the contract for sewerage out fall works.

Ottawa, Ont.

We are informed that the following tenders for laying pavement on Mutchmor street, between Bank and Elgin streets, were received: Ottawa Construction Company, Ottawa, $10,950 (accepted); Barber Asphalt Company, Ottawa, $12,348; Union Construction Company, Ottawa, $12,553; City Engineer, Ottawa, $13,946.

St. John, N. B.

It was recommended to the council that the contract for supply of 314 tons of c. i. pipe for water and sewerage department, be awarded to the Stavely Coal and Iron Company, of Chesterfield, Derbyshire, England, the lowest. They quoted: 12-inch pipe, $27.15; 10-inch, $27.30; 8-inch, $28.10; 6-inch, $28.60. Ten other firms tendered.

Toronto, Ont.

Contracts, etc., for the contsruction of the bitulithic pavements were awarded as follows, viz.: Follis avenue, Manning avenue to Clinton street, to the Warren Bitulithic Paving Company, $1,545; Galley avenue, Sorauren avenue to Macdonnell avenue, the City Engineer.

The contract for the construction of the vitrified block pavement, Jones avenue, G. T. R. tracks to Danforth avenue, was awarded to Page and Britnell, $19,913, the lowest.

Contracts, etc., for the construction of the asphalt pavements were awarded as folows: Bellwoods avenue, Queen street to Arthur street, the City Engineer; Badgerow avenue, Pape avenue to east end, Barber Asphalt Paving Company, price $2,277, the lowest; Barrett avenue, Chelsea avenue to 159 feet south, Barber Asphalt Paving Company, $707, the lowest; Campbell avenue, south side, Antler avenue to Royce avenue, the City Engineer; Morrow avenue, Dundas street to north end, to the Barber Asphalt Paving Company, $1,590, the lowest; Symington avenue, Bloor street to 552 feet south, to the Barber Asphalt Paving Company, $1,407, the lowest; Walace avenue, Perth avenue to railway tracks, the City Engineer.

Contracts, etc., for the construction of the sewers and the supply of 30-inch steel pipe were awarded as follows, viz.: Indian Grove, Howard Park avenue to 200 feet north, to the Orpen Company, $285, being the lowest; High Park Gardens, Keele street to 450 feet west of Indian road, to the Orpen Company, $393, being the lowest; Carlaw avenue, Danforth avenue to north city limit, the City Engineer; Whitney avenue, Danforth avenue to north city limit, to the Forcott Contracting Company, $2,365, the lowest; Chester avenue, Danforth avenue to north end, to the Forcott Contracting Company, $1,950, the lowest; John street (now Pretoria), Ellerbeck avenue to Don Mills road, to the Forcott Contracting Company, $433, the lowest; Moscow avenue, Danforth avenue to north end, to the Forcott Contracting Company, $2,037, the lowest; Danforth avenue, Broadview avenue to Sarah street, to the Forcott Contracting Company, $536, the lowest; Sarah street, Danforth avenue to north end, to the Forcott Contracting Company, $2,380, the lowest; Third street, Sarah street to west end, to Page and Britnell, $195, the lowest; 30-inch steel pipe, to the John Inglis Company, price $9.23 per lineal foot, the lowest.

The tender for treated wood block pavement on Yonge street, etc., awarded to Mr. John Maguire, has been cancelled and awarded to the Constructing and Paving Company, the next lowest tenderer, at $11,341. They will use long leaf yellow pine treated with 16 lbs. preservative per cubic foot of wood.

Vancouver, B. C.

The contract for lining the Little Mountain reservoir with cement has been awarded to the Wells Construction Company, at its tendered prices, the engineer reporting that the aggregate tender was about $31,620. It was stated that it had been decided to eliminate the rock surface finish. On this basis the aggregate of the other bidders was as follows: G. H. Webster, $34,875; J. C. Kennedy, $35,300; Waugh-Millburn Construction Company, $43,250; M. P. Cotton, $44,750.

J. C. and A. J. McDonald, of New Westminster, were awarded the contract on the lowest tender for the supplying of 3,800 feet of 25-inch steel water pipe at $3.21 per lineal foot, to be delivered within ten days after signing of the contract. Other tenders were: Evans, Coleman and Evans, 22-inch steel pipe, $2.63 per lineal foot, ten weeks' delivery; P. D. Harris and Company, 22-inch water pipe at $2.84 per lineal foot, four to five months' delivery.

Winnipeg, Man.

The contract for construction of sewer connections and installation of plumbing has been let to S. H. Geddes and Company, this city, at $390.

The tenders of the engineer of construction, being the only ones received for the following works, they were awarded to him: Sewer, on Andrews street, from Alfred to Burrows, $426; asphalt pavement, on Osborne Place, from Colony street to Balmoral place, $2,470; cedar block pavement on William avenue, from East street to a point 100 feet east, at $1,152.

Railroads, Bridges and Wharves

Brampton, Ont.

Tenders will be received by Peter Speirs, warden, County Peel, up to 18th inst., for construction of a bridge near Brampton. C. R. Wheelock, engineer. For further particulars see "Tenders and For Sale Department" of this issue.

Brockville, Ont.

Tenders addressed to E. R. Blackwell, C.E., road engineer, will be received until July 25th, for erection of 75-foot steel warren truss highway bridge, two concrete abutments, pile driving.

Dartmouth, N. S.

A plebiscite will be taken at an early date regarding the granting of $50,000 towards the Halifax and Eastern Railway Company, on the condition that the terminals will be located here.

Edmonton, Alta.

Tenders are called for the Canadian Pacific Railway for the high level bridge between Strathcona and Edmonton. Estimated cost, $2,500,000.

The tenders for the west end bridge were as follows: The Algoma Steel Company, f.o.b., Edmonton, $22,800, for erecting, including four-inch plank on sidewalk, and painting, but not including cement pedestals or abutments, $8,020. The company promise shipment of steel in three or four months. The Dickson Bridge Works Company submitted alternative plans, the prices being with 40-foot roadway and 5-foot sidewalks, f.o.b., Edmonton, erected complete, $29,960, concrete floor $7,428 extra. The other tender by this company was for 20-foot roadway and two 6-foot sidewalks, $27,000, erected complete, $32,000. Walker and Barnes' tender in behalf of the Canadian Bridge Company, was: Steel delivered at site, $24,588, erected ready for planking and paving, $30,000. The contractors submitted a plan, according to which the work would be carried out, and promised delivery in four months. Gorman, Clancey and Grindley tendered for the Dominion Bridge Company, f.o.b. site, $24,650; erected, $29,240; if temporary legs are supplied, $2,606, and $3.116 must be added to the above prices.

Kingston, Ont.

A deputation, composed of W. F. Nickle, K.C., and others, waited upon the provincial government to ask aid for the construction of a bridge over Cross Lake river, in Frontenac County. W. J. Paul, M.P.P., of Addington, presented plans. Estimated cost, $73,000.

Montreal, Que.

Tenders addressed to J. Davidson, reeve Township of Hamilton, will be received until July 16th for erection of two cement bridges, etc. Plans, etc., at home of the above mentioned.

Milton, Ont.

We are informed that on the 6th inst. the County Council of Halton decided against the erection this year of the steel or reinforced concrete bridge on the Middle Road, between Oakville and Trafalgar.

Matana, Que.

Tenders are being called until July 26th, by the Public Works Department, for construction of breakwater here.

North Vancouver, B. C.

The city clerk was instructed to prepare two by-laws for authorization to borrow $100,000 to purchase shares in the Second Narrows bridge.

The Imperial Car, Shipbuilding and Drydock Company have secured the subsidy for docks. It is stated that Swan and Hunter, of Newcastle, will build them at Roche Point.

Ottawa, Ont.

Tenders addressed to L. K. Jones, secretary, will be received until July 25th for superstructure of Le Pas bridge over the Saskatchewan River. For further information see advertisement in this issue.

Tenders addressed to P. E. Ryan, secretary the Commissioners of the Transcontinental Railway, will be received until July 26 for (1) Air, steam, water and oil piping system; (2) Yard water system; (3) Pipe tunnels and wiring ducts; required in connection with the Transcontinental Railway shops east of Winnipeg. Plans and specifications may be seen at the office of Mr. Gordon Grant, chief engineer of the commissioners, at Ottawa, Ont., and in the office of Mr. S. R. Poulin, district engineer, St. Boniface, Man.

Port Arthur, Ont.

Tenders addressed to J. McTeigue, city clerk, will be received until July 18th for the construction of reinforced concrete bridge over Current River, etc. Further information from corporation engineer.

Prince Rupert, B. C.

The Grand Trunk Pacific has been granted subsidy for construction of floating drydock, and the Marine Department has been authorized to construct a marine depot to cost $100,000. It is stated work will start at once. Estimated expenditure of railway on drydock, $1,500,000.

Prince Albert, Sask.

It is stated the Dominion Department of Public Works has issued instructions to Z. Malhoit, government engineer, to prepare plans and specifications for the construction of wharf, for which an estimate went through at the last session of parliament.

Strathcona, Alta.

A by-law to provide for the raising of $38,000 for construction of bridge over Mill Creek ravine will be submitted to the ratepayers on the 20th inst.

Sault Ste. Marie, Ont.

Tenders addressed to R. S. McCormick, chief engineer, will be received until July 23rd for subgrading a section of the Manitoulin and North Shore Railway, a distance approximately of 18 miles. Plans, etc., at office of the above.

AWARDED.

Elder's Bridge, Ont.

We are informed that John A. Watson has been awarded the contract for the sub-structure of the bridge here; Hamilton Bridge Works the contract for superstructure. Barber, Young, Toronto, engineers.

Ottawa, Ont.

We are informed that The Canada Foundry Company, Toronto, has been awarded the contract for the superstructure of the bridge over the Saskatchewan River, for the Canadian Northern Railway.

St. Lazare, Man.

We are informed that the Algoma Steel Bridge Company's tender for bridge over Assiniboine River was acepted at $4,885, the only tender.

Toronto, Ont.

G. C. Lewis is the contractor for the Wadsworth arch bridge crossing the Humber. The specification call for length 178 feet, breadth 20 feet with road 16 feet wide.

Vancouver, B. C.

A contract for the construction of the first section of the Kettle River Valley Railway was awarded to the engineering and contracting firm of Macdonell, Gzowski and Company, this city. The work awarded covers that portion of the line lying between Merritt, a station on the Spences Bridge-Nicola Railway, and the headwaters of the Coldwater River, a distance of thirty miles.

Winnipeg, Man.

We are informed the Board of Control have let the contract for the Brown and Brant street bridge over the Canadian Pacific Railway tracks for a total of $259,800. The Cleveland Bridge Engineering Company, of Darlington, England, get the contract for the superstructure at $205,160. The contract for the piers was let to William Newman and Company, at $54,720. Bridge to be ready by June 1st, 1911.

The Canadian Northern Railway awarded to Foley, Welch and Stewart, railway contractors of St. Paul, the contract for the construction of the Canadian Northern Railway line from Virginia to Duluth, in Minesota.

Public Buildings, Churches, Schools, etc.

Armow, Ont.

Tenders addressed to R. B. Campbell, clerk, Kincardine Township, will be received until July 16th for veneering township hall with brick.

Belleville, Ont.

A campaign has been started to raise $40,000 for a new Y. M. C. A. building. C. K. Colhoun, of Montreal, international secretary, is in charge.

The City Council granted the request of the Board of Education for grant of $30,000 for the erection of new school. Work will start at once.

Tenders are being called by Public Works Department, Toronto, until July 19th for alterations and additions to the barn at the Institution for the Deaf and Dumb.

Berlin, Ont.

A health association was organized here for the erection, etc., of a modern tuberculosis sanitarium for Waterloo County. Winston Brewster, of Hespeler, is secretary pro tem.

Brandon, Man.

The by-laws to erect new central fire hall at a cost of $27,000 and reconstruct city hall at an expenditure of $20,000 were carried.

Chilliwack, B. C.

The ratepayers have sanctioned an expenditure of $15,000 on a new city hall.

Elkhorn, Man.

Tenders addressed to C. R. Duxbury, secretary-treasurer school board, will be received until July 18th for all work in connection with the erection of a 6-roomed school building. Plans, etc., at office of W. A. Elliott, architect, Brandon.

Eganville, Ont.

Tenders addressed to J. R. Campbell, secretary public school board, will be received until July 22nd for the various trades required in erection of public school.

Fredericton, N. B.

Tenders were called until July 13th for the erection of additions and improvements to the Masonic Temple here. W. E. Minue, architect, 220 Aberdeen street.

Fort William, Ont.

Tenders were called until July 7th for a suitable site for the erection of court house and jail. A. McNaughton, city clerk.

Granby, Que.

Tenders addressed to Dr. L. A. Lessard, chairman school board, will be received until July 15th, for installation of heating and ventilating system at the convent and college here.

Gretna, Man.

Tenders addressed to Harry F. Stirk, secretary-treasurer school board, will be received until July 15th for erection of 4-roomed brick school. Plans, etc., at office of Building Exchange, Winnipeg, or at office of the above mentioned.

Halifax, N. S.

The site selected for the market building is the block bounded by Duke, Brunswick, Buckingham and Albemarle streets. Assessed value, $17,400.

Hamilton, Ont.

Permit was issued to Stewart and Witton for brcik police station, Sherman avenue, to cost $12,000.

London, Ont.

City Architect Nutter has been instructed to prepare detailed plans for Colborne street school. Debentures to raise $30,000 to defray cost will probably be issued shortly.

Lloydminster, Alta.

The site for the new government building has been selected. Church and Main streets.

North Vancouver, B. C.

Aldermen Irwin, Smith, McCrae, and Shultz were appointed as a committee to report on a suitable site for city hall.

North Toronto, Ont.

Debentures to the amount of $17,000 for the purpose of erecting a new public school on Remleigh avenue, will be purchased.

Quebec, Que.

Mr. Emile Tanquay has been appointed architect for the new fire and police station, for which a site has been purchased.

Ottawa, Ont.

For further information regarding the erection of theatres, noted in issue of June 29th, address Mr. Clark Brown, general manager, Bennett Circuit, United Booking Office, New York City.

No contract for the erection of the Oneida Indian school has been awarded, all the tenders being too high.

Prince Albert, Sask.

A building to combine theatre and hotel will be built at once at an estimated cost of $35,000. Ald. Matheson and Chas. O'Connor are interested.

Port Hood, N .S.

Tenders addressed to J. H. Murphy, secretary school board, will be received until July 19th for erection of academy building. Plans, etc., at office of town clerk. D. Henderson, architect, Truro.

Rosemount, Que.

The Catholic Board of School Commissioners will erect two new schools, one of which will be erected at once near Masson street, and will cost about $100,000.

Renfrew, Ont.

The Board of Education adopted the plans for the Central Public School prepared by Architect Garvock, Ottawa, and decided to call for tenders.

The Separate School Board are considering a new school building.

St. Catharines, Ont.

Fire Chief Batty, in his report, recommends two new sub-fire stations at once.

Sandwich, Ont.

A by-law will be voted on on July 18th to raise $20,000 for the purpose of erecting offices to be used in connection with the court house, etc.

Strathcona, Alta.

Plans for the new armory have been prepared. J. M. Douglas, M.P.P.

Toronto, Ont.

The Ontario Government has a permit for the proposed three-storey addition to Osgoode Hall, to cost $95,000.

The Art Museum directors, it is stated, will erect a new art building in the Grange property, and about $100,000 will be spent by the city in beautifying the grounds.

The city has a permit for 1-storey brick and steel poultry building at Exhibition Park, $36,000.

The Northern Congregational Church, Carlton street, are looking for a new building site.

Vernon, B.C.

The contractor for the government building here is W. A. Cryderman. Estimated cost, $50,000.

Wolseley, Sask.

The by-law to raise $9,000 for the purpose of buliding a four-room addition to the present school was carried.

Wainwright, Alta.

Tenders for purchase of $18,000 school debentures, 5 per cent., 20-year, will be received until August 15th. H. V. Fieldhouse, secretary-treasurer.

Tenders addressed to H. V. Fieldhouse, secretary-treasurer S. D., will be received until July 15th for supply and installation of heating plant in the school building. Plans with the above mentioned.

Winnipeg, Man.

The congregation of Christ church are looking for a new site. J. H. Carleton, people's warden. It is stated that a Montreal firm has bought the former site, and that a large business building will be erected.

AWARDED.

Guelph, Ont.

The contracts for Central School were let to Messrs. Stevenson & Malcolm at $1,900 for the steam heating system; and to Messrs. McCormack & Robinson at $2,470, for the ventilating system. Other work, such as cement foundation and cutting will be let by contract and day labor.

New Liskeard, Ont.

The contract for the fire hall here has been awarded to Hill & Clark.

Ottawa, Ont.

St. Paul's Presbyterian church is to be entirely redecorated, and new windows installed. J. A. Ewart is the architect and the contract has been awarded to Thornton, Smith and Company, of Toronto, at about $4,000.

Thomas Brethour got the contract for the plastering of Breeze Hill avenue school, for $1,590, and Charles Hunt the one for Hopewell avenue, for $1,555.

Stewart, B. C.

A contract for construction of the lockup, court room, at Stewart was awarded to James Cumming, of Stewart, $4,000.

Renfrew, Ont.

The contract for the erection of new public school has been awarded to M. J. O'Brien's Renfrew Planing Mill for $32,000, and it is expected that it will take about $4,000 more for equipment.

Toronto, Ont.

The contract for erection of band stand in Exhibition grounds was awarded to Orr Brothers, the lowest tenderer, at $4,535. Others tendered as follows: $4,697, $4,690, $7,787 (informal, no deposit), $4,600.

Purdy, Mansell were awarded the contract for heating and plumbing in Osgoode Hall.

The contracts were awarded by the Separate School Board for alterations at 471 Jarvis street, as follows: Madden Brothers, carpenter work, $200; Madden Brothers, plastering, $115; J. W. Mogan, painting and kalsomining, $140; D. Glynn & Son, plumbing, $152; F. R. Bagley, skylights, $78. A new six-foot fence will be erected at St. Francis' school. The contract for heating and ventilation of the new addition to St. Ann's school was awarded to J. E. Gray for the sum of $1,888. Assistant secretary, J. G. Hall.

Vancouver, B.C.

The Public Works Engineering Company were awarded the contract for concrete work in connection with the new incinerator. The company tendered at $5,675, but were given the work by day contract, plus 10 per cent. It was suggested that the chimney for the incinerator be built of perforated radial brick with concrete lining inside.

Woodstock, Ont.

The contract for the plumbing in the Beale street school was let for $658, and that for Delatre street, at $649.

Winnipeg, Man.

It is stated that the Vulcan Iron Works has secured contracts for all the iron and steel work in both technical schools for $50,000.

Business Buildings and Industrial Plants

Arnprior, Ont.

About 60,000,000 feet of lumber, valued at $1,000,000, belonging to Gillies Lumber Company, were destroyed by fire on the 4th inst.

Berlin, Ont.

The furniture factory of Baetz Brothers & Company was destroyed by fire on the 6th inst. Estimated loss, $30,000.

Claresholm, Alta.

Twenty thousand dollars' damage resulted from a fire which broke out in Gibson's livery.

Calgary, Alta.

Ex-Alderman Watson, local representative of a Boston firm, is authority for the statement that Calgary will probably be the site for a large steel industry in a few months' time.

Fredericton, N. B.

The Scott Lumber Company's saw mill, operated by Bank of Nova Scotia, was destroyed by fire on the 3rd inst. Loss not stated.

Hamilton, Ont.

The firm of Stanley Mills & Company has offered the city a quarter of a million dollars for Gore Park. The company wants to erect a fifteen storey building on the site.

Kamloops, B.C.

Kamloops will grant the Canadian Northern Railway a site for station and carshop purposes.

London, Ont.

The Forest City Laundry, King street, was damaged on the 8th inst. to the extent of about $15,000.

Ottawa, Ont.

We are informed that A. Rosenthal and Sons wil make their business building 8 stories instead of seven, and that the contract price will exceed $135,000. Noted in issue of June 1.

Mr. Alex. Maclaren, proprietor of the mills at Wakefield, is quoted as having said that it is not likely that the mills will be rebuilt.

Quebec, Que.

Tenders were called on July 13th for offices here for the Levis Ferry.

Ponoka, Alta.

The Canadian Bank of Commerce will erect a branch here.

Stratford, Ont.

On July 28th the by-law to grant privileges to the Dufton Company, Limited, will be voted on.

Sydney, N. S.

A building permit has been issued to Rhodes, Curry and Company, for the erection of buildings for the Imperial Oil Company, on Kings Road. Cost $2,000.

On the 20th inst., the ratepayers will vote to approve of the council's recommedation to offer a bonus of $350,000 and free site to Constant & Hawthorne, naval architects, Montreal representatives of a British company for the establishment of a shipbuilding plant.

Saskatoon, Sask.

E. M. Mott, manager of Cockshutt Company, at Winnipeg, has purchased a frontage of 75 feet; it is surmised a warehouse will be built.

Selkirk, Man.

Negotiations are being carried on as to a site for the erection of a flour mill here by C .C. Bird Company, of Minneapolis, Minn.

St. John, N.B.

It is stated that the borings to determine the suitability of Courenay Bay as a site for a drydock show that conditions for the construction of dry dock are excellent. The promoters, Harland & Wolff, will file plans and apply for subsidy.

St. Catharines, Ont.

It is announced that the Sash and Metal Works Company will expand their business. President L. E. McKinnon, Buffalo, N. Y.

Strathcona, Alta.

We are informed that the tile factory mentioned in issue of June 29th will not be erected until next year. Estimated cost of equipment of pressed brick plant, $20,000,

Steveston, B. C.

The Burrard Canning Company's plant was destroyed by fire on the 5th inst. Loss estimated at $30,000. Messrs. J. Webster, Ross and Howard, Vancouver, are the owners.

Toronto, Ont.

Mr. J. Ross Robertson, proprietor of "The Evening Telegram," has requested permission to connect his present building with an addition which he proposes to have built across a lane.

Tenders will be received until July 14th for the reinforced concrete structure of building for the News Publishing Company. Bank and Smith, architects, 19 Wellington street west.

Permits were granted to the Bank of Toronto for a 3-storey building, corner of Dundas and Keele streets, $30,000; also to Mr. F. Mauthie for a new 4-storey hotel, corner of Gerrard and Parliament streets, $18,000.

It is stated that the Key Engineering Company, Limited, London, England, are seeking to locate a branch factory here. Leonard Andrews, representative; Dr. Orr, manager of Canadian National Exhibition, is interested.

Vancouver, B. C.

General outline for the British Columbia Electric Railway block, south-west corner of Hastings and Carrall streets, has been approved, and detailed plans are being prepared. Plans call for five storeys. Estimated expenditure, $250,000.

The Arbuthnot sash and door factory was destroyed by fire on the 29th ult. Estimated total loss, $20,000.

Dominion Bond and Trust Company has acquired the property covering the southwest corner of Granville and Cordova streets. The plans call for the erection of a fourteen-storey business block, and are now in course of preparation. Estimated value, $500,000. Operations will probably be started during the present esason.

Winnipeg, Man.

The Canadian Pacific Railway will add two storeys to the Royal Alexandria Hotel here.

The Pullan Paper Company, of Toronto, were burned out on the 7th inst. Loss estimated at $20,000.

It is stated the Manitoba Government Elevator Commission have placed orders for material for twelve elevators. The total amount of this order is over $150,000.

The North-West Hide and Fur Company's building was partially destroyed by fire on the 9th inst. Loss about $60,000.

McKenzie and Mann are having plans prepared in the east for the construction of the immense hotel which is to replace the old Manitoba, burned down in 1898. In an interview Mr. McKenzie estimated the cost of the new structure to be nearly $1,000,000. Noted previously.

G. M. Miller, architect, of Toronto, has plans of the new Winnipeg warehouse for the Ontario Wind Engine and Pump Company. The warehouse will be five storeys high, and the estimated cast is $50,000. (Tenders have not yet been called for.)

Tenders addressed to J. Woodman, architect, Free Press Building, will be received until July 16th for a brick and reinforced concrete bakery for W. R. Milton.

Tenders addressed to Jordan and Over, architects, 47 Canada Life Building, will be received until July 16th for all trades required in the erection of warehouse for the Gordon Mitchell Drug Company, Limited, Steveston, British Columbia.

AWARDED.

Edmonton, Alta.

Messrs. Pheasy and Batson have the contract for the erection of the 3-storey building for Moser and Ryder.

Fort William, Ont.

Contracts for the erection of Grand Trunk Pacific roundhouse and machine shops on the Mission have been awarded to the Carter, Halls, Aldinger Company. Estimated cost, $100,000.

Ottawa, Ont.

P. M. Edey has been chosen architect for the factory of the Continental Paper Bag Company, to be erected on Wellington. The general contract has been awarded ed Holbrook and Sutherland, and the construction will be begun at once. The factory will be built of concrete and brick. It will have two storeys and a basement. The factory will be 210 feet long by 80 feet wide. Noted in issue of June 8th.

Residences

Hamilton, Ont.

Permit was issued to Stewart and Witton, brick residence, Charlton avenue, for G. F. Jelfs, $4,000. ,

Magnetawan, Ont.

The brick residence of Mr. E. W. Jenkins, a mile from here, was destroyed by fire on the 8th inst. Loss $8,000.

Montreal, Que.

Recent building permits include: J. Wolfe, 894 Nicolet street, one house containing two dwellings, $4,000; Fred, Pare, Gain street, one house containing three dwellings, $3,000; C. J. Brown, 4257 St. Catherine street, three houses, $11,000; H. Larose, 211 Nicolet, three houses containing eight dwellings, $10,000; M. Larose, 2467 Hutchison street, two houses containing six dwellings, $7,000; J. O. Proulx, 99 St. James, two houses containing six dwellings, $6,000; J. A. A. Belanger, 1121 Mount Royal avenue, one house containing four dwellings, $12,000; Jos. Shea, 2182 St. Denis, one house containing three dwellings, $5,000; R. Forget, 271 Nicolet street, one house containing two dwellings, $3,000; F. Samuels, 5680 Sherbrooke street, two houses, $4,000; N. Des Troismaisons 118 St. James one house containing three dwellings $3,000.

Ottawa, Ont.

Among the recent building permits are: Mrs. Klock and Miss Bangs, dwellings on Frank street; Andrew McCreadie, builder, $4,000; J. Belanger, dwelling, Preston street, $3,800; T. J. Somerville, dwelling, James street, $6,000; F. E. Latimer, dwellings, Florence street, $5,000; J. H. McCullough, dwelling, Centre street, R. A. Kemp, builder, $3,300; W. D. Hopper, dwelling, Carling avenue, R. A. Kemp, builder, $4,000; James Gillespie, Center street, dwelling, $2,500.

Peterborough, Ont.

Bulk tenders or tenders for the several trades in connection with the erection of St. Paul's Presbyterian manse, addressed to J. C. Shook, chairman building committee, will be received until July 16th. W. F. Nelson, secretary.

Toronto, Ont.

A building permit has been issued for the residence in connection with Victoria College, [illegible].

Permit was issued for a three-storey apartment house on Maitland street, for Mr. George Meech, $16,000.

Mr. Frank McBain, 1000 Bloor street west, has purchased eighty feet of land east end of Castle Frank, Rosedale. Two first-class detached houses will be erected.

Victoria, B. C.

Permits have been issued as follows: To S. E. Matthews for a dwelling on Pendergast street, $2,500; to the Victoria Wather Works Department for a caretaker's dwelling at the Smith's Hill Reservoir, $2,500; S. Millington, dwelling, Linden avenue, $3,000; T. A. Johnston, dwelling, Richardson street, $4,000; L. S. V. York, dwelling, Cook street, $3,000.

Winnipeg, Man.

E. D. Moore, 92 Colony street, is one of a company now having plans drawn for an apartment block, which it is proposed to erect on Osborne place, at a cost of approximately $200,000. The plans are not completed, but information on the project could be secured from the above.

Power Plants, Electricity and Telephones

Fleming, Sask.

Tenders addressed to S. H. Greenwood, secretary, will be received until July 15th for construction and installation of telephone system and switchboard.

Grand Falls, N.B.

It is announced that arrangements have been completed between the Grand Falls Power Company and Sir Wm. Van Horne and other owners of property by which the latter will take over the old company and develop power at the falls.

Strathcona, Alta.

A by-law to provide for raising $10,000 for extension of the city's electric light and power system will be submitted to the ratepayers on the 20th inst.

St. Catharines, Ont.

By-laws, giving the Buffalo, Niagara and Toronto Railway Company, and the Ontario Power Company rights over city streets, will be voted upon July 29th.

Winipeg, Man.

Permit was issued to city for power sub-station, corner of Hilock and McPhillips streets, $11,400.

Yorkton, Sask.

The Town Council passed a resolution authorizing the preparation of a by-law to expend $35,000 on a municipal electric light plant.

AWARDED.

London, Ont.

The Water Commissioners awarded the contract to the London Foundry Company for 76 ornamental electric light poles at $29 each. The Northern Electric Company, of Toronto, were given the contract for line hardware, amounting to $1,700.

Prince Albert, Sask.

Goldie & McCulloch, of Galt, Ontario, obtained the contract for boilers for the electric light works.

Toronto, Ont.

Watson, Jack and Company, of Montreal, have recently been awarded a part contract from the Hydro-Electric Com-

(Continued from page 29)

Tenders and For Sale Department

City of Belleville

Waterworks Pumping Plant

Sealed tenders endorsed Pumping Plant will be received by the City Clerk up to 20th JULY, for the following pumping equipment:

A. Two turbine pumps, direct connected to [illegible] with lightning preventive apparatus, and starting apparatus.

B. Two triplex pumps, also direct connected to similar motors and apparatus.

Note.—Equipment to be installed by contracting company. Each pump to have a guaranteed capacity of 1,000 gallons per minute against a head of 240 feet. Three phase alternating current, 60 cycles, 2,200 volts. Supplied with water meter.

Further particulars can be obtained on application to the undersigned.

The lowest or any tender not necessarily accepted.

JAMES G. LINDSAY,
City Engineer.

Belleville, July 4th, 1910.

Department of Railways and Canals, Canada

Quebec Bridge

Tenders for Superstructure

Notice to Contractors

Sealed tenders, addressed to the undersigned and endorsed "Tender for Quebec Bridge Superstructure," will be received at this office until 12 o'clock noon, not later than SEPTEMBER 1ST, 1910, for the superstructure of a Bridge across the St. Lawrrence River near the City of Quebec.

Plans and specifications may be seen and forms of tender obtained on and after July 1st, 1910, at the office of the Quebec Bridge Board of Engineers, Canadian Express Building, Montreal, and at the Department of Railways and Canals, Ottawa.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $500,000, made payable to the order of the Minister of Railways and Canals of Canada, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted and in accordance with the terms stated in the form of contract accompanying the specifiactions.

Cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The lowest or any tender not necessarily accepted.

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 17th June, 1910,

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 28

FOR SALE

Kelly Steam Pump Horizontal Cross Compound, in good condition, capacity 2,000,000 imperial gallons, must be removed to make room for electric equipment. Inquire the Water Commissioners, London, Ontario. 31

NEW HAMBURG

Debentures for Sale

Tenders will be received by the undersigned up to 2 o'clock p.m., JULY 18TH NEXT, for the purchase of $8,000 4½ per cent. Electric Light Debentures of the Village of New Hamburg, payable in thirty equal annual instalments.

WM. MILLAR,
Clerk.

New Hamburg, June 23rd, 1910. 28

Canadian Pacific Railway

Central Division

Tenders are hereby requested for the construction of Piers, Abutments and Pedestals for Bridge over the Kaministiquia River at Fort William. Plans, specifications and forms of proposal can be seen at the office of the Engineer of Bridges, Montreal; Division Engineer, Toronto, and Division Engineer, Winnipeg. Proposals must be made out on the Company's standard proposal form, and sealed in an envelope, plainly marked "Proposal for Kaministiquia River Bridge, Fort William." These must be delivered at the office of the Division Engineer, Winnipeg, by 12 o'clock JULY 15TH. The right is reserved to reject any or all proposals.

(Signed) FRANK LEE,
Division Engineer.

28

City of Moose Jaw

Saskatchewan

Main Drainage Works

Sealed tenders endorsed "Tender A," "Tender B," etc., will be received by the undersigned City Clerk until 8 o'clock, p.m., on MONDAY, JULY 18TH, 1910, for the following:

Contract "A." Supplying material for and constructing Sewage Disposal Plant complete, and laying Trunk Sewer.

Contract "B." (1) Supplying and installing a complete Air Lift System; (2) Supplying and installing one electrically-driven Centrifugal Pump and Auto Starter.

Contract "C." Supplying and delivering 3,000 cords of Field Stone.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw, and also at the office of the "Canadian Engineer" at the following addresses:

Toronto, 62 Church Street.
Montreal, B33 Board of Trade Building,
Winnipeg, Room 404 Builders' Exchange Buildings.

The lowest or any tender not necessarily accepted.

J. M. WILSON,
City Engineer.

W. F. HEAL,
City Clerk.

Moose Jaw, Sask., July 16th, 1910. 28

Tenders

Sealed tenders endorsed "Tender for Etobicoke Bridge," addressed to Peter Speirs, warden, County Peel, Mayfield P. O., Ont., will be received up to 9 o'clock p.m. on MONDAY THE 18th OF JULY, 1910, for the supplying of material, construction and erection of a 50-foot span steel highway bridge, near the town of Brampton. For specifications and form of tender write to the undersigned.

C. R. WHEELOCK,
County engineer,
Orangeville, Ont.

Orangeville, July 5th, 1910. 28

Tenders Wanted

Tenders will be received by the secretary-treasurer of the town of Coaticook up to and including the 23rd OF JULY, INST., for the construction of a reinforced concrete arch bridge over the Coaticook River, in the town of Coaticook, Bridge to be 100 feet span. Plans and specifications may be seen at the secretary's office or at the office of the undersigned, and returnable plans and specifications will be mailed upon request. An accepted cheque equal to 5 per cent. of the contract price to be mailed with each tender, and the lowest or any tender not necessarily accepted.

FRED. C. DAVIS,
Consulting engineer,
Sherbrooke, Que.

P. O. box 206.

28

City of London

Tenders will be received by the Water Commissioners of the city of London up to noon of the 29th DAY OF JULY next for the following:

Section "A"—Two 3,000,000 gallon turbine pumps, 250 ft, head, 750 R. P. M.

Section "B"—Two 250 H.P. 750 R. P. M. self starting synchronous motors with direct connected exciters.

Section "C"—Two 350 K. V.A. 3-phase, 13,200 to 2,300 volt self cooled transformers.

Section "D"—Switchboard equipment for "B" and "C."

Section "E"—Ewitchboard equipment for incoming line and outgoing power and lighting line, with lightning arresters, etc.

Section "F"—One 25 K. W. single phase self cooled 2,300 to 110 volt lighting transformer.

Frequency of all current 25 cycles.

Form of tender, instruction to bidders, plans and specifications may be procured from the undersigned or from Mr. H, J. Glaubitz, consulting engineer, Continental Life Building, Toronto, Ontario, or

O. ELLWOOD, secre,tary,
Board of Water Commissioners.

28

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—A large quantity of galvanized steel, suitable for re-inforcement. Would cut to sizes to suit purchasers. Enquiries solicited. GOOLD, SHAPLEY & MUIR COMPANY, Limited, Brantford, Ontario. 28

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 inch x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

Tenders Wanted

Sealed tenders will be received by the undersigned up to 1 o'clock p.m. on WEDNESDAY, JULY 27th, 1910, for the construction of a drain in the Township of Minto, known as Municipal Drain No. 3.

The work consists of the excavation of a new drain in places and the deepening and widening of a drain or ditch already constructed, and deepening and straightening of a creek or watercourse, in all 35,000 feet in length. The work is divided into three sections and tenders will be received for one or all the sections.

Plans and specifications may be seen at the office of the undersigned, and forms of tender may be had on application.

W. D. McLELLAN,
Clerk of Minto,
Harriston, P. O.

29

Department of Railways and Canals, Canada

Hudson Bay Railway

Saskatchewan Bridge

Notice to Contractors

Sealed tenders, addressed to the undersigned, and endorsed "Tender for substructure of Le Pas Bridge," will be received until 16 o'clock on MONDAY, JULY 25, 1910

Plans, specifications and form of contract to be entered into, can be seen on and after this date, at office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer, Hudson Bay Railway, at Winnipeg, Man., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000.00 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals.
Ottawa, July 2, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 29

Power Plants, Electricity and Telephones

(Continued from page 27.)

Commission of Ontario for both the suspension type and strain type high tension insulator.

Contracts for the various trades in connection with the erection of a sub-station on Macpherson avenue for the Toronto Hydro Electric system have been awarded as follows: Masonry, Brown and Love, $25,005 (if Roman stone is used instead of Ohio stone, deduct $1,800); roofing, R. Gilday, $160; plumbing, Fred Armstronfi $415; painting, Jas Casey, $85.

Victoria, B.C.

It is announced that the Dominion Government intends to rebuild the entire telephone line from Kamloops to Lower Nicola. Contracts have been awarded to Thompson & McClughan for poles from Kamloops to Quilchena; J. Nash, from Quilchena to Nicola to Lower Nicola.

Winnipeg, Man.

The tender of the Winnipeg Foundry Company, at $1,630 for the supply of castings for conduit manholes for the civic electrical conduit system has been accepted.

Miscellaneous

Toronto, Ont.

Recent building permits include: Parisian Laundry, 3-storey brick addition, corner King and Portland, $15,000; City of Toronto, 1-storey brick and steel poultry building, at Exhibition Park, $36,000; J. S. Case, 4 detached 2½-storey brick dwellings, Indian road, $16,000; B. C. Finch, 1 pair semi-detached 2-storey and attic brick dwellings, Glendale, $4,600; F. L. Beecroft, 3 attached 2-storey brick dwellings, 21-23-23½ Cowan avenue, $5,500; H. J. Rea, 2½-storey brick dwelling, Binscarth road, $5,500; Dr. J. H. Black, 2½-storey brick dwelling and infirmary, Queen street east, $6,000; P. Dallamatta, 2-storey brick theatorium and dwelling, on Queen and Booth, $8,000; Robt. Luxton, 3 detached 2-storey rough-cast dwellings, brick fronts, 28, 29, and 30 Globe avenue, $4,800; R. E. McDonagh, 1 pair semi-detached 2½-storey brick dwellings, Major and Sussex, $4,500; A. Ionson, 1 pair semi-detached 2½-storey brick dwellings, corner Queen and Boston, $5,500; E. Bracewell, 2-storey brick dwelling, on Perth, $4,600; Massey-Harris Company, 3-storey brick printing department, King and Strachan, $8,000; T. McIlwain, 2-storey brick dwelling, on Indian road and Howard Park avenue, $5,000; J. J. Downey, 2 detached 2-storey and attic brick dwellings, College street, $7,000; Pure Gold Manufacturing Company, 2-storey brick warehouse and factory, on College, $20,000; Laughton Brothers, 1 pair semi-detached 2-storey brick dwellings, 151-3 Gilmour avenue, $4,400; Geo. Meach, 3-storey brick apartments, Maitland street, $16,000; J. Pierce, 4 attached brick dwellings, Brock avenue, $7,200; Mr. Bingham, 2-storey and attic brick dwelling, Indian road and Constance street, $5,000; Jas. Gibson, 9 pair semi-detached 2-storey brick dwellings, Royce and Campbell, $32,000; John New, 1 pair semi-detached 3-storey brick stores and dwellings, Bloor west, $8,000; A. E. Brobyn, 3 pair semi-detached 2-storey brick dwellings, Campbell avenue, $12,000; Mrs. E. L. Green, 1 pair semi-detached 2-storey brick dwellings, 122-4 Bloor street west, $10,000; Douglas G. Ross, 2-storey and attic dwelling, Walmer road, $10,000; Chas. Wetz, 2 pair semi-detached 2-storey and attic brick dwellings, Kendal avenue, $9,600; H. Sparrow, 1 pair semi-detached 2½-storey brick dwellings, Grandview and Hampton, $5,000; Jos. Lavoie, 3 attached 2-storey brick dwellings, Garden, $6,000; R. Buckell, 2 pair semi-detached 2½-storey brick dwellings, Montrose and Sulley crescent, $10,000; Caplan Brothers and Laafskey, 1 pair semi-detached 2½-storey brick dwellings, Grange avenue, $6,000; W. S. Grimshaw, 6 attached 3-storey brick stores and dwellings, Shaw and College, $24,000; Mrs. C. Vair, 2½-storey brick dwelling, on Allan avenue, $5,000; C. McEachren, 2-storey and attic brick dwelling, Garden and Keele, $5,500.

Walkerville, Ont.

The Detroit Dredging Company secured the contract for dredging the Little River drain—58,500 cubic yards for $5,640. Owen McKay is the engineer.

Winnipeg, Man.

The following building permits have been issued during the past week: Eastern Townships Bank, east side of Main, between Portage and Lombard, $84,000. Winnipeg School Board, technical school, west side of Salter, between Church and Machray, $330,000. Rumford and Brock, laundry building, north-east corner of Wellington and Horne, one storey, 40 by 100 feet and will cost $19,000. C. N. R., engine house in yards, $40,000. G. J. Gudmunson, house, west side of Simcoe, $3,000. D. J. Ross, double dwelling, north side of QuAppelle, $9,000. F. … Metcalf, house, north side of Jubilee, $2,500. A. T. Davidson, house, north side of Beresford, $2,500. G. W. Ford, three houses, west side of Home, $12,000. L. H. Shepley, house, east side of Nassau, $3,000. Aslip Brick, Tile and Lumber Company, stable, south side of Nairn road, $3,000. Johnson and Anderson, house, west side of Home, north side of Rathgar. J. D. Watson, house, east side of Clifton, $5,000; T. Weber, house, north side Jessie, $5,000. Thomas Ryan, terrace and stores, north side of Logan, $9,000. M. Simon, two dwellings, north side Bannerman, $4,000. Dominion Bridge Company, storehouse, south side Dublin, $8,000. Baudeen and Fraser, dwelling, east side of Home street, $3,500. D. McOuatt, dwelling, south side Welseley, $5,000. Mrs. H. E. Sharpe, dwelling, north side Gertrude, $4,500. G. G. Teeton, dwelling, north-east corner Maplewoo dand Hay, $5,000. W. W. Fleming, dwelling, east side Chestnut, $4.00[illegible].

AWARDED.

Winnipeg, Man.

The tender of T. D. Robinson and Sons for the supply of 1,000,000 feet, B.M. lumber, at $25,143.75, was accepted by the city at the last meeting of the council.

New Companies

The Schomberg Telephone Company, Limited, Schomberg, Ont., capital $15,000. Incorporators, F. Amey, A. Mawer and W. F. Chantler, all of Schomberg.

Kiamiaka Valley Lumber Company, Routhier Station, Quebec, incorporated, capital $20,000. Incorporators: J. Dumas, Lac-aux-Ecorces, Quebec; O. Lalonde, Val Barette.

Bitulithic Paving Company, Limited, Montreal, Que., incorporated, capital $150,000. Incorporators, W. Gordan MacKendrick, W. J. Evans, contractor, J. M. Godfrey, barrister, both of Montreal, and W. A. Henderson, barrister, Toronto.

The Canadian Hassam Paving Company, Limited, Montreal, Quebec, incorporated, capital $40,000. Incorporators: W. D. Hassam, engineer, and A. Thomas, manufacturer, both of Worcester, Massachusetts; L. DeGuise, bank manager; T. Leclaire, contractor; and O. Asselin, journalist, all of Montreal.

National Fire-Proofing Company, Toronto, capital, $1,000,000.

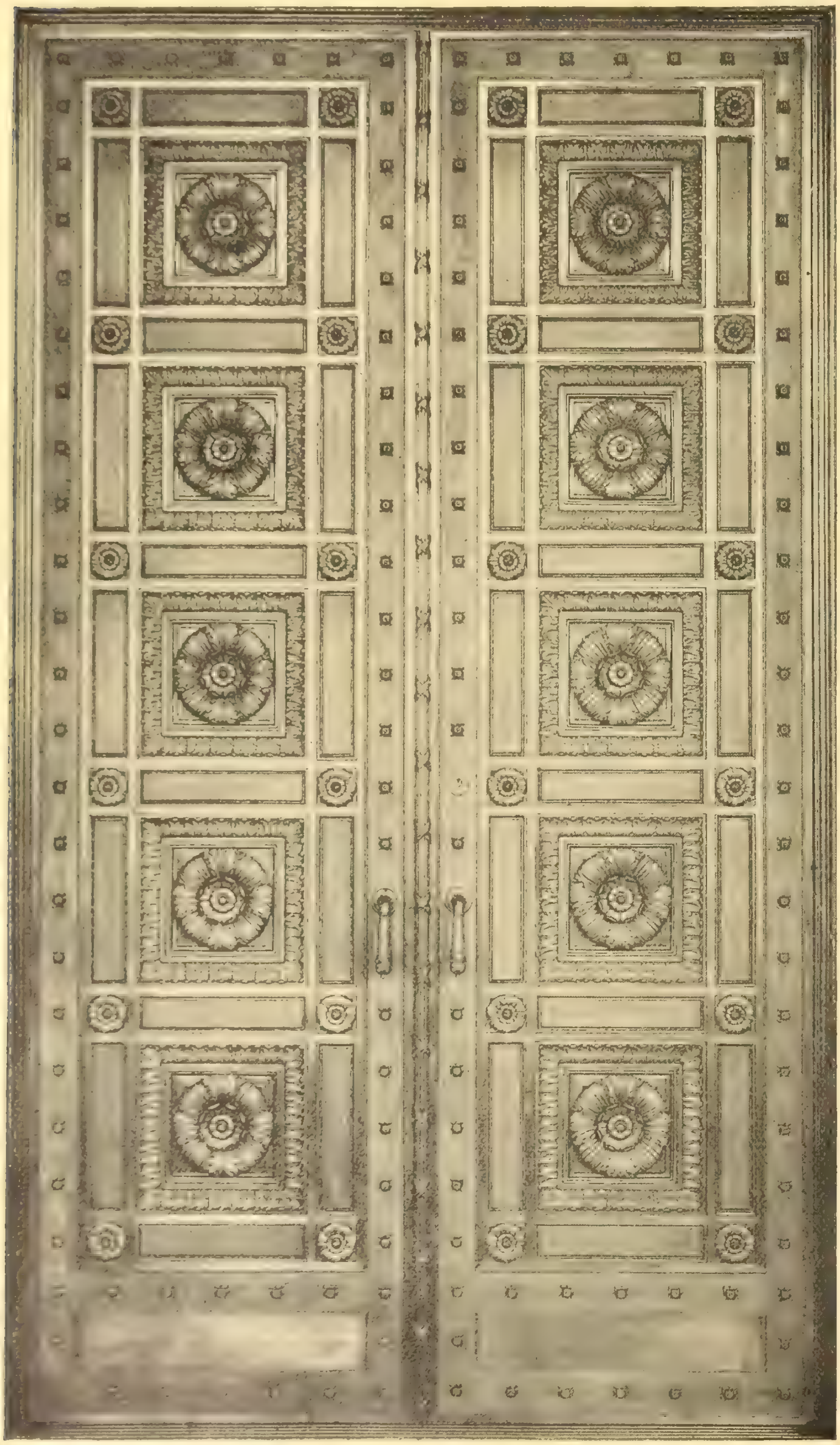
The United Electric Company, Limited, Winnipeg, Man., Arthur E. Johnson, barrister-at-law, and William Pope, electrician, Winnipeg, Man.

Taggart Iron Works, Limited, Man., capital $40,000. Incorporated to carry on the business of manufacturers of and dealers in all kinds of machinery, electrical apparatus, railway cars, etc. Incorporators, Arthur R. Taggart, manufacturer, and Albert H. Luce, accountant, both of Winnipeg, Man.

Bronze Doors for Royal Bank, Winnipeg

The ornamental iron department of the Canada Foundry Company has just completed a pair of very fine bronze doors for the Royal Bank at Winnipeg which are particularly interesting from a standpoint of quality and workmanship in this finest of all lines of art metal. Those who have visited New York and Chicago know the marvellous extent to which fine bronze is introduced on public and monumental buildings. In fact, it has become one of the best features of the later work. The banking institutions in Canada, with a view to obtaining the very best possible, have been introducing to their buildings this same quality of bronze work, together with granite and fine marbles.

All the good work of this kind had to be imported from American cities until very recently, when the Canada Foundry Company undertook to develop a department which would be able to cope with American competition. It has taken some four years to get into good shape but an inspection of these doors will convince anyone that the workmanship is not far short of the best that is done in New York City. It is, therefore, no longer necessary to go across the border to obtain the best results in this class of work. Even the New York architects who are doing work in Canada are well satisfied with the Canada Foundry Company production and all their current new buildings in Canada are in the hands of this company as far as bronze and ornamental iron work are concerned. The city of Winnipeg is setting the pace for Canada in the erection of fine bank and office buildings and spares no expense to make its work the very best obtainable. The Royal Bank, by Carrere & Hastings the Bank of Montreal, by McKim, Meade & White; the new union station, by Warren & Wetmore; the Great West Life, by John D. Atchison; the Bank of Nova Scotia and the proposed new building for the Bank of Commerce, by Darling & Pearson, are all in the very front rank of architectural quality.



Handsome Bronze Doors Manufactured by The Canada Foundry Company, Limited

Value of Cement Grouting

European engineers are appreciative of the value of cement grouting for repairing defective masonry, lining wells, and for making tunnel roofs water tight. In Germany a well polluted by infiltrations was put into satisfactory condition by lowering into it a sheet iron drum, filling the space between the drum and the walls of the well with Portland cement, and withdrawing the drum after the cement had set. The damaged masonry of a tunnel was repaired by injecting liquid cement under pressure. Air at a pressure of 78 pounds per square inch sufficed to force the cement into place.

Bridge Still Confident

Mr. Howard Bridge, whose system of water purification at Lindsay has met with such an unfavorable check, expresses his intention of returning to Lindsay and remedying any defects which may appear after the impartial tests which are to be made by the water commissioners of the town. He states that he will remain at Lindsay until everything is settled satisfactorily.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone

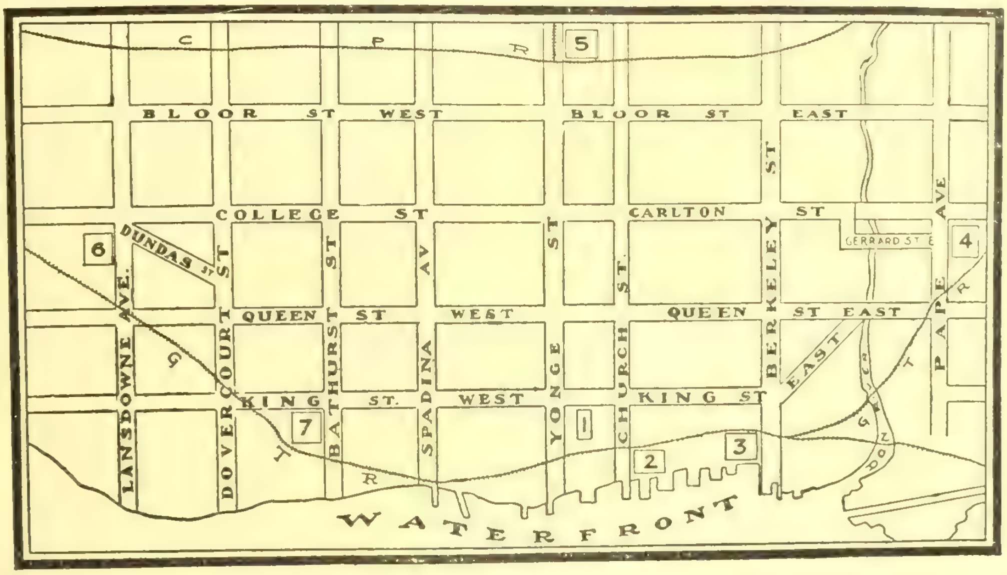
Main

4

1

5

5



No's

2,

4,

5,

6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

ROGERS SUPPLY CO., 3 King Street East, Toronto

CONTRACTORS' PLANT

BOILERS

PUMPS

TANKS

CONDENSERS

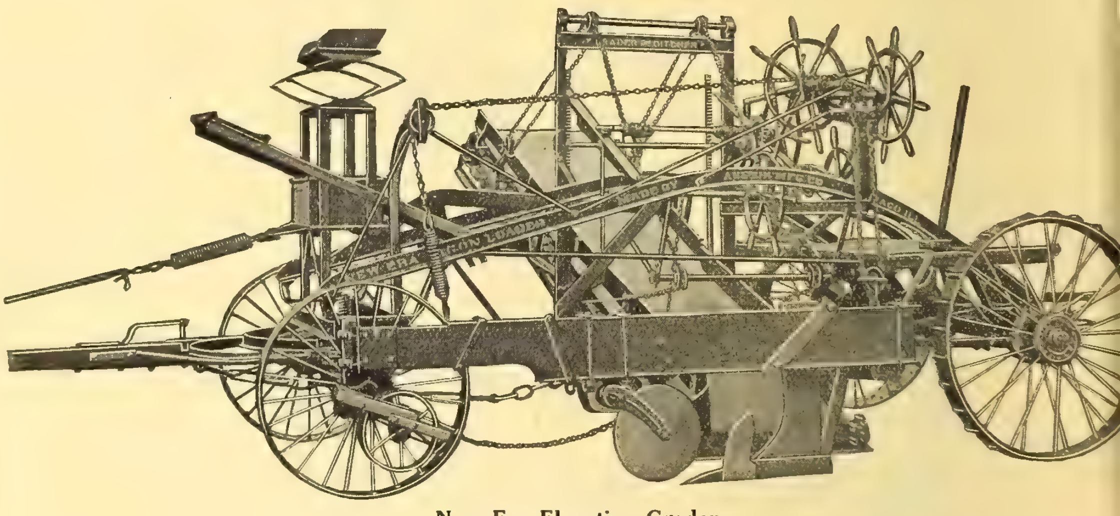
WORKS: MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

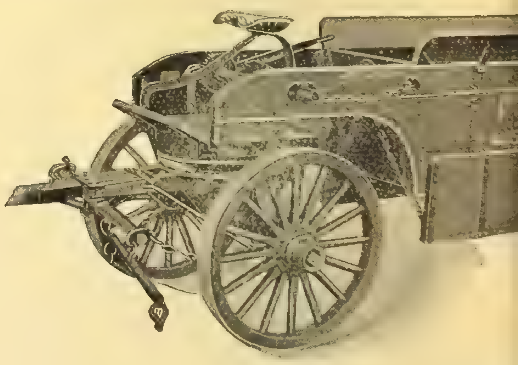
Elevating Graders

for Railroad Grading, Irrigation Work, Municip
Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment



Austin Dump Wagon

Head Offices and Warehouses:

Montreal

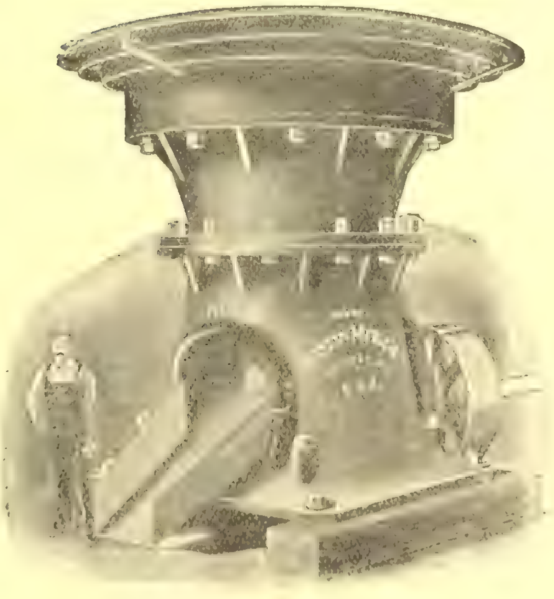
MUSSEN

mplete
Rock
Crushing
Plants

esigned and Supplied

Crushers
Elevators
Screens
Bins
Hoists
Derricks
Rock Drills
Drill Steel
Cars
Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's
Transparent Waterproofing

This material is intended for use upon cement, concrete and brick exterior surfaces for building blocks, drain tiles, and in fact, concrete construction in general, with the view of waterproofing the structure, and at the same time not staining or affecting the color or texture of the surface. One coat only is required to produce excellent results along damp proofing lines.

This material can also be incorporated in the mass structure in which event it permeates every molecule of the concrete aggregate, completely waterproofing same throughout the entire mass. This product forms an emulsion with the alkali of the cement, which is carried uniformly through the structure, producing a homogeneous waterproof result. This material is a transparent liquid and, when used for mass waterproofing, should be used at the rate of 2½ pints to each 100 pounds of cement used in the concrete aggregate.

Covers 200 square feet and upwards to gallon, according to surface.

SPECIFICATIONS.

Apply this material by means of a brush. One coat only is necessary. Use in the absence of fire, as it is inflammable. Should also be used at a temperature of 40° and upwards.

Have surface dry and clean. Wire brush old surfaces before applying.

For mass waterproofing use 2½ pints to each bag of cement, introducing same into the aggregate after the water has been added.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio

Distributed in Canada by

Stinson-Reeb Builders Supply Company **Eastern Townships Bank Building**
Montreal, Quebec

DYNAMOS MOTORS
THE NORTHERN ELECTRIC AND MFG. CO. LIMITED
TELEPHONES ARC LAMPS

Inter-phones

are savers of lost motion—abolish the thousand and one steps taken needlessly every day. Inter-Phones tug at the beard of old Father Time—hold him—make every hour of the day more productive—leave more minutes for work. Would you do without a 'phone in your house—or your office? Then, hadn't you better connect your departments in the same way?

Inter-Phones cost little to install and operate at a low maintenance charge. The time they save will pay for the installation over and over. The question is not "Can I afford to put them in?" Your problem is "Can I afford to be without Inter-Phones?" Figure it out and answer it for yourself. Booklet No. 413, free on request, tells the fullest particulars.—Send for it.

THE Northern-Electric
AND MANUFACTURING CO. LIMITED

Manufacturers and Suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone and Power Plants. Address our nearest office.

Montreal Notre Dame and Guy Sts.
Toronto 60 Front St., W
Winnipeg 599 Henry Ave.
Vancouver 918 Pender St.
Calgary
Regina

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto July 13, 1910 No. 28

Time Limits in Contracting and Responsibility for Errors

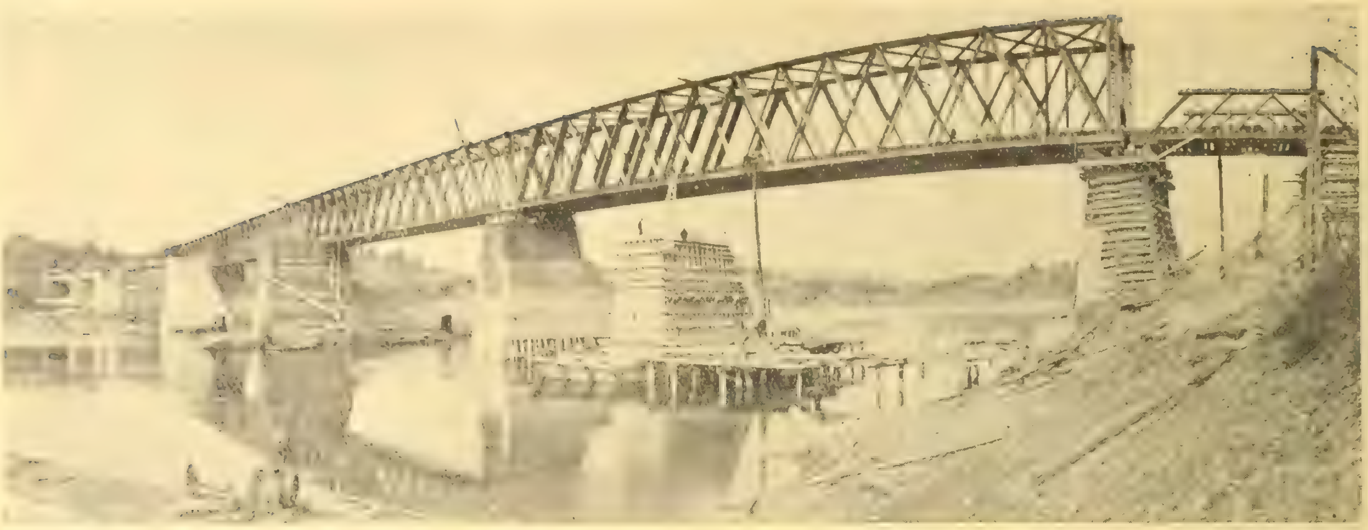
Regarding the tenders for the Quebec bridge, some criticism was heard concerning what was apparently a very limited time for the preparation of tenders. As a matter of fact, however, in this instance, intending bidders were invited by the Government to get into communication with the Quebec bridge engineers several months ago and those who availed themselves of the invitation were provided with plans as fast as they were completed. In this case, therefore, it would appear that no hardship was inflicted by virtue of the closing date being set at Sept. 1st. At the same time, however, the margin is on the wrong side. If the interests of fair competition are to be served and if there is the proper desire to serve those interests, a generous time allowance must be made in the case of all important works so as to afford every opportunity to American, British and continental firms to submit a figure. In the case of the Quebec bridge there may be some excuse for what is on the face of it, an entirely disproportionate time allowance for the preparation of plans for a work of such magnitude, but all the same the principle is violated to a certain extent. As has been pointed out before in these columns, this stinting of the time allowance is productive of many evils. In the first place, it means less competition and consequently greater cost. Then the reduced number of tenderers works towards monopoly and helps to encourage graft and all sorts of unsavory accompaniments.

If the authorities, when calling for tenders on some large work, openly discriminated against British firms there would soon be a public outcry. But what difference is there between this and so fixing the time limit that they are handicapped out of the running? It is an old saying about competition being the life of trade but it is none the less true on account of its age—rather the contrary. We are just at that stage of development now when we need all the competition we can get and it is up to us to avoid unfavorable comments on the score of treating outside firms badly. Canada has a reputation to *make* rather than to sustain, and the fair administration of matters of this kind will help her good name materially.

Time for Execution of Work—Not only [illegible] complaints about inadequate time for tendering but also in regard to the insufficient period allowed for the completion of the work. One large contractor told us the other day that in not one job out of a dozen was sufficient time allowed for the proper completion of the contract. Apparently a good many contractors take on work in a sort of Micawber-like spirit, "waiting for something to turn up" to help them out of the hole. If Providence fail to "turn up" that "something," they often fall a great deal farther than they anticipated. So much for the contractor's indiscretion, but how about the architect. Surely architects must know, or *ought* to know, that under the very best conditions a certain length of time must be allowed for certain quantities and classes of work to be properly handled. A good practical man will know when a job will keep a contractor busy for one year and when for two, and will recognize the absolute futility and injustice of compelling a contractor to agree to a time limit which is bound to beat him at the end.

Responsibility for Mistakes—Another difficulty encountered by contractors is the unwillingness of the architect to assume responsibility for mistakes which have been made by contractors in different trades, owing to lack of information or changes in the plans and specifications after the work has been let. Contractors make mistakes, and many of them—and so do architects and engineers. The difference lies in the reluctance of the average architect to admit of anything that savors of error on his part. It is not an unheard of thing for an architect to send out plans and specifications to firms with instructions to those firms to assume that they have the contract and prepare their own detail plans from the information given. Contracts are awarded and the details approved after a more or less cursory examination. The injustice of blaming a contractor in the event of some subsequent mishap is apparent. The responsibility for all details of design lies with the architect and engineer. It is essentially their business to have their plans in such shape that they can be translated as easily by the contractor, who has to figure on them in a limited [illegible]

It takes a live fish to swim upstream. Any old [illegible]ster can float down.



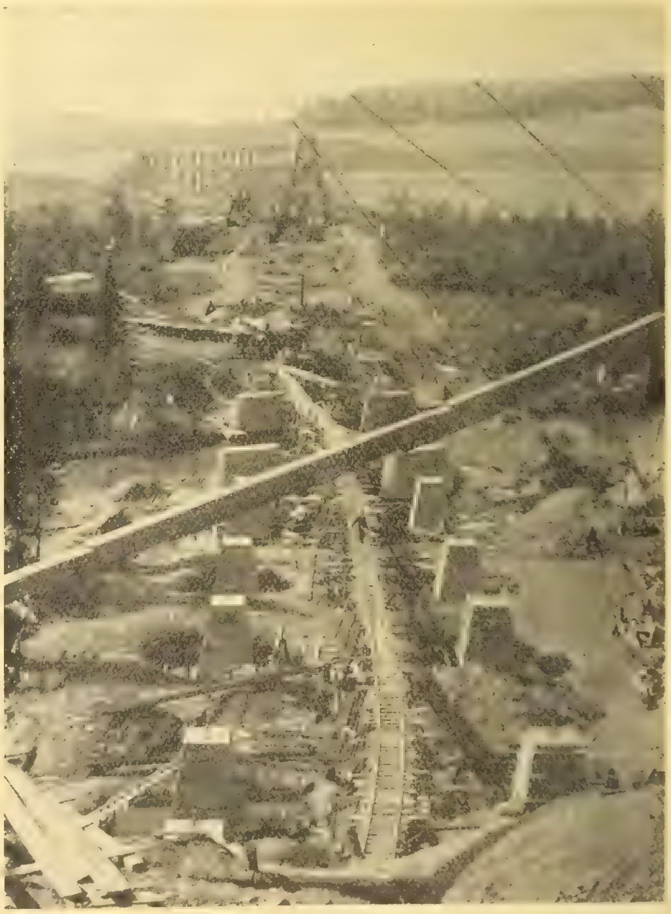
1.—C.P.R. Bridge over St. John River, Upper Woodstock, N.B.

Railroad Contracting in New Brunswick

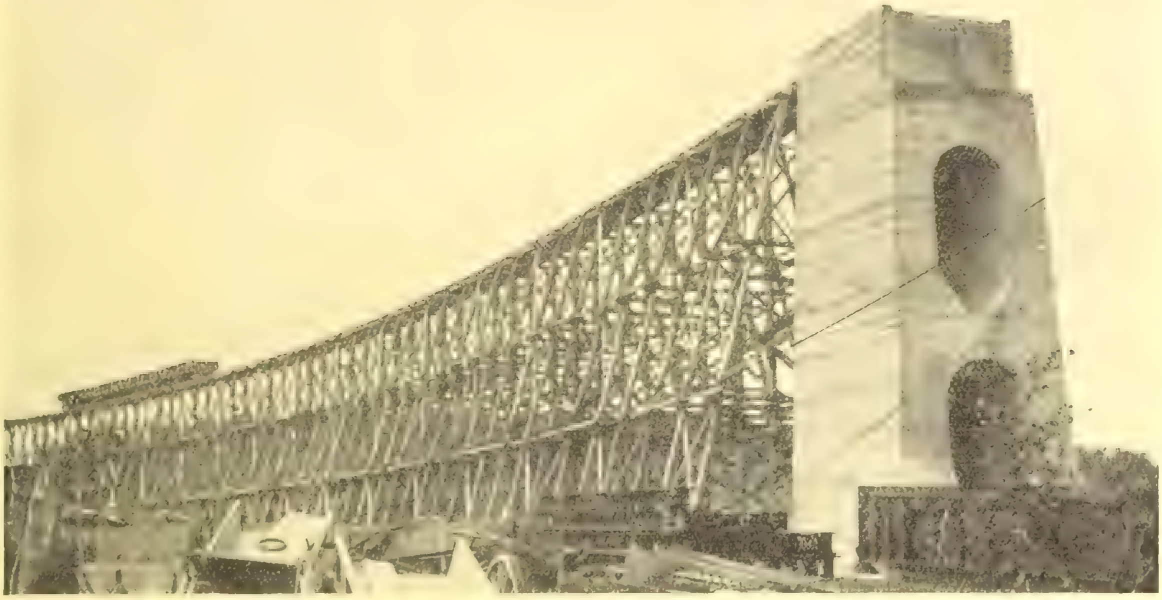
Interesting Constructional Views of C.P.R. Bridge work and Erection of Viaducts on the Transcontinental—An Account of the methods employed

The accompanying photos show some of the recent work carried out by the contracting firm of Powers & Brewer, of Woodstock, N.B. The above illustration is a view of the C.P.R. bridge across the St. John river at Upper Woodstock, N.B. This structure was erected to replace the old wooden Howe truss spans and wooden piers. It consists of four through spans and three girders resting on concrete piers and abutments. For the concrete, gravel of good quality was obtained from the Island and hauled to the mixer by a steam hoist on an inclined track. A No. 5 Smith mixer was used and the concrete was placed on a cableway of 1,350 feet span. Ledge was reached in all foundations except pier No. 6 and the north abutment. At pier No. 5 the water was 16 feet deep and the excavation was carried down to the ledge at a depth of 31 feet below water level. Pier No. 6 rests on a pile foundation 28 feet below the level of the water and 8 feet below the river bed, the excavation being carried to that depth to avoid scour. The upstream ends of piers were reinforced by granite cutwaters to protect them from the heavy run of ice and logs. Atlas cement was used for this work.

Illustrations 2, 3 and 4 are views of the viaduct at the crossing of Little river, on the Willard Kitchen Com-



2 and 3.—Work on the new viaduct of the Transcontinental Railway at the crossing of Little River, near Grand Falls, N.B.



4.—Progress view of construction on Transcontinental Railway Viaduct, Grand Falls, N.B.

pany's section of the Transcontinental, near Grand Falls. This viaduct is 1,242 feet long and 100 feet from base of rail to water level. Crushed field stone was used. The sand was brought from Macaguadavic, on the line of the C.P.R., to Grand Falls and was hauled by teams to the site of the viaduct, three miles distant. A No. 2½ Smith mixer was used and the concrete carried across the water on a trestle in bottom dumping buckets, and picked from the car and deposited at the work by derricks. International Portland cement was used. The fifth picture shows the viaduct at the crossing of Little Salmon river, eight miles from Grand Falls, on the Transcontinental Railway. This structure is 3,918 feet long and 200 feet from base of rail to water. It is perhaps the largest structure of its kind on the line. About 7,000 tons of steel will be required in its erection. Gravel was obtained by the contractors about one mile from the site of the viaduct and hauled by teams. International Portland cement was used. The concrete was mixed by three Smith mixers, one No. 5, one No. 2 and one No. 1, with side loading device. The structure crosses a swampy flat and steam pumps were constantly at work.

Another view is that taken at an early stage of operations on the Caton Brook viaduct on the Transcontinental Railway. This structure is 142 feet from the base of rail to water. Gravel was hauled from Little Salmon river, 1½ miles.

5 Caton Brook Viaduct, Transcontinental Railway

6.—Little Salmon River Viaduct, Transcontinental Railway

Unsafe Practices in the Erection of Water Tanks

The heavy loss of life and the burning of the "Herald" building in Montreal recently, following the collapse of a water tank supported by the roof, emphasize again the danger of the unsafe practices of some architects and engineers, and also the danger of making buildings of poor construction support immense weights. Three years ago, John Edwin Curtis, an insurance engineer, writing on the hazard of the sprinkling tank, criticized unsafe practices in erecting water tanks on the roofs of buildings as a water supply for automatic sprinkler equipments. His criticism was directed chiefly at the size of tanks called for by the underwriters. The smallest tank which they recommend is one of 5,000 gallons capacity. Five thousand gallons of water weigh more than 20 tons. In 1909 at least ten water tanks that were located on roofs collapsed. Several years ago, after a number of tanks had collapsed from the rusting of flat hoops, underwriters suggested round hoops, because their entire surface could be kept protected against rust by frequent painting. This apparently had the desired effect, as there is no record of a tank collapse due to the rusting of round hoops. The wisdom of placing tanks on the roofs of buildings of poor construction is another matter. Ten thousand gallons of water weigh more than 40 tons. Thirty thousand gallons, the capacity of the largest roof tank ever called for, weigh more than 124 tons. In many instances the additional weight of the supports may be a big item. The gravity roof tank is an important factor in automatic sprinkler protection, and the Montreal disaster demands the fullest investigation to determine the cause and on which to base new requirements to remove this danger. A careful inspection of all roof tanks that are supported by old buildings is also in order. Some engineers have recommended a single water supply from a street main under favorable conditions.—Insurance Engineering.

Economy of the Piece Work System in Handling Supplies*

If we are going to get the largest possible output for the smallest cost, we must interest the man doing the work more than paying him by the hour. A man's interest must be vital if we are to get the best there is in him. We must pay for what we get, and not for what we do not. We must get 100 cents worth of work for every dollar paid out. This the piece work system accomplishes, as its organization and introduction shows.

At first blush it would seem to be a difficult matter to resolve the handling of supplies into given factors or units. This is not so, as we have a unit to issue or receive everything we handle in the store department, and a record to refer to that is permanent. Lumber is handled per thousand feet B.M. Iron, castings, coal, sand, etc., are handled by the ton. Pipe is handled by the foot. Mixed merchandise is handled by per package of 100 pounds or less, over 100 pounds to 200 pounds, etc. Filling requisitions and delivering material to the shops is handled by per item, per piece or per pound, depending upon the kind of material and the local conditions.

Filling requisitions and delivering material shows a very large saving put on piece work, due to the amount of lost motion that creeps in under the day work basis. Shop men will ask what has happened to the store men after they have been put on piece work, as they no longer stop to talk, but drop the material and hurry away for more. The men group their work, taking or getting all the material wanted from the different sections at one time. One foreman, planning the getting and placing of material, is only one part efficient as compared with a whole gang of four to eight men planning the same thing. In establishing piece work for a delivery gang composed of foreigners, who did not know the material and could not understand English, the prices were based on what was considered fair. The foreigners could not make one-half their day rate with the prices set, and were transferred. English speaking laborers were hired in their place, and they, being able to use their heads, made from 30 to 50 cents per hour.

The men should be given to strictly understand that after a price is approved it will not be changed unless conditions are changed. They can make as much money as it is possible for them to make, and will be paid accordingly. As soon as the men are assured that they will be paid for what they do they will work with their heads as well as their hands and feet, and will take advantage of everything possible. For instance, in one of our yards a derrick gang use long bridge bolts to handle 6-inch cast iron pipe. These bolts are put in the end of the pipe to slip the sling around, enabling them to handle very quickly six to ten pieces at a time. These bolts are carried on the derrick to be used when needed. When loading a small order the men run ahead of the derrick with bolts and sling and load the pipe without stopping. It is impossible to get work done this way at an hourly rate, but there is money in this method for both the men and the company, as shown below:

Work done on hourly basis on which price was based:

Labor	$2.50
Use of derrick	2.00
Total	$4.50

Work done piece work in one-half the time:

Labor, P. W. rate	$2.00
Use of derrick	1.00
Total	$3.00

Saving, $1.50, or 33⅓ per cent.

We had four men in one of our lumber delivery gangs and the day we were about ready to start piece work one man quit, and the other three refused to work until another man was put in his place. The piece work system was explained to the three men, and they were asked if they would do the work on this basis, which they agreed to do. Soon after, one of the three left the service of the company, and the remaining two are handling this work, together with a large increase, in about 70 per cent. of their regular working time, making a high rate of pay. The company is saving one man's time and about 30 per cent. of three men's time on this particular work.

At one of the large icing stations, where an average of 100 cars per day are iced, and some days as many as 250 cars, it was necessary under the day work system to take a large force of men from one of the other departments to help during rush hours. However, since piece work has been installed the regular force has handled the work without delaying a single train or having a complaint from the shippers. The men know the more they hurry the more they make.

On one of the scrap docks it was impossible under the day work system to keep the pile of miscellaneous mixed scrap sorted and cleaned up as fast as it came in with the regular gang assigned to this work, it being necessary to put on additional help to prevent congestion. Ninety days after piece work was installed the regular gang cleaned up this scrap without additional help, and now take care of it and have time to do other work; yet a better foreman than the man in charge of this rock cannot be found.

---

*A paper by D. C. Curtis before the Railway Storekeepers' Association, St. L[illegible]

It is impossible to work unintelligent foreign laborers to advantage. A gang cannot be divided, sending one man for a given article, another to the shop for manufactured material and have others sorting out material. The foreman has to take the whole gang with him, or have part idle, to get even a given size of bolt or article of any kind, as the thing wanted has to be pointed out and motions used to direct their movements.

With the piece work system we are able to hold the men after we have them educated. In May, 1908, a storekeeper hired 50 Austrians who had just come to this country, and they, after becoming familiar with the conditions, were put on piece work. Thirty-five of the original 50 are still working for this storekeeper, one having died and the others leaving the service. The men are making good wages, and it is needless to say they are an efficient force. For increased and intelligent effort men make enough for the work to be attractive. The longer men stay, the more proficient they become, the more money they make, the fewer mistakes and breakages occur, and discipline is easier.

Piece work keeps men and methods of doing work out of ruts, as the men are continually scheming short cuts and new kinks. It gives us machines and tools with which to handle work quickly. To show a saving in having machinery to handle material is a very simple problem in arithmetic when on a piece work basis; i.e., lumber handled by hand costs 5 cents to 85 cents per 1,000 feet B.M.; with a derrick, 15 cents per 1,000 feet B.M.

Piece work forces the storing of material in the most convenient places for handling. In one of the large new storehouses recently built the connecting rods for engines are kept in a closed rack in the centre of the house, without lifts of any kind to handle them with. Piece work would very quickly show the saving to be made by putting these rods where they could be handled with a small crane at a great saving.

Piece work gives a contented set of men, each man in business for himself. Men would rather work piece work than day work, as is shown by the engine men and trainmen being paid by the mile, miners by the ton, etc. These men would not think of going back to the hourly unit. The rapid, intelligent workman receives wages in proportion to work done. Ability is rewarded.

Report on Montreal Water Supply

Messrs. Fuller & Hering, the New York experts who were engaged to report upon the purification of the Montreal water supply, have issued their report, a voluminous document covering 150 typewritten pages. The report begins by stating that Montreal Island does not afford a water supply by means of artesian wells, but that a gravity supply from the Laurentians is feasible, though it would also have to be filtered, and the cost would be much more than water from the St. Lawrence. The cost of the Laurentian supply is estimated at $12,000,000 for 50,000,000 gallons a day, and $18,000,000 for 100,000,000 gallons daily.

The report discusses what should be done to convert the raw river water into a good, safe, drinking supply. The engineers estimate that the cost of filtering a supply of 50,000,000 gallons a day would be $1,500,000, exclusive of the land required.

The engineers also discuss the question of the hardness of the St. Lawrence water proper, as that is the water proposed to be supplied by the new intake, but they do not find it objectionable.

They inform the city that the filtration plant can be completed in a year and a half.

In substance, the finding of the Iew York experts is a confirmation of the works outlined by Supt. Janin. It prefers the river water to the lake water, and approves of the extension scheme of the aqueduct, which has been in progress for two years.

Pointers on Cellar Excavation Work

We are quite likely to slight the parts of a building which are out of sight, and the cellar of a house is one part which sometimes gets slighted more than it should.

It is generally best to have a cellar under the entire house, but in cases where this is not desired care should be taken that the excavation for the walls are sufficiently deep to avoid trouble from frost and to provide good drainage, so that there will be no large amount of water under the walls.

In excavating for the wall it is well to go eight or ten inches beyond the line of the walls. This gives a chance to lay a line of tile outside the wall and have it low enough to take care of all water which may ever be there.

You are likely to get a better wall excavating beyond its face than you would if it were laid against the bank. Then you may have the wall plastered on the outside and may have the dirt puddled and rammed in against the wall, all of which tends to make a dry cellar.

Another reason for excavating beyond the wall is that you want a footing course which shall extend at least six inches beyond each side of the wall. This may be of broken stone or of concrete and should be entirely below the level of the floor. You should also see that the drain is below the level of the floor and that the floor will have a slight slant toward the drain.

In places where drainage is not practicable, additional precautions should be taken to guard againt trouble from frost. This means to make the excavations and footings deeper and to keep the water out of the wall by waterproofing the outside.

Excavations for porch piers or for any wall, not enclosing a cellar, should be deep enough to have the bottom below frost, from three to four feet.

The same caution should be observed in excavating for drains. The best method of doing the excavating will depend largely on circumstances. In most cases, a team, plough, scraper and wagon can be used to good advantage.

In some cases it will be desirable to save the top soil for grading. If this is done it must be removed to suitable places. The proper disposal of the dirt will depend on the nature of the soil, the depth excavated, the nature of the site and the size of the cellar.

After ploughing the area and scraping out as much as is practicable of the dirt, we can use a wagon by leaving an easy grade at one corner or by digging out where the cellar-way is to be. If there is not room to turn a team and wagon in the cellar, they can be backed in. When the site is on a hill, considerable dirt can be wheeled out in wheelbarrows, either through the cellar-way or through excavations for the drain.

If the cellar is small and not too deep a man can throw out considerable dirt with a shovel, but, of course, cannot throw it far.

It will generally be necessary to [illegible] the corners at the last and there will be enough dirt to be shovelled out after making use of other methods.—National Builder.

Selection and Care of Field Equipment

Careful Study of Conditions Essential in this as in every other Department of Contracting—Practical Hints worth noting

In proffering advice to the experienced and careful contractor as to what he should select for an equipment in order to carry along a certain piece of work, about all there is to say is, "Study conditions," and the writer knows from experience that a great deal is embodied in those two words.

Many a dollar has been wasted or thrown away that could have been honestly put away as profit at the end of a job simply because the contractor did not think it worth while to spend the time to go to the comparatively small expense it would mean to look over the situation thoroughly and in detail and ascertain just how it differed from his last piece of work or in what respects an entirely new equipment would pay for itself. For instance, wheel scrapers and bottom dump wagons are money makers for a contractor if the conditions are such that they can be used to advantage; but the former is a poor thing to get out rock with, and the latter is equally poor to deposit excavated earth with or to bring sand or gravel to a job when dumping area is limited. Too much cannot be said on this subject, as immense "leaks" from the profits of a well engineered and carefully figured contract are often due to the fact that a proper billed equipment was not sent to the job.

It costs money, money, money, to "try to make things do," when they are entirely unsuited to the work in hand. A mixing board and a half dozen laborers will do very well for a few yards of concrete; on the other hand it will be found that a stone crusher, mixers, sand conveyors and all apparatus of like nature will yield good returns, if they are not absolutely necessary, if the work is of sufficient magnitude and the conditions warrant their installation.

Care of equipment is another very important factor in the success of a contractor. There has never been a dollar made by economizing on the care and attention due to machinery, tools and material used in carrying along construction work of any kind.

An hour's labor by an ordinary man and a half-gallon of oil or grease used where required may save a hold-up of an indefinite number of mechanics and possibly a bearing, friction clutch or something similar that it may require several days to replace; and all this means money.

The care of ropes cannot be too carefully attended to as it is not only poor economy to allow a rope to be cut, chafed or worn out before it has done its duty, but almost any thing in the way of a damage suit may result from the use of a rope that is unfit for the service demanded of it.

The writer has seen absolutely new, clean ropes fail, with an ordinary load, due to the fact that they had "dry rotted" in warehouse or store before being put into use; and at times it is hard to discover a fault of this kind as such a rope may be weak in but one foot in a thousand of its length.

In order to guard against trouble of this kind the best advice is to buy of a house that is constantly turning over its stock so that there is no such thing as old stock in the place and no time given for dry rot to set in.

Do not be afraid to allow a sufficient margin or factor of safety in all kinds of apparatus used in rigging and hoisting as it not only pays to be safe, but it will be found that good results will be obtained in wear and tear if the equipment is heavy enough.

Figure out what blocks, shackles, etc., will seem to be required and then add a few snatch blocks to the total, as the jobs are few on which about every snatch block in reach will not be of service at one time or another.

In erecting steel work the best equipment is none too good, as the nature of the work and the men engaged on it demand a great many tools of the best quality.

A poorly fitting "spud wrench," or one of poor quality will mean time lost and possibly a man dashed to the ground; and this applies to all tools for this class of work. A good rivetting gang will keep a heater busy, and it is poor economy to furnish him with a poor forge.

Four men are required to drive button-head rivets and all must work at the same speed; and if one man is believed, because of lack of ability or energy or because he is hampered by poor tools, the result at the end of the day is the same in work done and the cost of it, and it is strictly "up to" the man in charge in either case.

No doubt it would be out of place for the writer to enumerate what tools are required in field work, but a few suggestions based on personal experience may be of value to some of our readers, and make the reading of this article worth while.

If there is to be any amount of "lugging" or "bulling" piles, heavy timbers, steel columns, or similar shapes, a tip up cart will be a valuable asset.

A "steamboat ratchet" may be seldom used, but it is generally needed badly when at all, and will often solve a proposition that would be a difficult one without it and save the labor of a number of men.

Good tools are never expensive in the long run, and cold cuts, rivet ousters, chisels of the various kinds and shapes, and tools in general that will "stand" and do the work required of them, will yield better results and show a much greater profit than those costing less and which require much more dressing and grinding.

Steam, air and electrically driven tools and machinery are valuable if conditions warrant. And again the same warning "Study conditions" comes to the front and makes itself felt.

If the writer felt that this article was for the benefit of beginners, much could be written in the way of advice as to what equipment would be required on various kinds of actual field work, but he assumes that his readers are experienced, careful men and the suggestions and advice given herewith, are given in the hope that his experience and the little points noted, may have been overlooked by some who are engaged in construction work and be valuable to them. The Contractor, Chicago.

John Laxton and Thomas McQuillan, carrying on a contracting business under the firm name of McQuillan & Company, have, after five years, secured judgment against the township of Whitby and the Water and Light Commissioners of the township, for upwards of $1,300 for the installation of a system of waterworks. The case was tried on September 18, 1905.

Hydro-Electric Plant at Kenora

The Kenora 5,000 horse power hydro-electric power station is one of the most interesting of moderate-size plants in the Province of Ontario, located at the northerly end of the Lake of the Woods. The town of Kenora is situated near the point where the lake empties into the Winnipeg river and has a population of about 8,000 people. The Rainy River district is drained by the discharge of the Lake of the Woods through two outlets entering the Winnipeg river, the drainage area being about 23,000 square milees. There is a fall of about 21,000 feet at the end of these outlets and about 5,000 horse power is developed when the complete plant is operating under normal conditions. About 750 horse power is utilized for operating the pumps of the Kenora waterworks system, and for lighting the streets, stores and residences, while about 1,000 horse power is utilized by the Maple Leaf flour mills. The accompanying illustration shows the power house under construction. A timber crib coffer dam was built in an average depth of water of 16 feet at a point about 200 feet above the head of the falls in order to unwater the side of the power house. The total length of this coffer dam was 175 feet and it was built under difficult circumstances due to the swift current at this point washing out the sand and gravel and undermining the crib. The leakage through the dam was largely overcome by sinking large sections of entwined roots and weeds of a floating island, in front of the coffer dam. The lower coffer dam below the power house site, measuring 265 feet in length, was constructed across the stream from bank to bank in water varying from 17 to 24 feet in depth. Excavation was started as soon as the water had been pumped out between the two coffer dams, the total depth of the excavation before bed rock was reached being 28 feet as a maximum. The concrete work included the placing of about 7,500 cubic yards, the excavated material being about double this amount.

The power house was constructed of concrete [illegible] and steel, the stone for the concrete consisting of a very hard rock, being quarried in the bed of the river at the side of the falls. The buildings extend completely across the stream from shore to shore, being joined by heavy concrete walls to the rocky banks. There is a log-sluice provided through the wall on the western end of the power house in order to take care of any lumbering which may require a future passage.

It may be stated that the wheel chambers are covered with a 6-inch slab of reiforced concrete, forming a floor with manholes in the same, 7 feet in diameter, for getting at the present water wheel units and the installation of future turbines.

There are seven concrete flumes 18 feet wide, with concrete dividing walls measuring 4 feet. The central flume is divided into two equal compartments by a 2-foot reinforced concrete wall. It contains the two exciter wheels, thus providing for six power units and two exciter units.

There is a 12-inch cast iron pipe and valve provided for filling each flume in order to equalize the water pressure on both sides of the head gate before opening them. There is also provided an 8-inch valve for emptying the flume for repairs or in case of inspection of the wheels.

Starting the Forms in the Construction of the Kenora Power Plant.

In this plant there are three main hydraulic units each consisting of two pairs of 10-inch turbines of the Samson type, mounted on horizontal shaft and with flange couplings direct connected to the electrical generators which operate at a speed of 150 revolutions per minute.

Lombard water wheel governors are utilized for controlling the large turbines which drive revolving field alternators of the three-phase type, supplying a current of a frequency of 60 cycles per second and a pressure of 2,400 volts. These revolving field generators have a capacity of 625 kilowatts each, the current being conducted from these machines through lead covered cables carried through ducts in the floor and up to the face of the bulk head wall to the switchboard of blue Vermont marble, consisting of 12 panels.

The switchboard includes three generator panels for the present installation and three panels for future alternators, together with one exciter panel and five feeder panels, no pressure above 110 volts being found on the front of the switchboard, the arrangement being such that the switches, bus bars and feeder mains are to the rear of the operating board a distance of [illegible] feet.

Construction of Extensive Intake System

Montreal Water & Power Company's Interesting Project — Problems Encountered by Engineers and Methods Employed in their Solution

An interesting installation of a new intake system has just been completed for the Montreal Water & Power Company. This important contract was carried out for the company by Messrs. Laurin & Leitch, construction engineers, who commenced initial operations in May, 1909. The bulk of the work was done in the fall of the same year and was finally turned over to the owners a few months ago.

The Montreal Water & Power Company supplies water to many of the outlying districts of Montreal, including Cote St. Paul, St. Henri, St. Cunegonde, city of Westmount, Cote des Neiges, Outremont, St. Louis, St. Denis, Delorimiere, and Maisonneuve. For some time they had been handicapped in supplying their customers owing to the limited capacity of their intake pipe, which was constructed of wood, 36 inches in diameter.

General View of an early stage of the work, showing Dredge Pipes, etc.

The company's works and pumping station are located on that section of the St. Lawrence river to the south of the Island of Montreal and opposite Nun's Island. In constructing the new intake system it was decided to locate it at a point about 1,200 feet further up stream and close to Nun's Island.

By going further up it was estimated that no purer supply of water could be obtained. This, however, presented an objection on account of the muddy water that would have reached the old intake pipe, so that it was found necessary to dig a channel inshore of the old intake cut to protect the old source of supply.

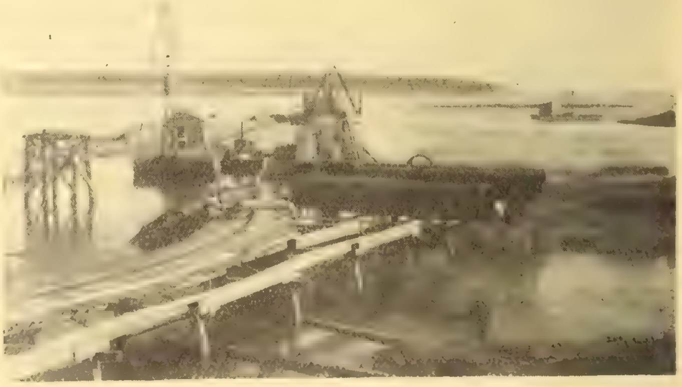
Material Used—For the new intake, lock bar steel pipe five feet in diameter by 7/16-inch in thickness was employed, about 2,000 feet being required.

View of Trestle, Showing Diver's Scow.

In dredging the channel for the pipe about 1,000 feet of rock were encountered and this was removed by blasting. In all, approximately 4,000 cubic yards of rock excavation were made.

The work was carefully planned and while about 50 men were employed on the average, it was more a matter of machinery than of men. For excavation one 2½-

Two Trestles for lowering Pipes. One 150-ft. length has just been launched here.



Three Sections of Pipe ready to be placed in position. Note Pile Drivers and Dredges.

yard dipper dredge and a floating derrick and pile driver were used, also scows and other marine apparatus.

Method of Laying Pipe—The pipe was riveted and caulked up in lengths of 150 feet with steel bulkhead placed in each length. When ready these were launched and floated out into position and by means of a special valve the air was emitted and water let into the pipes. In the meantime the 150-foot length of pipe was suspended from trestles and lowered gradually by the workmen until in their required position.

The different lengths were then connected by 14 special submarine joints.

The intake crib consisted of an extensive timber structure, 60 feet by 30 feet. This was filled with stone and capped with five feet of concrete.

This intake construction has cost the Montreal Water & Power Company in the neighborhood of $200,000, but they are now assured of a continuous water supply. At present they are delivering 20,000,000 gallons a day throughout the city of Montreal.

Economic Aspects of City Planning

City planning is designed to secure the orderly development of a city so that each section will be arranged for the purpose for which it is best and most economically adapted, and so that a harmonious entity will result. This development must be for the common good and not for private gain, said B. C. March, before a meeting of municipal engineers in New York.

City planning in this country has been chiefly æsthetic. In foreign countries much more emphasis has been laid upon the need for improving the condition of living of the poorer classes and setting a high standard of housing for unskilled wage-earners.

We have inverted the procedure in this country. American cities farm out their poor to be exploited by the land speculators. The American system of laissez faire has resulted in permitting the shrewd and grasping real estate speculators and tenement sweaters to make fortunes from the poverty stricken members of the community.

These are some of the important features of comprehensive city planning:

(1) Proper housing for the city's masses for a reasonable proportion of fair wages, and within easy access of their work.

(2) Direct and adequate roads connecting the main business centres of a city with smaller roads of such width and construction as not to impose an unnecessary and burdensome cost upon the occupants of small houses.

(3) A proper system of water supply, sewage disposal and of pipes and wires.

(4) The economic location of factories and the prohibition of factories in districts where they will be an injury to the neighborhood; and as a necessary corollary, the provision of means of carrying freight.

(5) The elimination of the cost of carfare to the working population, so far as possible.

(6) The decentralization of the city's business, pleasure and educational interests.

(7) The provision of adequate parks, playgrounds and open spaces with space for public buildings to furnish not merely sites, but settings.

(8) Such control over the location and volume of buildings for manufacturing and other purposes as will enable the city authorities to anticipate and provide adequate means of carrying passengers.

(9) The control of the development of new and unbuilt sections of a city, and the incorporation of adjacent area so that their development may similarly be controlled.

The standard of housing for the working population is a matter which must be determined by each city and may require variation for different sections of the same community. In order to secure the harmonious development of a city in the interest of all the citizens, including the owners of the valuable property lying in the business sections of great cities, it is necessary that we should have a proper extension of the police power of the city, and that this should involve not merely regulations as to fireproofing, but also restrictions on the use of buildings. In addition there should be an extension of the taxing power of the state, which should be considered part of the police power. Under the police power there should be included an extension of the control of the city over the location of factories.

The most important point to be considered in city planning is the preservation of the outlying sections of the city from the duplication of these evil conditions recognized and deplored in the built-up sections. To prevent the duplication of the deplorable conditions of most cities requires not only a reasonable amount of genius, but equally a considerable amount of courage on the part of city officials, and this is the task to which all our cities are summoned.

The elimination of the cost of carfare to the working population is a most important feature of proper city planning. Most American cities have lost their heads over rapid transit and are obsessed with the idea that daily wage earners want to spend an hour and a half or two hours a day riding to and from their work. The cost of transportation is a serious economic waste. There are nearly 700,000 workers in factories in New York. A minimum of $20 each for carfare means a waste of more than $21,000,000 a year, which is nearly 1-11 of the total wages paid in 1905 in all manufacturing concerns in the city. The time spent on the cars is also a serious loss which should be prevented by the distribution of factories and offices and the decentralization of the various interests and business sections in great cities.

Winnipeg Builders' Exchange

At a recent meeting of the Winnipeg Builders' Exchange a revised code of practice and several new bylaws were adopted. A noteworthy clause in the new code of practice is that architects shall accept the lowest tender. It was stated at the meeting that it was no unheard-of thing for a contractor to go to the architect after the tenders were opened and offer him a new bid below the lowest tender.

Representatives of the committee of seventy members appointed to canvass the 400 members of the exchange with a view to having them take stock in the Selkirk centennial, submitted a report of progress. The exchange hopes to dispose of stock to the value of $75,000.

Some interesting comparisons of the production of structural and building materials in Canada for 1910, covering cement, clay, stone, lime and similar materials, have been made by the Canadian Department of Mines. These show cement produced during the year at a value of $3,709,954, while clay bricks of all kinds, including common, pressed, paving, moulded and ornamental, were produced to the value of $3,577,426; 3,601,168 bushels of lime were produced, valued at $[illegible]. The output of stone was valued at $[illegible]; limestone, $[illegible]; granite, $282,320; slate, $13,496; sand-lime brick, $152,856; fire clay and products, $[illegible]; fireproofing and architectural terra cotta, $170,211.

Tests of Brick and Terra Cotta Columns

Strength of Brick and Block Structures Affected Greatly by the Quality of Mortar Used—Noteworthy Features of Tests

The results of some interesting tests of brick and terra cotta block columns made at the Engineering Experiment Station of the University of Illinois, may prove helpful to some of our readers.

For brick, stone and terra cotta masonry structures designers commonly use stresses which are low in comparison with the strength of the constituent materials. Various reasons exist for this—possible variations in material, chance for poor workmanship, opportunity for settlement and resulting unconsidered stresses, the desire to avoid tensile stresses in masonry, imperfect knowledge of the properties of the completed structure, etc. In some types of structure mass and volume are important considerations and strength is subordinate. In many applications, however, the strength of the structure is of first importance, and a knowledge of the actual properties of the structure is essential to safe and economical construction. Frequently designers use stresses as high as their information and the usual rules of practice will permit and make sections as small as these considerations warrant. The utilization of the working capacity of a structure is generally advantageous. This is especially true when the better grades of material are used and when the workmanship is known to be first class. Much information is available on the strength and other properties of constituent materials like mortar, brick, stone and terra cotta, but relatively little is known of the properties of built-up structures. Anything that adds to our knowledge of such construction should be helpful; and it was with a view of obtaining further information on the properties of short built-up columns or piers that the tests herein described were undertaken.

Dimensions of the Columns

The work described in this bulletin includes tests of 16 short columns or piers of brick and 16 columns built of terra cotta blocks. Although long column action seems not to enter into these compression test pieces, they will be termed columns by analogy to the use of the term column for other compression members of not greater slenderness ratio. The length varied from 10 feet to 12½ feet. In lateral dimensions the brick columns were 12½ x 12½ inches, and in the terra cotta block columns the range was from 8½ x 8½ inches to 17½ x 17½ inches. The brick used in the construction of the columns were of two grades—an excellent class of building brick and a soft grade selected as representative of inferior brick. The terra cotta blocks were of good quality. Different qualities of mortar and different grades of workmanship were used. The loads were applied continuously to failure in most cases, but tests were also made with repeated applications of the same load. Central loading of the column was used in most cases, but in some tests the load was applied eccentrically.

All the tests were made in the 600,000-pound Riehle vertical screw testing machine in the Laboratory of Applied Mechanics of the University of Illinois. The machine head moved at the rate of 0.05 inch per minute; except in some cases, where the load was repeated, when a speed of 0.10-inch per minute was used. The load was generally applied by increments of about 25,000 pounds on the column, but for the columns built of lean mortar or of clay brick the increment was smaller. The load was applied through a spherical bearing block, except where the column was loaded eccentrically. In arranging the columns for eccentric loading, a ½-inch square steel bar about 20 inches long was placed 1-inch off the centre of the column under the lower bearing block, and a similar bar in a corresponding position on top of the upper bearing block. The load was applied to the column through these bars.

In all of the brick column tests the first evidence of distress observed was a faint popping sound which seemed to proceed from the interior of the column. As the load was increased the popping noises were heard more frequently and were louder. As the load was further increased the action of the columns depended to a great extent on the quality of the mortar used. The columns in which the richer and stronger mortar was used gave little or no additional evidence of distress until a load a little below the maximum was reached, when spalling of the mortar at the corners of the column, or the formation of longitudinal cracks through the vertical joints gave warning of impending failure; after the beginning of spalling or the formation of longitudinal cracks was observed, the failure was generally very sudden and complete. In this class of columns (those with 1:3 Portland cement mortar) the debris shower that failure was precipitated by the formation of longitudinal cracks through each vertical joint. These cracks generally extended throughout about the upper two-thirds of the length of the column, beginning near the middle and extending both ways. Such failures were extremely violent and sometimes involved hazard to observers and often proved destructive to measuring instruments. The failures came with such slight warning that, despite repeated efforts, the operator was unable, except in two tests, to stop the movement of the testing machine after evidences of failure were observed in time to avoid reducing the upper two-thirds of the column to a mass of broken bricks and mortar scattered over the laboratory. The design of this machine is such that it may be stopped and the motion completely reversed almost instantly. The columns referred to were the ones laid up carelessly. They were less rigid than the others of the same materials and hence took on load more slowly.

Features of the Tests

The phenomena of the test of the clay-brick columns did not differ greatly from those of shale brick with 1:3 Portland cement mortar, except that on account of the reduced rigidity the load was applied more slowly and the failures were less sudden and violent.

The failures of the columns in which the 1:5 Portland cement, natural cement or lime mortar was used were similar to those described above, except that they rarely got beyond the spalling and cracking stage. In these tests the formation of the vertical cracks could readily be observed. The freedom from sudden collapse was probably due to the yielding of the joints and the fact that the testing machine does not follow such yielding instantaneously. It must not be inferred that under an actual load such columns would not have failed as suddenly and completely as the others. Where natural cement or lime mortar was used the mortar gradually disintegrated and reduced to powder.

No direct comparison of the strength of the lime mortar columns with the strength of the mortar can be made (since no tests of the lime mortar were made), although it is evident that the low values observed are due to the low crushing strength of the mortar. From the action of these columns during the tests it seems evident that the lime mortar broke down at a load which was proportionally very much lower than that carried by the cement mortar. From the early signs of distress exhibited by these columns it seems doubtful if they would continue to carry a load greater than about one-third the maximum load given in the test, while for the shale brick columns built with Portland cement mortar, the load at which the first signs of distress were observed is from 50 per cent. to 75 per cent. of the maximum load carried.

For the two columns built of underburned clay brick and 1:3 Portland cement mortar, the average load carried was 1,060 pounds per square inch. The ratio of this load to the load taken by the shale brick columns tested at the same age is 0.31. The ratio of the crushing strength of the clay brick to that of the shale brick is 0.37.

It is evident that the strength of any brick or block structure is influenced greatly by the quality of the mortar used. These comparisons indicate that for the columns tested the strength of columns built from the same brick is closely proportional to the strength of the mortar used in their construction, and the strength of columns built of different brick using the same mortar is closely proportional to the crushing strength of the brick. Of course, these conclusions may not be expected to hold for all combinations of brick and mortar. A mortar might be used of such low crushing strength that the strength of the poorest brick would be great in comparison.

These tests indicate that the crushing strength of the brick is as important a factor in the strength of a structure of this kind as the quality of the martar used. The most economical structure would seem to result from using a mortar comparable in strength with the brick. Such considerations are generally unnecessary except in design of columns, piers, etc., which are to sustain excessive unit loads.

If the load at which the column first shows signs of distress by popping sounds represents the maximum permanent load which the column would carry, then this load is the one on which the factor of safety should be based, and not the load carried momentarily before failure.

The terra cotta clock columns were built and tested in two lots, an interval of about one year separating the times of making the tests. The cement used was the same brand in both years though the lots were different. The columns were generally made in sets of two, each set being constructed and loaded similarly. The tests resembled those of the brick columns in many respects.

The Terra Cotta Columns

Generally the terra cotta block columns gave no signs of distress until a load near the maximum was applied, when cracking noises similar to those described for the brick columns were heard. This was soon followed by the formation of longitudinal cracks through the vertical joints or the spalling of the horizontal mortar joints at the corners of the column, either of which was immediately followed by sudden collapse of the column. The failure of these columns were even more violent than those described for the brick columns. The smaller columns showed more variation in the manner of failure than the large ones. The characteristic form of failure for the 12½ x 12½-inch columns was a sudden total collapse immediately following the appearance of longitudinal cracks through the vertical joints near the middle. Failure sometimes occurred with no warning except the continued shortening of the column under the increasing load.

The columns loaded eccentrically failed by splitting from end to end along the vertical mortar joint which was parallel to and nearer the loading bar.

Both brick columns and terra cotta block columns gave high strengths in all cases where strong mortar and care in buildings were used. For central loading, the strength of the brick columns ranged from 3,220 to 4,110 pounds per square inch, and the strength of the terra cotta block columns from 2,700 to 3,790 pounds per square inch, the columns having the highest resistance not failing at the full capacity of the machine. The effect of the strength of the mortar is apparent in the carrying capacity developed in the columns; lower loads were found in columns built with 1: 5 Portland cement mortar than in those with 1: 3 Portland cement mortar, still lower loads in those with 1: 3 natural cement mortar, and still lower loads in those having 1: lime mortar. The effect of the quality of the brick is shown in the columns made with inferior brick, which carried only 31 per cent. as much as columns built with the better grade of brick. In the case of the terra cotta columns, the blocks which were culled out as somewhat inferior gave a column strength perhaps 30 per cent. less than the columns built with superior blocks. The effect of the attempt to represent hurried or careless workmanship in two brick columns and in three terra cotta block columns was a loss in strength of about 15 and 25 per cent., respectively.

The ratio of the strength of the columns to the comprehensive strength of the individual brick and block is of interest. In the well built brick columns loaded centrally the ratio of strength of column to compressive strength of individual brick ranged from 0.31 to 0.37, and in the underburned clay brick column the ratio was 0.27. In the terra cotta block columns with central loading the ratio of strength of column to that of individual block was 0.74 for the incompleted test and 0.83, 0.85 and 0.89 for the others. If, as seems to be the case, the strength of the brick or block to resist cross breaking is an element in determining the strength of the built-up column, a deeper or thicker brick would give higher column strength. It is possible that this partially accounts for the fact that the ratio is found to be higher for terra cotta block columns than for brick columns. The tests suggest that the ability of individual pieces to resist transverse strength is an important element in the strength of the completed column. This suggestion may have an important bearing on the advantageous size of the component blocks which may be used in a compression piece where high strength is desired.

Strength of the Columns

The strength of the column is greater than the strength of the mortar cubes in both brick and terra cotta block columns, excepting only the soft brick columns which had brick of low compressive strength. It is evident that the strength of individual brick or blocks and the strength of the mortar both enter into the resistance of the column. The relative effect of the two depends upon the character of the material. It is evident, however, that the better the individual piece the more important it is to have a mortar of high resisting strength.

The results obtained in applying the load eccentrically were found to agree very well with those obtained from ordinary analysis. When the amount of eccentricity in the application of the load is known or may be estimated closely, the ability of the column to resist this action may be calculated quite closely. It is apparent from the results that the calculated resisting stress in the column on the side of maximum compression is higher than that which causes failure in centrally loaded columns. The higher stress developed with eccentric loading is probably due to the influence of the restraint of the less stressed inferior portion. The tests made by applying and releasing a single load a number of times gave failures at loads below those which produced failure in similar columns at a single application of the load. The phenomenon is common in materials of the nature of brick and terra cotta.

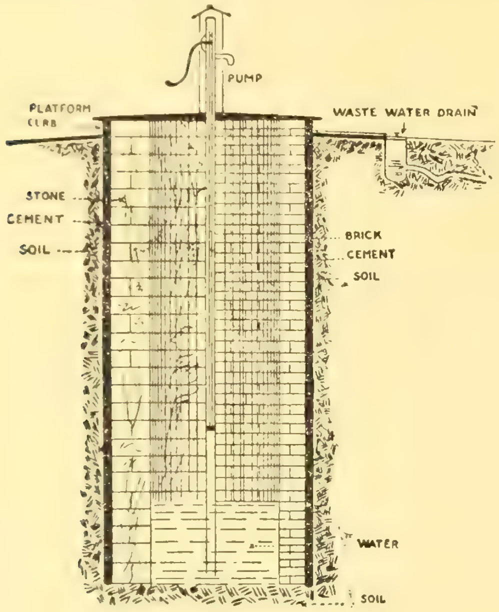
Quality of Workmanship

It is apparent that the quality of workmanship in laying up such columns has an important bearing upon the resisting strength. The work of building columns, however, is not difficult and requires only ordinary care. Full [illegible] and even bearing are important, and the ordinary workman ought to be able to construct columns of high strength. In the tests made of columns intended to represent poor or careless workmanship the decrease in strength was not as much as anticipated. However, it must be understood that careful and trustworthy work is essential and that a few poor joints will materially reduce the strength of the structure. Wherever good material and good workmanship are ensured the strength of masonry of this kind may be utilized with advantage.

Proper Construction of a Well

The accompanying illustration shows the proper construction of a well in brick or stone. Large vitrified drain pipe with cemented joints would answer equally well when there is an abundant supply of water. But in those cases where the supply of water is less, a larger area is needed, and a stone or brick well is necessary.

Reference to the illustration will show that every endeavor is made to prevent surface water entering the well. The walls are impervious, and the earth or clay is well rammed against the outer wall. The curb is carried well above the surface of the ground. The waste water is conducted by means of a catch basin, trap and drain away from the well and the well opening is properly covered. All water entering such a well must percolate through a considerable depth of soil, and undergo purification by means of the aggregations of living bacteria in the soil spaces, a casting out of devils by means of Beelzebub, the prince of devils.



Plan of Model Well.

Quebec Section N.T.R. Nearing Completion

Mr. A. E. Doucet, resident district engineer for the National Transcontinental, states that the Quebec district of that railway, known as district "B," will be completed by 1912. The complete mileage of this district is 507 miles, extending from the New Brunswick boundary to 303 miles west of Quebec.

Up to date, with the exception of a few breaks, amounting to the bridge on the Jacques Cartier river, and the yards at Caprouge, rail is laid on the north shore west of the Quebec bridge for 188 miles, to the crossing of the St. Maurice river, and about eight miles east of Way Montachene as far as the Hudson Bay post.

The grading is partially complete for 72 miles west of that, and at the end of this season rail is expected to be laid to the crossing of the Gatineau river, about 235 miles from Quebec, leaving about 60 miles in the district west not yet under construction.

On the south shore of the St. Lawrence rail is laid on a good distance. All the grading has been done, and it only requires filling, and the completion of the bridges and viaducts. The average number of men employed daily is 3,700, and the number is being constantly increased.

Reinforced Concrete Piers

Two reinforced concrete piers were recently built in the harbor of Genoa, Italy, in order to carry a light steel bridge of a grain unloading plant. Each reinforced pier, according to "Engineering," London, is 35 feet high and carries a masonry pier to 19 feet high above water level. The piers are 13 feet 11 inches by 17 feet 3 inches in plan and have a working chamber at the bottom, 5 feet 11 inches high, so that they could be sunk by the pneumatic process. The walls vary in thickness with the depth, the maximum being 7-inch. They transfer the pressure on them to vertical beams which, in turn, are stayed by horizontal reinforced concrete struts running to the beams in the opposite wall. Beam and strut sizes are also reduced with the diminishing water pressure. The walls of the working chamber are of solid concrete, reinforced in both faces, 23.6-inch thick at the top and 7-inch at the bottom, where they are shod with a cutting edge of channels and angles. This cutting edge is secured to the concrete by straps placed at intervals, looped over the reinforcing bars in the concrete and rivetted to the upturned legs of the channel. The piers were built on shore, floated to place and then sunk.

Mr. A. O. Graydon, who has been city engineer of London, Ont., for the past 19 years, has resigned, owing to ill health. It is probable that Mr. Graydon will be retained as consulting engineer to the city.

Chief Justice Sir William Meredith has been appointed by the Ontario Government a single Provincial Commissioner to prepare new legislation for the compensation of workmen for injuries sustained during employment.

The preliminary report of the three engineers, Messrs. Schreiber, Kelliher and Grant, who, as a board of arbitration, have been considering the claims of over-classification in the building of the National Transcontinental Railway, shows that on contracts aggregating about $15,000,000 on section "F" the total amount of over-classification is only about $200,000. On section "E" the over-classification amounts to less than $25,000.

Mr. W. R. Sweeney, who has been acting as contracting agent for the Civic Electric Department at Toronto, has been appointed general manager of that department by the Board of Control at a salary of $2,700 a year. Mr. Sweeney graduated from the Maryland Technical School, Baltimore, in 1887. For some time after graduation he was engaged in electrical construction work and later became connected with the engineering firm of Stone & Webster, Boston, which he left to enter the electrical department at Toronto.

The contract has been signed for the construction of the Nova Scotia Eastern Railway from Dartmouth, N.S., to Guysboro, N.S. The signatories to the contract were Hon. C. P. Chisholm, Commissioner of Public Works and Mines, representing the Provincial Government; J. B. Bartram, Toronto, and G. E. Boak, Halifax. The company, which is backed by London capitalists, receives a total subsidy of $12,800 a mile and agrees to start construction by September 1st next. The limit for completion is September 1st, 1913.

The Construction of Broken Stone Roads

Practical Directions of Interest to Road Superintendents, Engineers and others—Approximate Cost of Ordinary Stone Road—Tools and Machinery

By Hiram Donkin, C.E., Halifax, N.S.

In addition to shovels, picks and spades and other ordinary implements of construction, a four or six horse road plough, an ordinary road machine or grader and several wheel scrapers are usually needed. Several wagons with dump boards for hauling stone are essential. Bottom dump or spreading wagons will save money if such construction is to be undertaken, but are not a necessity. Water plays a great part in making the stone cement together, so a watering cart or sprinkler should be secured. A roller of from five to ten tons is indispensable. Fairly satisfactory roads have been built with heavy horse rollers, but so much better and quicker work can be done with a steam roller that it is safe to say that nothing else should be used. A ten-ton steam roller can be bought at prices ranging from $2,000 to $2,750 according to the make. As a steam roller will do several times the work of a horse roller in a day, it is evident that the steam roller is much the cheaper. If it is decided to use local stone and there is no crusher available to do the work, it will also be necessary to buy a crushing outfit. A good, portable outfit, consisting of a crusher, engine, screens and bins, will cost from $1,500 to $3,000 complete, according to capacity.

Stone—The principal qualities needed in stone for road purposes are hardness, toughness and cementing value. The trap rocks, including diabases, diorites and a few other igneous rocks are the best materials. The harder limestones, some granites and felsites are also excellent. Sandstone, slates and quartzites have little value as surfacing materials, but when sound and moderately hard, they can be used for the bottom or first course.

Width of Country Roads—This question is a much discussed one. In some places 12 feet has been adopted as the least width of the stone surface, some 14 feet and some 10—the width required depends upon the amount of travel. For the majority of roads nine feet of stone (or gravel) with a graded width of 20 or 24 feet between ditches is ample. Approaching towns and cities and on other much travelled roads 12, 14 or 16 feet of stone may sometimes be needed. Anything beyond this width is out of the realm of country roads and becomes a street. A 9-foot road will not, it is true, allow two teams to pass on the stone surface, but it is comparatively seldom that two heavily loaded teams have to pass, and when they do the shoulders offer a surface harder and firmer than the usual country road. As it is estimated that a farmer turns out not over once a mile on the average, it seems better to first get length and afterwards width when the need arises, rather than build the extra width to turn out when an occasional meeting occurs. In other words, with a given amount of money, it is better to build a mile and a half of road 9 feet wide than to build one mile 16 feet wide.

Grading—Cuts should be made at least 20 feet wide at the bottom and fills 22 feet on top. On any roads to be macadamized, the hills should be reduced to a grade of not over 6 per cent. (6 feet of vertical rise in every 100 feet of horizontal distance), unless there are insurmountable physical or financial difficulties. It is almost impossible to maintain a good road on grades steeper than this, and the expense of maintaining them is much more than the interest on the cost of cutting would be. Heavy grades can often be lessened by re-locating the old road and the required grade secured, even with the land damages added to the grading cost, at less expense than the cutting down of the original hill. Bumps and hollows should be smoothed and even, regular grades secured.

Grading Construction—No work of importance should be undertaken without securing an engineer or surveyor to make a survey and to take levels and plan the road carefully. Such services cost little in comparison to the total cost of the work, and will result in the saving of many times their cost in improved grades and lines, and in getting the material in the proper place at first, rather than moving it several times before the desired grade is secured.

Culverts and Drainage—Culverts and bridges should be put in or repaired, so that all water will be quickly and effectively taken care of. It should be remembered in constructing these that the road is to be a permanent one, and only the best material and construction should be secured. Reinforced concrete construction is recommended for all bridges up to 30-foot span. They are indestructible and require no plank floor renewals as do wooden bridges, and no painting, as do steel structures.

Tile sub-drains should be put in where the sub-grade is continually wet from springs or ground water, and should be placed not less than three feet below the surface. The tile should be 3 inches to 8 inches in size and should be placed under the ditch on the side of the road from which the seepage comes, or under the centre of the road in cuts and flat places. It is well to fill in around the pipe and for several inches above it with the largest size of stone used in building the road, as this increases the capacity of the drain and prevents earth from getting into the joints. The open end of the tile should be covered with a small mesh wire screen. A trench of the same depth filled with 4-inch stones or brick bats will serve practically the same purpose. A fall of 6 inches in each 100 feet should be secured in the side ditches whenever possible. Tiling is much cheaper than the method usually employed, of filling in with large stones until the bottom is reached, or of putting in a foundation of large flag stones, as is often done, and it is even more effective.

Sub-Grade—The sub-grade is the roadbed on which the stone is to be placed. Most of the dirt to be moved in making the trench for the broken stone can be plowed and thrown out with an ordinary road grader at small expense. Some of the trimming must be done by hand, but the greater part can be moved successfully by an ordinarily expert road machine operator. Shoulders should be made two or three inches higher than their final shape when they are made by filling, to allow for their being compacted by the roller. Care should be taken not to deposit soggy dirt from the ditches, sod, etc., on the sub-grade in the grading work. Only the best material at hand should be used and with a little care in this respect, much better results can be obtained with no additional cost.

When the roadbed has been brought to shape, the trench should be thoroughly rolled until it is hard and firm. Hollows and humps should be removed by cutting or filling and the whole sub-grade made hard, smooth or even, and of the same cross slope as that of the finished roadbed. A cross slope of not less than one inch to the foot is the proper amount. This slope drains water off quickly and preserves the crown of the road longer than a smaller slope. Remember that the sub-grade must be shaped and rolled property. Bumps and hollows in the sub-grade will clearly show up in each succeeding course. After the trench is made always cut drains through the shoulders to the side ditches in all wet places before leaving the work. This will save many day's work in laying stones. It will keep the sub-grade dry when otherwise it would be flooded at every downpour of rain. These drains should be filled with 3-inch stone when the stone for the first course is spread. They can serve as permanent drains for the stone roadbed if water by any chance should get into it.

First Course Construction

When the sub-grade has been thoroughly rolled the first course of stone is spread. This ordinarily consists of broken stone from 2 inches to 3 inches, but some little latitude may safely be allowed, say from 2 inches to 3½ inches—stone larger than 3½ inches in any dimension, should be broken with a napping hammer. Stone for the first course need not be of especial hardness or toughness—ordinary good hard stone of any kind may be used. The thickness of this stone (like every feature of the road) varies with local conditions. On good soil, 4 inches loose is sufficient, but in some cases 5 inches and even 6 inches should be used. A course of over 6 inches cannot be thoroughly rolled and should never be used. Twelve inches of stone loose in the two courses is all that is ever necessary, that is, two courses of 6 inches each, without the dust. The present tendency is to attempt to make up for poor methods of construction by using a foot or even more of stone or gravel, when a well-made six-inch road would be cheaper, better, and more lasting.

Stone for any course should not be dumped on the place it is to be used. If spreader wagons are not used, the stone should either be dumped and raked or shovelled into place, or spread with shovels from the wagons. This may seem an unnecessary nicety, but if the stone is bodily dumped by the wagon load and raked down, the centre of the pile is more solid than the rest of the stone, and rolling simply serves to accentuate the unevenness. Roads built in this way show up bumps where each separate load of stone was dumped. If pockets of the fine stone occur they should be shovelled out and replaced by stone of the proper size, as the fine stone will grind up faster under the wheels and a hollow will be formed in the road. Both courses of stone should be spread with blocks cut to the depth of loose stone desired. One block should be placed in the centre and one at each side and the stone carefully levelled to the top of these. When 100 feet or more of stone is spread and carefully shaped, rolling should commence. Always commence to roll at the sides and when both sides are firm, work gradually towards the centre and finally roll on the centre when all danger of spreading the stone is past. If this is not done, the roller will mash the stone out flat and spoil the crown. When the stone is thoroughly rolled, one should be able to walk over it without causing much movement of stone, except just under the feet. Experience will soon teach the builder as to how much to roll any particular kind of stone used, and when to stop. Do not roll too much. At a certain point the stone ceases to consolidate and further rolling simply causes the stone to become rounded and poor for road purposes. With a sandy sub-grade, it is usual to spread an inch or two of earth, gravel or straw before placing the stone, in order to prevent waste of stone by pushing it down into the sand.

Second Course

The first course having been thoroughly rolled, the second course should be spread the same width as the first. This course should consist of the best material economically available; which means the material that for a fixed sum will produce the greatest road value, not for a year, but for twenty years or more. For instance, a sandstone road may be locally made for $1 per cubic yard on the road. A good trap rock may in many cases be brought in by rail and put on the road for $1.50 per yard. The latter would be económically best, as it would be a road when the sandstone road had long since been washed into the gutters and blown away. In general, the limestones are best for surfacing roads with small or moderate travel, and granite or trap rocks, for the heavily travelled roads.

The second course should consist of stone broken in size from ¾-inch to 2-inch, and be screened as closely as possible to these sizes. It should be spread with blocks to a depth of not less than 3 inches, nor more than 6 inches in any case, varying with the hardness of the stone, etc., and the total depth of road desired. This course must be spread with the same care as the first course, and rolled in the same manner. In commencing to roll the second course, the outside wheel of the roller should rest partly on the stone and partly on the shoulder, so as to keep a uniform slope to both, and to pack the shoulders in order to keep the stone fro mspreading.

Whenever possible, the shoulders should be rolled for a distance of at least two feet from the stone at this period of the road's progress. Roll to the centre as before, until the stone is firmly in place, so that a gentle kick will scarcely dislodge a stone, and the whole is firm and even. The road is then ready for the third or binder course. Before spreading this, all depressions or bumps in the stone should be levelled or filled with additional stone of the same size as the rest of the course, all wheel tracks smoothed out and the roller run over such places again, so that the surface of the stone is hard and smooth, and of even cross and longitudinal slope.

Third Course

The third or binder course should consist of stone screenings varying from dust to ¾-inch in size. It is usual to have this of the same material as the second course, though small gravel and sand can be used as binder for some rocks, with good results. With a granite second course it is better to use limestone screenings, as granite dust has small cementing power. The dust should be spread with shovels from the wagons or from piles along the road side, but never dumped directly on the stone surface. It should be applied with a quick, jerky motion, so that a shovelful goes over a large area, until the second course of stone is entirely hidden and there is a uniform coat of say ¼-inch over the whole surface of the stone. Then the road should be firmly rolled as before until the dust is well pressed into the space between the stone and a coating left on the surface. Bare places, as they show up, should be covered with more screenings until the whole is firm and hard and none of the stone in the second course show.

The road should then be thoroughly sprinkled with water from an ordinary street sprinkler, to wash the screenings into the voids of the stone, and when it flushes or rises to the surface it shows that the voids in the stone have been properly filled. A road is properly flushed when the steam roller following closely behind the sprinkler has a wave of water continually going before the wheels. This flushing may cause the dust to settle so that bare places show again. Cover these with more screenings and wet and roll until the whole is firm and hard, and uniformly covered with a thin coat of dust. The great mistake usually made is in applying too much dust—enough to cover the stone at all stages of the finishing should be used and no more. Too much dust soon ruts, travel becomes concentrated in these ruts and water standing in them soon causes a soft place in the stone below and the ultimate destruction of what would have been an excellent road.

Trimming

When the road is about finished as above, a road machine with the blade set to the proper slope, should be carefully run over the shoulders and all surplus dirt removed until the road has as nearly as possible the desired shape, and the slope from the centre of the road to the ditches is smooth and uniform, so that water falling on any part of the road surface, is quickly carried to the ditches. Bumps and depressions can be levelled with a road drag by anyone expert in road dragging. Probably some picking and shovelling will be needed, but with practice much of this can be done with the road machine and earth drag and a large part of the expense of trimming saved.

The roller should then be run as closely as possible to the ditches or edge of the shoulders, so that the whole is made hard and firm and offers an opportunity to teams to turn out wherever necessary. Before leaving a road as completed, go over it carefully and see that all ditches, culverts and underdrains, etc., are clean and open, and that slopes are in clean and even condition. In cuts, the slope should be made not steeper than one foot horizontal to one foot vertical, and on fills not steeper than one and a half feet horizontal to one fot vertical.

Summary

It is best to secure a heavy roller.

The road should be carefully graded and drained.

The sub-grade should be carefully shaped and rolled.

The first course should consist of from four to six inches loose of any sound broken stone from 2 inches to 3½ inches in size.

Second course should consist of three to six inches of good road metal, of ¾-inch to 2-inch in size.

Third course should consist of stone screenings, or gravel and sand, varying in size from dust to ¾-inch.

Roll all courses thoroughly, commencing at the sides and working to the centre.

Bumps in any course or in the sub-grade should be removed and all depressions filled with material of the same size and kind as that being rolled.

Flush with water until mud comes to the surface.

Clean all ditches, culverts, etc., and leave the slopes and sides of the road in clean, unobstructed condition.

Do not attempt to make a good road with unscreened material, that is, with stone of all sizes unmixed.

Do not use clay for a binder; it makes a muddy surface in wet weather and a dusty road in dry weather, and, above all, makes weak spots in the road which will cause the road to wear unevenly

Approximate Cost of Ordinary Stone Road

	Cu. yards.
Stone for 1 mile, 9 feet wide, 6 inches thick	1,174
Screenings for 1 mile, 9 feet wide, 1¼ inches thick	220
Total stone	1,394
Add one-fifth for tons	279
Tons of limestones required	1,673
Stone, 1,673 tons at 60c..........................	$1,003.80
Freight, 1,673 tons at 25c.......................	418.25
Unloading, 1,673 tons at 5c......................	83.65
Loading and unloading teams, 1,673 tons at 5c...	83.65
Hauling one mile, 1,673 tons at 20c............	334.60
Laying macadam, 5,280 sq. yds. at 20c..........	1,056.00
Total cost	$2,979.95

An ordinary stone road will, therefore, cost about $2,979.95, exclusive of grading or culvert work. Of course, local circumstances may raise or lower these rough figures, but they should come within 10 per cent. of the actual cost as far as the labor items are concerned, and can be used with confidence as an approximate estimate.

If it is decided to set up a local crusher it can be safely said that stone can be quarried and crushed for less than 60c. per ton, and from this it will go as high as $1. Do not set up a crusher where loose field stone has to be collected by wagons and hauled to the crusher unless stone cannot be gotten for less than $1 per ton delivered; crushed stone will cost that or more if collected in that way. The most satisfactory way to crush stone is from a quarry with a good breast, or from stone piles. Moving the crusher plant, unless provided with portable bins, will cost about $100 each time, and it will not often pay to set up for less than 1,000 cubic yards at a place.

The above will give each community some idea of what modern stone roads will cost them per mile, and there are very few communities in which there is not a mile or two of road which should be improved in accordance with the above method. The cost of the material on the road is the same per mile, whether well or poorly built, and this cost is so great a percentage of the whole cost, that no section can afford to build roads in poor fashion, when well-made stone roads that last, can be built at a cost of not more than $1,000 per mile above that of the old methods. The well-made road will probably last for 50 years if properly cared for and be always satisfactory. The built-as-you-please roads will last probably one-third as long and never be satisfactory.

Mr. W. Owen, C.E., of London, England, representing a British syndicate, has concluded arrangements for the establishment of a large steel plant at Vancouver, B.C. It is stated that the works will cost $15,000,000, will give employment to 5,000 men, and will be commenced next fall. Mr. Owen has now returned to England in connection with the registration of the company, which will probably take place at the end of next month.

At a luncheon given recently to Mr. Albert Vickers, chairman of the English firm of Vickers Sons & Maxim, by the Montreal Harbor Commissioners, the guest of honor spoke optimistically concerning the prospects of his firm becoming shortly "an integral part of the marine and industrial development of Canada." The proposed works will be built in conjunction with the new dry dock planned by the Montreal Harbor Commissioners.

At a meeting of the Toronto Board of Control last week, a protest was made against a contract being awarded for American treated blocks for the Yonge street pavement, south of King, in preference to Canadian blocks. It was pointed out that the Canadian pavement would cost only $9,500, against $11,400, the price of the successful bid. City Engineer Rust said that he was not prepared to recommend the Canadian blocks. The matter was referred to council.

Construction work is booming at Outremont, Que. A year ago the building permits issued by Inspector Reid showed an estimate of $400,000 for the opening three months of the season, and the year's work ran to close on the million dollar mark. For the quarter closing with June of the present year the valuation of new buildings authorized was about $800,000 and there are already in view a number of buildings that in course of the next few weeks will give the figures a further boost, so that 1910 promises to be a banner year.

The marriage of Miss Adeline Susanna Peddar, of Stowmarket, England, to Mr. Phillip John Turner, Fellow of the Royal Institute of British Architects, was solemnized June 14th at St. Martin's Church, Montreal. Mr. and Mrs. Turner are spending their honeymoon at Lake Memphremagog. On their return they will reside in Montreal. The "Contract Record" extends heartiest congratulations to one of Montreal's most popular architects.

The name and style of the Dominion Iron & Steel Corporation is being changed to the Canadian Steel Corporation. Mr. J. H. Plummer recently announced that they had issued considerably over $31,000,000 worth of common stock of the new corporation for shares in the Steel & Coal Company. They now hold over $18,000,000 worth of Steel stock, and over $12,000,000 of Coal stock

The Montreal Herald Disaster

No Blame Assigned at Investigation Interesting Evidence Given by Architects and Engineers

The coroner's jury, appointed to investigate the collapse of the Herald Building at Montreal, has found that no one is responsible for the calamity. In the verdict is contained a suggestion that a by-law be passed to compel the inspection of overhead tanks every three months, but the blame is not located.

One or two interesting points were brought out at the renewed inquiry:

Building Inspector Chausse stated that in 1905 a permit had been granted, but that he knew nothing about the presence of the tank upon the building until after the accident. He said that permits would be granted for the erection of tanks upon old walls if they came up to the requirements of the city by-law. Many such tanks had been so erected, some on walls, some on a separate base and some on steel work. The inspection before the granting of a permit for such structures consisted in examining the ground, the foundations, the walls and the quality of material employed in their construction. Permits had been granted for such tanks to be placed upon 12-inch walls. Had he been consulted before the erection of the tank he would probably have granted the permit in view of the existence of the 12-inch walls and the concrete piers. He had examined the building since the collapse and had found the strip of wood which ran the whole length of the building, front to back, between the brick wall on either floor. This he was of the opinion did not tend to weaken it. There might be a shrinking soon after its construction, but its presence was a safeguard, as it would arrest the cracking of the wall between each floor.

In his judgment one of the floors had given way, disturbed the equilibrium of the centre wall and caused one floor to come down upon the others. The weakest portion of the floor was at the back upon the western side on the fourth floor, where the steel floor had been placed beneath the metal tank. The presence of an opening to the stairway also served to weaken it.

Mr. Chausse suggested a possible remedy against such catastrophes by having a specially built brick tower erected with the tank on top. He was not partial to the use of steel.

Mr. Chausse further said that he had been accompanied by Mr. Guyon, Inspector of Factories, and that in his report to the commissioners he had stated that in his opinion some shock or explosion caused the equilibrium of the centre wall to be disturbed. In his deduction that the back wall had been the weakest, he said he had based his assumption on the architect's plans, as when he visited the scene the rear wall and floors were a mass of debris.

Since the catastrophe he had received a few letters from owners to go and inspect their buildings, but previous to the accident he had not inspected the Herald Building. When questioned as to the cost of erecting a tank upon a new wall as against one upon a steel structure, he stated there would be a slight saving in the use of the latter.

He had found the beams, which were placed under the metal pot, intact in portions of the flooring. He was not able to surmise how much weight the building was designed to carry. The general practice was for the owners or the contractors to obtain permits. The penalty for not doing so was a fine of $40 or two months' imprisonment. In his opinion the effect of the 60 tons of weight distributed by the tank did not have any effect upon the stability of the wall.

Mr. Louis Guyon, factory inspector, testified that he knew the Herald Building well, and had often visited it when the Bishop Engraving & Lithographing Company, the previous tenants, were in possession. His inspection dealt more particularly with regard to the safety of the employees against accidents by machinery, stairway exits and fire escapes. If, however, he saw what he thought was too heavy a load on any floor he would order its removal or distribution, and where there was pronounced vibration he would advise regarding the shafting. During 1906-7 he had called at the Herald regarding the fire escapes, and he was also aware of the presence of the water tank, though he had no occasion to inspect it.

In his opinion the floors gave way and brought down the centre brick wall as one floor crashed upon the others. He did not think the tank caused the collapse by reason of its location in the southwest corner, two hours after the fire. It did not strike him that there was too much machinery, because the Bishop Company had used heavier machinery on the top floor than that utilized by the Herald. This machinery employed by the former tenants was weightier than the contents of the stereotyping room.

Mr. Walter J. Francis, civil engineer, Commercial Union Building, said that in his opinion the collapse was due to faulty floor construction which no one could foresee. Three days after the collapse he had examined what remained of the building and found that the floors were in part supported by two rows of cast iron pillars and the centre brick wall. Transverse beams ran from these columns with longitudinal beams front to rear.

At the top of each pillar was a floral capital of rough casting, and in the beam resting on this cap a square plate, cast iron, also rough. Upon this plate was a ten-inch cast iron rod which supported a like square place which carried the pillar on the floor above—a very "tipply" construction which he likened to an irregularly built column of children's toy blocks. Any fracture in this hidden detail might cause the collapse of the floors and carry down the centre wall.

Regarding the weight of the tank on the centre wall, the greatest strain would be at the ground floor, where, in addition to the bulk of the tank, the proportionate strain of each floor had to be borne as well. This base portion of the wall was still standing when he went over the ruins.

Mr. J. S. Archibald, architect, said that he visited the building in 1905 and had inspected the wall only in regard to the weight of the tank. In a general way in 1905, 1906 and 1907 he had been consulted regarding the floors. In the stereotyping room he had noted a sagging in the centre, and marked vibration from the machinery. In 1906 he had recommended the placing of steel beams on the west side of the second floor under a press. He had also suggested the removal of the shafting in the stereotyping room, and in 1905 he had recommended a row of piers on the second floor. In 1906, too, he had recommended the removal of all machinery from the rear of the building to the front on the east side. In the same year he had been consulted regarding the construction of a pit in the basement to accommodate a new press, and that was his last visit. In every instance he had merely given advice, and not called to see whether it had been acted upon.

Visiting the scene after the fire, he found fully two-fifths of the tank intact, and in his opinion it must have plunged from roof to basement without obstruction of any kind.

Montreal Contractors Standing Firm

Peter Lyall, of Peter Lyall & Sons, Montreal, is not very much concerned over the strike of the union bricklayers and stonemasons in that city. He states that the work of his firm is going on with very little interruption. It is not expected that the master builders will concede the demands made by the men as the former have been anticipating the present movement for some time and have been prepared to make just such a stand as they did in the case of the bricklayers' strike. On the other hand the men are well backed by funds and state their intention of fighting to a finish. It is admitted by the union men that the strike operations are largely aimed at Messrs. Peter Lyall & Sons and Messrs. Byers & Anglin, both of whom have large contracts in Montreal and throughout Canada.

The proposition of the men is to secure closed shop, and a written contract with the master builders, for three years, covering a rate for bricklayers of 50 cents an hour for the first year, 55 cents an hour for the second, and 60 cents an hour for the third year, with proportionate increases for the stonemasons.

Paving Contractors Suing City of Montreal

Action is being brought by Messrs. Hyde & Webster, contractors, to restrain the city of Montreal from signing $190,000 of contracts for scoria paving blocks on the ground that discrimination was shown in the acceptance of the tender. The firm tendered for Metropolitan blocks, and contended that they were not placed on an equal footing with others who tendered. In the form of tender handed to them by the city official the number of blocks required was stated as 180,000, while on blanks supplied to other firms the number was three millions. Further, on the day that tenders were called by the city for artificial paving blocks, other tenders were also called for the placing of scoria. This, the petitioners contend, shows that the Board of Control had already decided to accept scoria apart from the merits and prices of other blocks to be submitted.

The reply filed on behalf of the city states that the figures quoted in the form of tender supplied to Hyde & Webster was a clerical error. With regard to the tenders for placing blocks, scoria had been mentioned to indicate the size of the blocks which would be used. City Attorney Lavallee contended that the firm had been guilty of negligence in not presenting their petition before the report of the Board of Control had been passed by the City Council. Although the contract was not formally signed, the city was already in agreement with the contractor for scoria. Were the petition now granted, permanent work on paving would be paralyzed and the city would suffer considerably. The matter is in abeyance.

Hon. Mackenzie King Explains Duties of Royal Commission on Industrial Training

The first meeting of the Royal Commission on Industrial Training and Technical Education was held at Ottawa last week. The Minister of Labor, Hon. Mackenzie King, outlined the scope of the commission, and noted the exceptional opportunities of national usefulness which the work of the commission afforded. There had been many commissions appointed by the Federal and Provincial Governments, but he doubted if there was ever one which gave to its members an opportunity of national service as far-reaching and certain as that afforded the present commission. Owing to the limitations which the constitution imposed, the scope of the commission was necessarily confined to that of gathering information, which would subsequently be placed at the disposal of the several provinces. It was important, he said, for the commission to bear in mind that education as such was a subject assigned to the provinces by the British North America Act, and that the Federal Government did not intend in the appointment of the commission to in any way encroach upon the jurisdiction of the provinces. As a matter of fact, the consent of the Premiers of the several provinces to the establishment of the commission had been obtained before its appointment was decided upon. Mr. King hoped the commission would make it a point when visiting the several provinces to call first of all upon the Premiers of the provinces and ascertain from them any points which in their opinion it was especially desirable to note.

The Minister suggested that before travelling abroad it would be desirable for the commission to make an industrial survey of the Dominion by visiting the several provinces and ascertaining the nature and extent of the several industries and trades and their relative importance. Coincident with this, it was desirable that the commission should ascertain all that was being done at the present time, through Governmental or private agencies, in the way of promoting efficiency by industrial training and technical education. Having in this way familiarized themselves with the industrial methods and industrial equipment of the Dominion, they might then visit other countries, the United States, Great Britain, France and Germany, and ascertain the methods by which these several countries were promoting industrial efficiency. It was important that those engaged in the work of technical education, the boards of trade, factory inspectors, employers' associations, trades unions and other organizations, should be given every opportunity of having their views fully presented. The Government would do all in its power to facilitate the commission's work.

Personal News and Notes

Mr. R. E. Carter, Toronto, having disposed of his interests in the Hamilton Brick Company, Limited, has resigned his position as president of the board of directors of that company.

The judges at the aviation meet now being held in Toronto include Mr. T. C. Irving, Jr., Dr. Galbraith, City Engineer Rust and Mr. R. P. Fairbairn, Deputy Minister of Public Works.

A contractor named W. J. Taylor, of Woodstock, Ont., had a narrow escape from death last week by falling 40 feet from a scaffold and alighting on a pile of bricks. He was badly cut and bruised but not seriously injured.

Mr. L. A. Vallee, Chief Engineer of the Public Works Department of the Province of Quebec, has also been appointed engineer of the Public Utilities Commission. Mr. Vallee's connection with the Department extends over more than 30 years.

The new building inspector at Edmonton is Mr. Catterelle, who was trained at Mason's College, Birmingham, and later identified with S. Pearson's, Limited, one of the largest British contracting firms, and also with the Hennibique Reinforced Cement Company.

A deputation from the Engineers' Club of Toronto waited upon Hon. W. J. Hanna last week to ask that the club be granted supplementary letters patent. Dean Galbraith and City Engineer Macallum of Hamilton presented the case of the engineers. The matter will be taken up with the Provincial Secretary's Department.

Mr. W. Chase Thomson, M.Can.Soc.C.E., assistant engineer of the Dominion Bridge Company, Montreal, resigned his position at the end of June and has assumed charge of the Canadian office of the Cleveland Bridge & Engineering Company, Limited, of Darlington, Eng. His office is in the Canadian Express Building, Montreal.

Mr. H. Y. Parker has been appointed city engineer of Cranbrook, B.C. City Engineer Parker was born in New York State and came to Canada six years ago, taking up residence at Calgary, Alta., where he occupied the position of resident C.P.R. engineer. After spending a year at that point, Mr. Parker was transferred to Cranbrook, where he acted in a similar capacity for 18 months. He left the C.P.R. employ to engage in a general engineering business and, prior to his present appointment, executed various commissions for the city of Cranbrook to general satisfaction.

An old time civil engineer of British Columbia passed away recently in the person of Mr. J. W. Balmain, of North Vancouver. Mr. Balmain, who was 71 years of age, was a native of Scotland and obtained his engineering training in the old country. Early in life he went to India, where he supervised some important government works. Upon the completion of these projects he crossed the Pacific to Vancouver and entered the service of the C.P.R. under Mr. H. J. Cambie. Later he entered the employ of the city of Vancouver. A few years ago he served as engineer for North Vancouver. For several years prior to his death he had been engaged in private practice in which he enjoyed an extensive connection.

The Alexander Milburn Company, of Baltimore, Md., manufacturers of portable acetylene lights, have furnished us with an interesting catalogue of their products. During the ten years that the company have been manufacturing the Milburn light they have sold in Europe and America over

60,000 lights, exceeding in aggregate 60,000,000 candle power. For use in building and contracting work of all kinds these lights appear to us to represent the acme of economy and satisfaction.

J. C. Kennedy, C. E., Vancouver, B. C.

Vancouver, B.C., newspapers announce that Mr. James C. Kennedy, C.E., has opened an office for private practice in that progressive city, and also make reference in eulogistic terms to the qualities and practical experience which commend Mr. Kennedy to the confidence of the public.

Mr. Kennedy, who is a member of the Canadian Society of Civil Engineers, began his professional carrer in the "seventies," on the construction of the Ottawa water works, under that eminent veteran, Mr. Thos. C. Keefer, C.E., then chief engineer of the work. As the undertaking neared completion, Mr. Kennedy was engaged by the chief engineer of the Toronto water works, Mr. P. A. Peterson, C.E., who was also chief engineer of Government railways for the Province of Quebec, to proceed to Toronto as assistant engineer, and to assume charge of the re-laying of some two miles of 4-foot conduit, a work that had previously proved troublesome and that had provoked considerable controversy between the city and the contractors who had laid the pipe.

After the successful completion of the Toronto work, Mr. Kennedy was re-engaged by the Ottawa Water Commissioners and sent to Philadelphia, Pa., entrusted with the supervision of waterworks contracts under execution by a manufacturing firm of that city. Since that time he has directed and designed many important works, both for municipalities and for private corporations and in various localities between the Atlantic and the Pacific. His latest engagement was with the Stave Lake and the Western Canada Power Companies, and covered a period of over three and a half years as engineer in charge of the construction of the well known 40,000 horse-power hydraulic development at Stave Falls, B.C. In the last named connection Mr. Kennedy has established an enviable reputation for professional ability.

Associated with Mr. Kennedy will be his two sons, Mr. H. C. Kennedy, C.E., and Mr. W. A. Kennedy, B.Sc. Both are graduates of McGill, and each has had the advantages of exceptional practical training in various parts of the Dominion.

While wire cloth has the advantage over perforated metal for sieving purposes, in many cases the rough or uneven surface of the former has been a great disadvantage. This has been overcome by passing the cloth between heavy rolls to flatten the crowns of the wire. The B. Greening Wire Company, Limited, Hamilton, Ont., have always done more or less of this work, and lately finding the demand for same very largely increased, they installed rolls to take care of the demand for medium weight screens. This proved such a success that the firm was encouraged to put in heavier rolls. These rolls are now installed, and are without doubt the heaviest rolls to be found in any wire cloth plant on the continent. The installation of these rolls marks the completion of a wire weaving plant that is equal to that of any concern in the world making the same class of work.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer
Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1040

The Best HOIST in Canada
Note Well the Exclusive Features
The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.
The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.
Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.
Marsh & Henthorn, Limited - Belleville, Ont.
Sales Agents: MUSSENS LIMITED, Montreal

Phone Main 6805—6806
The
Roofers Supply Co.
Limited
Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings
Corrugated Galvanized Sheets
GET OUR PRICES
Bay and Lake Sts. Toronto
Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

Builders' and Contractors' Supplies
Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime.
FIRE BRICK IVORY CEMENT PLASTER
—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.
The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

Specify in the Contract

"Metallic"

Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

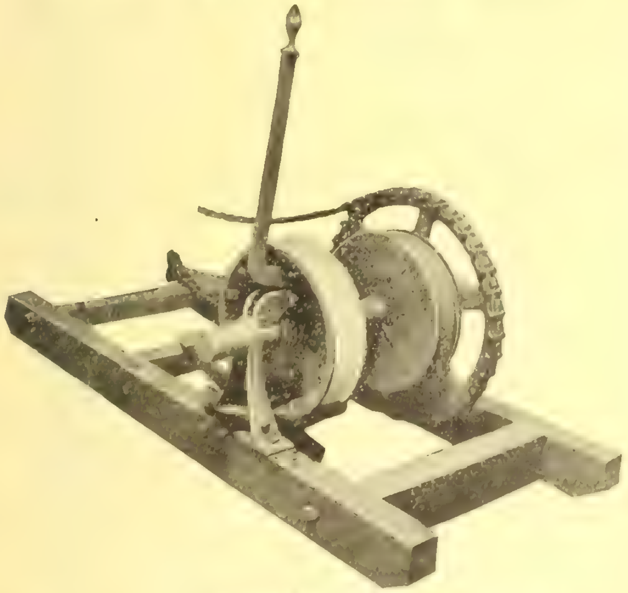
The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1955

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

DOMINION BRIDGE CO.

LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

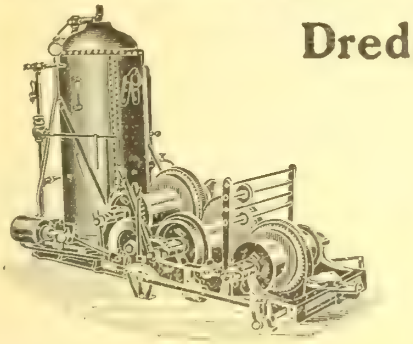
Niagara Railway Arch.

Offices—

New York N.Y. -	71 Broadway
Baltimore, Md. - -	Continental Trust Bldg
Boston, Mass. - - -	70 Kilby Street
Chicago, Ill. - - -	Western Union Building
Mexico City, Mex. -	Edificio de "La Mutua"
Philadelphia, Pa. - -	Franklin Bank Building
San Francisco, Cal. - -	1505 Chronicle Building
St. Louis, Mo. - -	Commonwealth Trust Building
London, England - -	110 Cannon Street
Steelton, Penna. - -	At Works

M. Beatty & Sons, Limited

Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Steel Bridge Contractors
Structural Steel Contractors
SPECIFICATIONS SOLICITED
Corbet Foundry & Machine Co., Owen Sound, Ont.

Steel and Wood **TANKS**

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

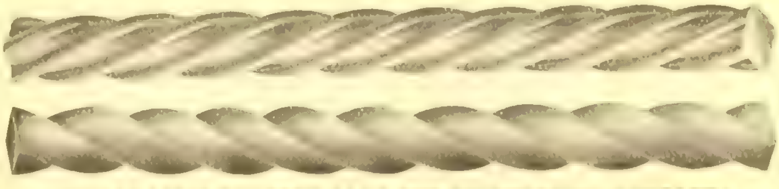
Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N.Y. Suburb of Buffalo, N.Y.

Toronto Office
117 Home Life Building

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

For flat or water rubbed effects

Flattine Finishes

are generally specified and recommended by most

Prominent Architects

Flattine Cabinet Finish
Flattine Floor Finish

They work with great freedom and have unequalled covering capacity. **Flattine** is the only perfect flat finish. It produces a full, dull flat effect—dries hard over night and is very tough and durable. Two coats produce a rubbed effect finish on new work; **only one** coat being required for old work.

Write for our **nickel steel bound book** entitled "Architectural Finishes and Stains." It actually demonstrates the superiority of Elastica and Flattine Finishes—also Kleartone Stains (acid and oil).

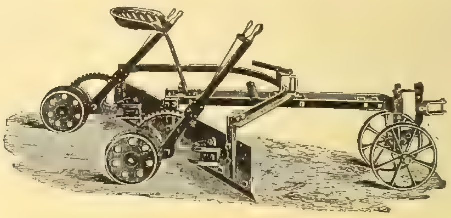
All Packages are full Imperial Measure

INTERNATIONAL VARNISH CO.
Limited
Toronto Winnipeg

2509

Climax Handy Reversible Road Grader

Giving Satisfaction in all Localities



The following is an extract from a letter received from A. T. Stephenson, Commissioner of Red Deer:—

Red Deer, Alta.
April 15th, 1910

"I enclose herewith cheque to cover grader. I may say that we have used the machine for several days on our streets and it is the machine we have long needed for keeping the roads and ditches in repair. We are well pleased with it and I am sure that when some of the councillors for Local Improvement Districts see it work they will get some. We use a plow on the side of the road and throw up three or four furrows, then use the machine and grade to the centre, afterwards going over and picking up loose stones. We use the town team and they handle it without difficulty."

For Prices Apply to

Climax Road Machine Co.
Hamilton, Ont.

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

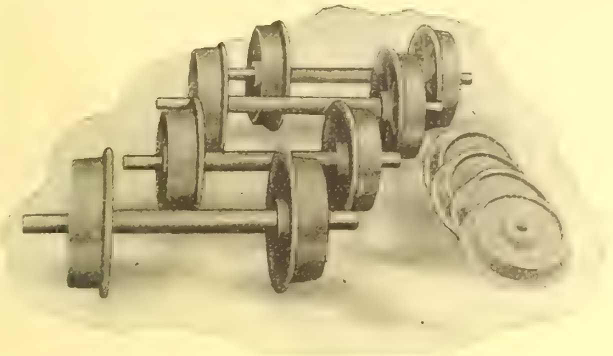
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N.S.

Dundas Stone

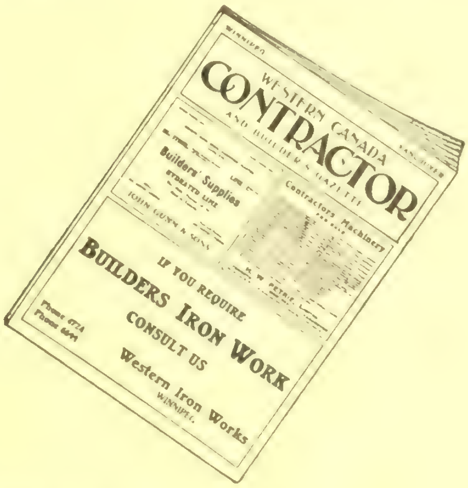
All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

ROCALITE
The Ready Mixed
Hard Wall Plaster
Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



WESTERN CANADA CONTRACTOR AND BUILDERS' GAZETTE

Builders' Supplies

Contractors Machinery

IF YOU REQUIRE BUILDERS IRON WORK CONSULT US

Western Iron Works WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U.S. Letters Patent.

Toronto Canada

Sand and Gravel

We can supply you with sand and gravel, screened. Pip Run and Pea Gravel

Building Sand

Let us quote you on your next job

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664, 665 Evenings, North 2107, 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or airtight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**
London, Canada Limited
Toronto Office: 103 Pacific Bldg.

Globe Furniture Co., Limited

Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

Send Plans and Specifications for Estimates

The
Globe Furniture Co., Limited
Toronto Office: 90 Yonge St.
Phone Main 5944
Main Office and Factory: Walkerville, Ont.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

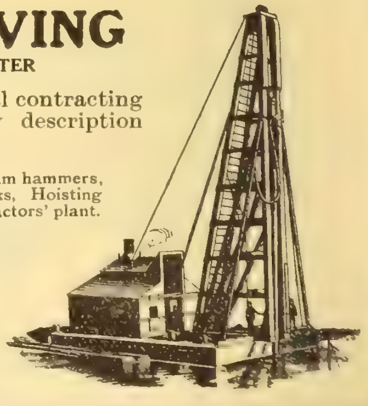
PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

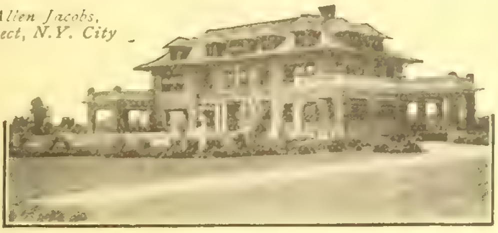
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Harry Allen Jacobs, Architect, N.Y. City



Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving strains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Central Supply Co., Regina

55%

WATER WASHED SAND
Registered

PURE SILICA

Sand & Supplies, Limited

Main 4507 - - TORONTO

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

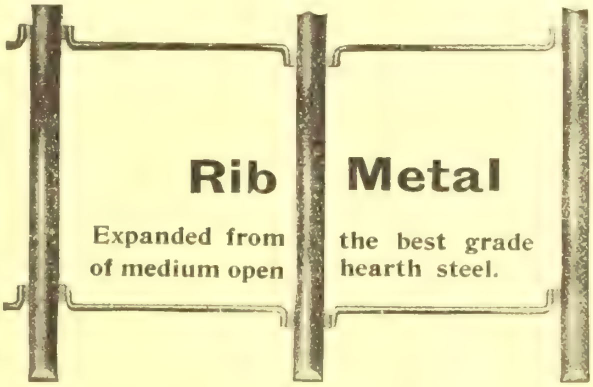
Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



Rib Metal

Expanded from the best grade of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver.
Agencies: Quebec, Halifax.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

A. LEOFRED

(Graduate of Laval and McGill)

Civil Engineer

Specialty: **Waterworks**

39 St. John St., QUEBEC Telephone Bell 545.

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
Waterworks, Sewerage and Electric Plants
Concrete and Steel Bridges and Buildings
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 182 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA aud H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

Frank Barber, York County Engineer.
C. R. Young, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The
KATIE
Foundry,
Galt, Ont.

Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Established 1882

THE COMMERCIAL

The WEEKLY FINANCIAL, COMMERCIAL & GENERAL TRADE NEWSPAPER of the GREAT WEST,

Winnipeg Manitoba

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work . . $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.
Floor Tile—½-inch square 65 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, firsts 70 cents.
Capping Coves and corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent., steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30 $1.15, 18 x 36, $1.95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.
Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.80 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, 95 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 92 cents per gallon of 9 lbs.
Turpentine, in barrels, 85 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

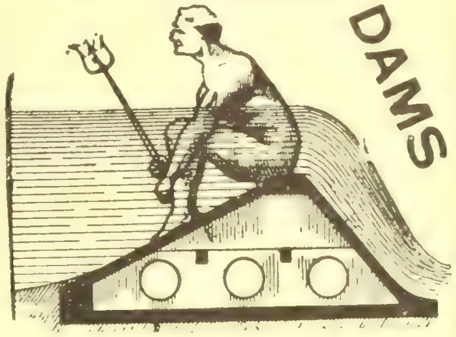
J. H. McCorkindale, contractor, Owen Sound, Ontario, is stated to have assigned to E. E. Miller.

The Ottawa Steel Castings Company, Limited, Ottawa, Ontario, are advertising business for sale.

The International Supply Company, manufacturers and builders' supplies. Ernest Lesperance registered.

The British Columbia Gazette gives notice of the incorporation of the following companies: Ruskin Logging Company, Limited, capital [illegible]; The Wood Motor and Taxicab Company, Limited, capital $100,000; Rupert Marine Iron Works and Supply Company, Limited, capital $25,000; Imperial Power Company, Limited, capital $01,000; The North Star Lumber Company, Limited, capital $500,000; The Whitney Engineering Company, capital $10,000; British Canadian Lumber Company, Limited, capital $2,000,000; American Timber Holding Company, capital $6,000,000

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting Contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

GERMAN ALSEN, at higher prices than competitors, has again this year been awarded the most important contracts of the World, because practical tests by leading Engineers proved its merit and relative economy.

Note the following:

		1905—1906		1905—1909
MEXICO CITY		120,000 bbls.	U.S. PHILIPPINE GOVMT.	40,000 bbls.
NECAXA DAM	(shipping instructions so far 60,000 bbls.) approximate amount	175,000 bbls	GOVMT. ORDER SOUTH AMERICA	150,000 bbls.
XOCHIMILCO WATER WKS., MEX.	approximate	200,000 bbls.	RIO DE JANEIRO, SATOS, ETC.	40,000 bbls.

- Also enormous quantities for the PACIFIC COAST, AUSTRALIA, ENGLAND, SOUTH AFRICA, &c. -

There is always a certain trade who will pay for the best. We also make American Alsen, the highest grade of domestic Portland cement.

CEMENT 45 BROADWAY, NEW YORK CITY CEMENT

We protect our customers!

See page 155 in "Sweet's" for full particulars

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co.
Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

TRUE ECONOMY

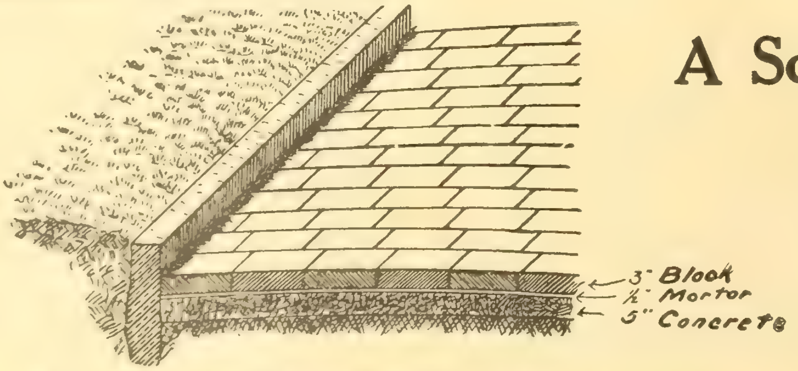
involves the use of the best available materials in your business. On this account, wise contractors are specifying **GREENINGS** when ordering such things as

Wire Rope, Trussed Steel Wire Lathing
Reinforcing Wire Gravel Screens
Wire Guards, Chains

These goods are made in Canada's oldest and best equipped wire drawing, wire weaving, wire rope making and metal perforating mills. Every article is guaranteed perfect in material, workmanship and finish.

Catalogs on request

The B. Greening Wire Co.
Hamilton, Ont. Limited Montreal, Can.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

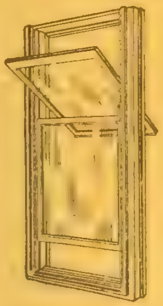
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

FIREPROOF BUILDINGS

are **not** Fireproof without

FIREPROOF WINDOWS



Specify DOUGLAS BROS.' Fireproof windows on your next contract and insist upon getting them. These windows have been thoroughly tested by the National Board of Fire Underwriters and found to comply with their requirements.

Send for a copy of our interesting booklet.

Douglas Brothers, Limited

Toronto, Ont. - - - - Montreal, Que.

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

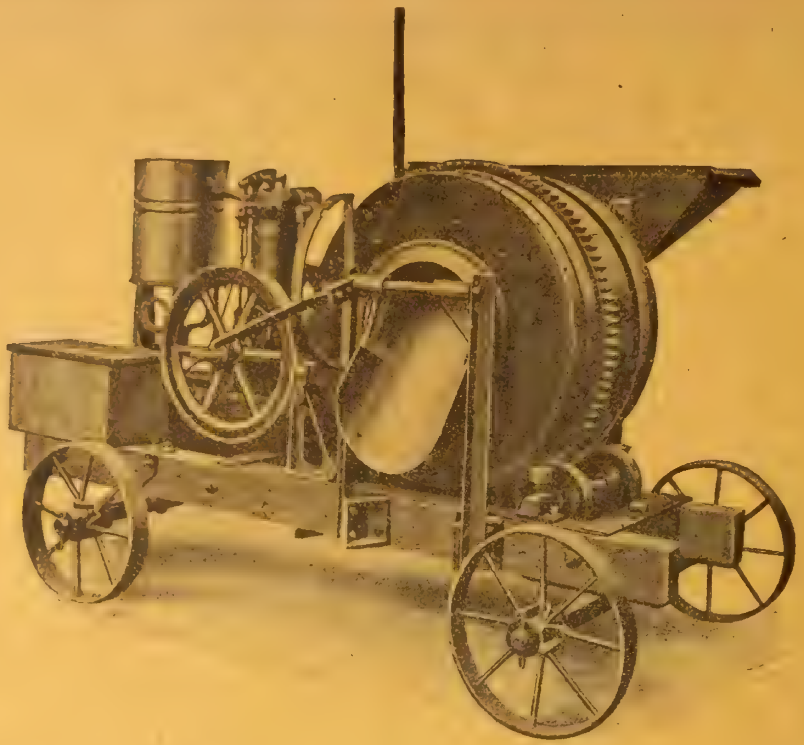
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



This is Every Man's Mixer

NO. 4 RANSOME—NEW 1910 MODEL

At last the demand for a really **small** concrete mixer is satisfied. Hold on, now, Mr. Big Contractor, that doesn't let **you out**, either. This is **Every Man's Mixer**—the mixer that fits into everybody's need. There isn't a concrete job on earth so small that it can't be done better and cheaper with this new model No. 4 Ransome, and there isn't a contractor anywhere whose work is so big that he will not find it a convenience and an economy to have one of these little No. 4's in addition to his larger machines. The No. 4 can be used on the small, isolated parts of jobs where it wouldn't pay to move a big machine.

Everybody who builds concrete walls, concrete walks, concrete **anything**, can have the best concrete that can be made at the least possible cost, because our new No.4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an **exact reproduction**, on a small scale, of the Ransome that made the correct mixing of concrete **cheap**—it's the same wonderful mixer in miniature. This is **the first really modern, effective, and economical small mixer ever put on the market.**

The following description of the No. 4 Ransome will show you what a truly **complete** and highly efficient mixing outfit you can buy at a very low price.

It has a batch capacity of 4 cubic yards per hour, which is ample for any small concrete job.

It is made and sold in **one way only**, i.e., **mounted on trucks**, with a Gasoline Engine, **direct drive.** This is a powerful engine for its rated H.P. and the best designed—a most perfect-operating engine.

The No. 4 is fully equipped with **Gasoline Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates** and All Necessary Engine and Mixer Fittings—**an absolutely complete outfit, ready for perfect operation.**

The Drum is 36" in diameter and 24½" in length, and has a speed of 24 revolutions per minute.

For its size this is the most substantially built mixer. The drum plates are ⅛" thick; the scoops ⅛" thick; the counter shafts 1 7/16"; the traction rings ½"; face of traction rings 1½".

The mixer has only 16 parts all told and **only four wearing parts.** It is the Extreme of Simplicity—you can keep one extra part on hand—a journal. The journals are the only wearing parts. No danger of breakdowns. It is everlastingly durable and reliable.

The No. 4 Ransome is a great time saver in every respect. The charging hopper is being filled **while the batch is mixing,** so that no time is lost in charging. The batch is instantly discharged by merely reversing the discharge chute.

It is also a great economizer of **time** and **labor** because it is **not a tilting mixer**—it needs no room for clearance—is mounted several feet lower than any tilting mixer—a great saving in time and labor of elevating the materials into the mixer.

The No. 4 Mixer is equipped with a **series of blades or scoops inside the** drum, which produce a rubbing-grinding contact of the particles in the concrete, a combination of rolling contact with forcible kneading. Being the same in this respect as the larger Ransomes, it follows that the user of the new No 4 Ransome, although mixing in small batches, will get precisely the same **intimate** and **thorough** mixture for which the Ransome is unique. The user of a No. 4 may know positively in advance that his concrete will be a perfect, uniform mixture—sound throughout—no unmixed spots anywhere—no danger of the concrete crumbling after setting.

Because of this thorough mixing, the No. 4 Ransome permits of **real cement economy.** It will give **maximum** strength with the **minimum** cement countenanced by engineers.

The new 1910 Model No. 4 Ransome is small, compact, easily **portable.** Mixer, engine, and trucks complete, weigh 1750 lbs.

We carry No. 4's in our Warehouses for immediate delivery. Write for price, terms and additional information.

We give with each of these mixers an absolute and unequivocal **guarantee** that the No. 4 Ransome under equal conditions will mix more concrete, mix it better, in less time, and with less labor, repairs and expense, than any other mixing device.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **E. A. Earle & Co., Vancouver**

Vol. 24 Toronto, July 20, 1910 No. 29

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps, Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE

The **Smart-Turner Machine Company** Limited
HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

"Redcliffe"

TRADE MARK REDCLIFFE

Corrugated Iron

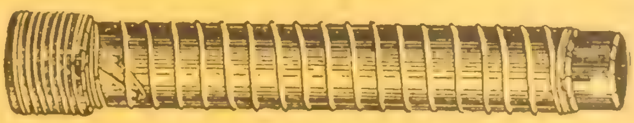
The most popular Corrugated Iron in Canada

SOFT LIGHT

ALWAYS RELIABLE

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

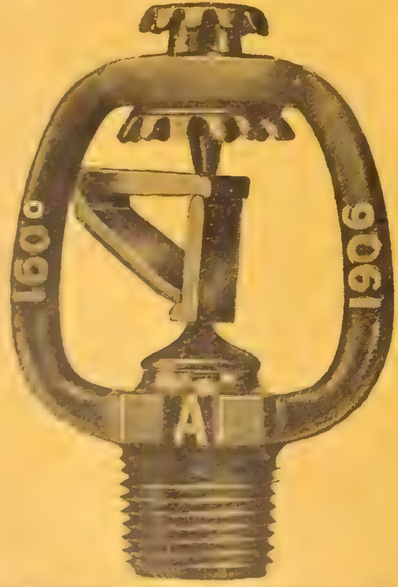
The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

$20,000,000.00!



The "Rockwood" Approved by all Canadian and American Insurance Associations

Canada's Annual Fire Loss. What Proportion Do You Pay?

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums
For particulars and free estimates communicate with

The Rockwood Sprinkler Co., of Canada, Limited, Montreal

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Automatic Sprinklers
Page

Rockwood Sprinkler Co ... 3

Architectural Iron Work

Canada Wire Goods Mfg. Co ... 15
Dennis Wire & Iron Works ... 58

Boilers

Inglis, John ... 22
Jenckes Machine Co ... 2
Marsh & Henthorn ... 49
McDougall Caledonian Iron Works ... 31
Mussens Limited ... 32
Taylor-Forbes Co ...
Waterous Engine Works Co. ... 52

Brick

American Enamelled Brick Co.
Canadian Pressed Brick Co ... 16
Don Valley Brick Works ... 7
Hamilton Pressed Brick Co ... 10
Milton Pressed Brick Co ... 5
Port Credit Pressed Brick Co ... 16
Toronto Pressed Brick Co. ... 34

Bridges (Steel)

Canadian Bridge Co ... 54
Cleveland Bridge Co. ... 54
Dickson Bridge Works ... 53
Dominion Bridge Co ... 54
Phoenix Bridge and Iron Works ... 55
Pennsylvania Steel Co. ... 54

Builders' Hardware

Taylor-Forbes Co ...

Cement

Alsen Portland Cement Co ... 62
Britnell & Co ... 58
Bremner, Alex ... 57
Canada Cement Co ... 3
McNally & Co., W ... 59
Morrison & Co., T. A ... 60
Rogers, Alfred ... 4
Rogers Supply Co ... 31
Sand and Supplies ... 59
Stinson-Reeb Builders Supply Co ... 58

Conduits
Page

Conduits Co., Limited ... 58

Concrete Mixers and Machinery

Canada Foundry Co ... 14
Cropp Concrete Machinery Co ... 6
Goold, Shapley & Muir ... 9
Hopkins & Co., F., H ... 64
Jenckes Machine Co ... 2
London Concrete Machinery Co ... 21
Mussens Limited ... 32
Morrison & Co., T. A ... 60
Rogers Supply Co ... 31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co ...
Canada Wire Goods Mfg. Co ... 15
Hamilton Iron & Steel Co ... 34
Trussed Concrete Steel Co ... 59

Contractors' Plant

Beatty & Sons, M. ... 55
Hepburn, John T ... 17
H. & E. Lifting Jack Co ... 55
Hopkins & Co., F. H ... 64
Katie Foundry Co ... 60
Marsh & Henthorn ... 52
Mussens Limited ... 32

Crushers (Stone and Rock)

Hopkins & Co., F. H ... 64
Jenckes Machine Co ... 2
Mussens Limited ... 32
Morrison & Co., T. A ... 60

Corrugated Iron

Galt Art Metal Co ... 20
Metallic Roofing Co ... 53
Metal Shingle and Siding Co ...
Ormsby, A. B., Limited ... 5
Roofers Supply Co ... 49

Contractors
Page

McIlwraith, Jas. A ... 60

Drills

Beatty & Sons, M ... 55
Canadian Rand Co ... 1

Drilling Contractors

Harvey, J ... 61

Dredges

Beatty & Sons, M ... 55

Engines

Inglis, John ... 22
Jenckes Machine Co ... 2
Mussens Limited ... 32
Waterous Engine Works Co ... 52

Excavators

Harris, J. W ... 11

Electrical Apparatus and Supplies

Northern Electric & Mfg. Co ...

Engineers (Civil and Mechanical

Barber & Young ... 60
Chipman & Power ... 60
Bowman & Connor ... 60
Davis & Johnston ... 60
Farmer, John T ... 60
Fuce, Edw. O ... 60
Galt Engineering Co., John ... 60
Hunt & Co., Robt. W ... 59
Inglis, John ... 22
Leofred, A ... 60
Lea & Ferguson ... 60
Mace, T. Harry ... 60
Mitchell, C. H ... 60
McRae, John B ... 60
Moore & Scollan ... 60

Fire Apparatus
Pag

Morrison & Co., T. A ... 62
Seagrave, W. E ... 58

Fireproof Doors and Windows

Douglas Bros ... 63
Mussens Limited ... 32
Ormsby, A. B ... 5

Granite and Marble

Laurentian Granite Co ... 60
Missisquoi Marble Co ... 13
Rogers Supply Co ... 31
Smith Marble & Construction Co ... 49

Glass

Chance Brothers & Co ...
Consolidated Plate Glass Co ... 49
Luxfer Prism Co ...
Thompson & Co., B. & S. H ...
Toronto Plate Glass Importing Co ... 1

Heating Apparatus

Jenckes Machine Co ... 2
Leonard & Sons, E ...
Taylor-Forbes Co ...

Hoisting Machinery

Beatty & Sons, M ... 55
Inglis, John ... 22
Jenckes Machine Co ... 2
Hopkins & Co., F. H ... 64
Marsh & Henthorn ... 49
Mussens Limited ... 32
Scott Machine Co ... 5

Hydrants

Canada Iron Corporation ... 57
Gartshore-Thompson Pipe Co ... 56
Kerr Engine Co ... 8

Lime

Christie, Henderson & Co ... 17
Jamieson Lime Co ... 55

(Continued on page 6.)

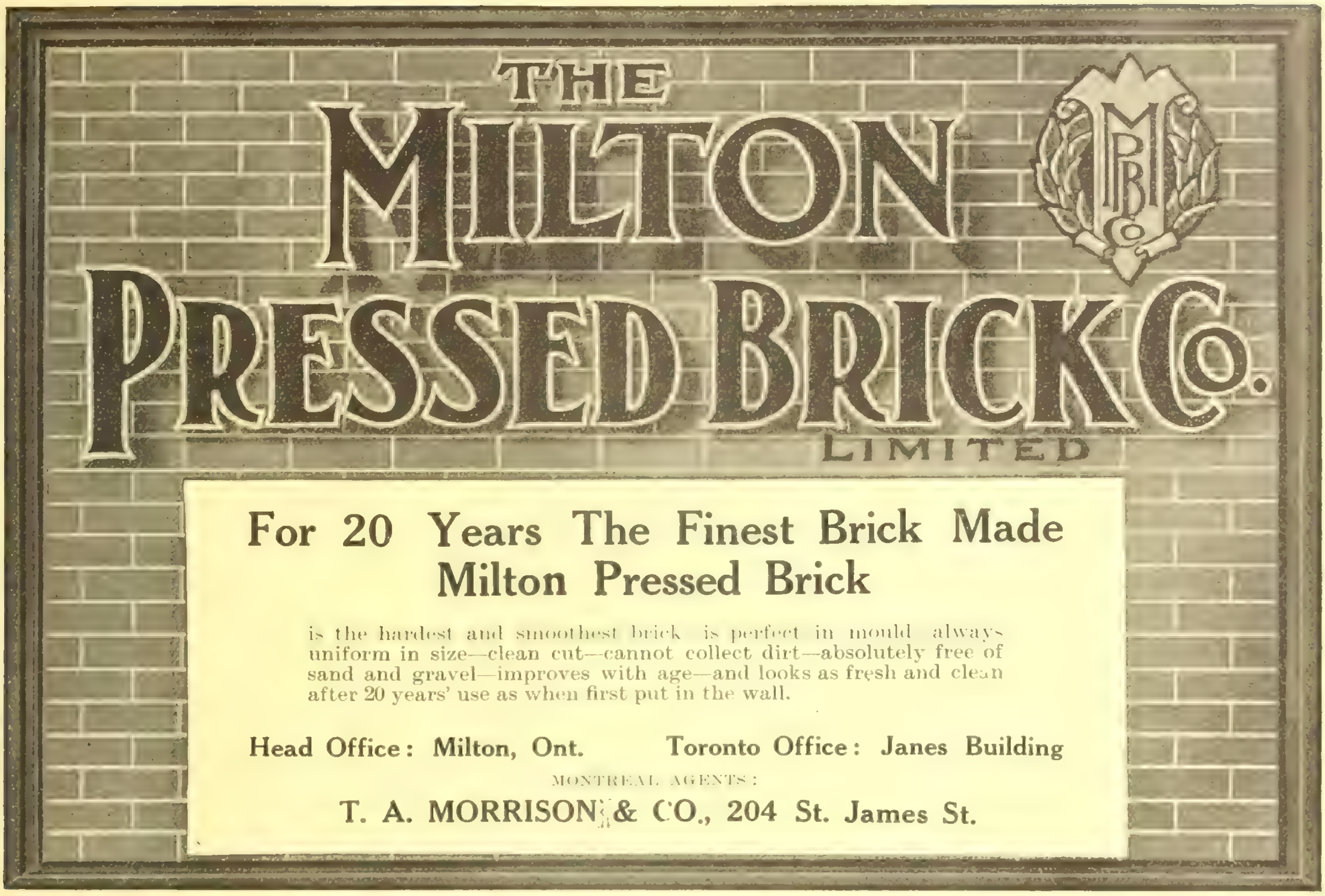
Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

General Sales Offices :
PHONE MAIN 4345 306-307 Stair Building, TORONTO



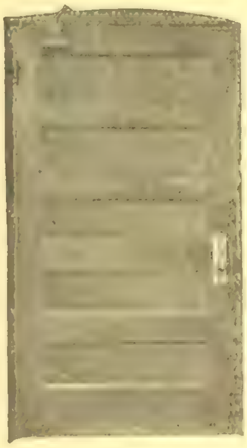
THE MILTON PRESSED BRICK Co. LIMITED

For 20 Years The Finest Brick Made
Milton Pressed Brick

is the hardest and smoothest brick is perfect in mould always uniform in size—clean cut—cannot collect dirt—absolutely free of sand and gravel—improves with age—and looks as fresh and clean after 20 years' use as when first put in the wall.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

MONTREAL AGENTS:
T. A. MORRISON & CO., 204 St. James St.



They look like wood but they are fireproof

Our KALAMEINED CLAD DOORS are made in any design, finished in any color, **no bulging,** no nail heads and yet they are Fireproof and mean a reduction in Insurance Rates. The largest and best office buildings and apartment houses in the country have installed them, and have found them a valuable investment.

Let us give you approximate figure on these goods.

A. B. ORMSBY, Limited

Factories
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish Page
Batts Limited ... 51
Bonde Lumber Co ...
DeLaplante, Ltd ... 30
Eaton & Sons, J. R. ... 21
Georgian Bay Shook Mills ... 63
Globe Furniture Co ... 58
Rhodes Curry & Co ... 53
Sanitary Floor Co. ... 57
Siemon Bros. ... 51
Standard Mills, Limited ... 62
Woodstock Lumber Co. ... 62

Metal Lath
Galt Art Metal ... 20
Metallic Roofing Co. ... 53
Noble C. W. ... 20

Meters
Hopkins & Co., F. H. ... 64
Neptune Meter Co ... 15

Paving and Paving Materials
Dominion Carbolineum Works ... 12
Metropolitan Paving Brick Co. ...
Ontario Asphalt Block Co. ... 62
Silica Barytic Stone Co., of Ontario.. 61

Plaster
Albert Mfg. Co. ...
Britnell & Co ... 58

Pipe
Canadian Pipe Co. ... 56
Dominion Wood Pipe Co ... 9
Gartshore-Thomson Pipe Co. ... 56
Municipal Construction Co ... 17
National Iron Works ... 57
Pacific Coast Pipe Co. ... 1
Pedlar People ... 16

Power Engines
Inglis Co., John ... 22

Paints and Varnishes
Cabot, Samuel ... 59
Glidden Varnish Co. ...
International Varnish Co. ... 56
Paterson Mfg. Co. ...

Pile Driving Page
Lincoln Construction Co. ... 58

Pumps and Pumping Machinery
Beatty & Sons, M. ... 55
Goulds Pump Co. ...
Hopkins & Co., F. H. ... 64
Inglis Co , John ... 22
Martin Steam Pump Co. ... 53
McDougall Caledonian Iron Works, John ... 31
Mussens Limited ... 32
Ontario Wind Engine & Pump Co. 55
Smart-Turner Machine Co. ... 1
Waterous Engine Works Co. ... 52

Roofing Materials
Barrett Mfg. Co. ...
Brantford Roofing Co ... 11
Galt Art Metal Co. ... 20
Metallic Roofing Co. ... 53
Metal Shingle & Siding Co. ...
Noble, Clarence W ... 20
Rogers Supply Co. ... 31
Roofers Supply Co. ... 52

Railway Supplies
Gartshore, John J. ... 60
Hopkins & Co., F. H. ... 64
Mussens Limited ... 32

Road Machinery
American Road Machinery Co. ... 14
Case Threshing Machine Co. ... 19
Climax Road Machine Co. ... 56
Morrison & Co., T. A. ... 60
Mussens Limited ... 32

Sewer Pipe
American Sewer Pipe Co. ... 18
Britnell & Co ... 58
Canada Iron Corporation ... 19
Dominion Sewer Pipe Co. ... 18
Gartshore-Thomson Pipe Co. ... 18
Hamilton & Toronto Sewer Pipe Co. 19
National Iron Works ... 57
Ontario Sewer Pipe Co. ... 10
Rogers Supply Co. ... 31
Standard Drain Pipe Co. ... 18
Toronto Pottery Co ... 18

Sand
Rogers Supply Co. ... 31
Sand & Supplies ... 57

Stone Page
Britnell & Co. ... 54
Christie, Henderson & Co. ... 17
Consolidated Stone Co. ... 20
Contractors' Supply Co. ... 49
Corinthian Stone Co. ... 15
Crushed Stone, Limited ... 59
Doolittle & Wilcox ... 57
Hagersville Contracting Co. ... 5
Laurentian Granite Co. ... 69
Maloney John ... 55
Morrison & Co., T. A. ... 60
Myers, Oakley ... 59
Robertson, D ... 59
Rogers Supply Co. ... 31
Roman Stone Co ... 17
Sackville Freestone Co. ... 15
Sand and Supplies ... 59
Wiarton Stone Quarry ... 59

Structural Iron and Steel
Buffalo Steel Co. ...
Dominion Bridge Co. ... 54
Hamilton Iron & Steel Co. ... 34
MacKinn n Holmes & Co. ... 55
Pennsylvania Steel Co. ... 54
Phoenix Bridge & Iron Works ... 55
Queen City Foundry Co. ... 60
Reid & Brown ... 60

Shovels (Steam)
Beatty & Sons, M. ... 55
Hopkins & Co., F. H. ... 64
Mussens Limited ... 32

Shingle Stains
John, Cabot ... 59

Slate
Roofers Supply Co. ... 52

Steel Shingles and Ceilings
Galt Art Metal Co. ... 20

Safes and Vaults
Taylor, J & J ...

Sheathing Papers
Cabot, John ... 59

Telephone Supplies
Northern Electric & Mfg Co. ...

Tiles
Smith Marble & Construction Co... 49

Tanks and Stand Pipes
Inglis, John ... 22
Jenckes Machine Co. ... 2
Marsh & Henthorn ... 49
McDougall Caledonian Iron Works.. 31
Ontario Wind Engine & Pump Co.. 55

Typewriters
United Typewriter Co. ... 62

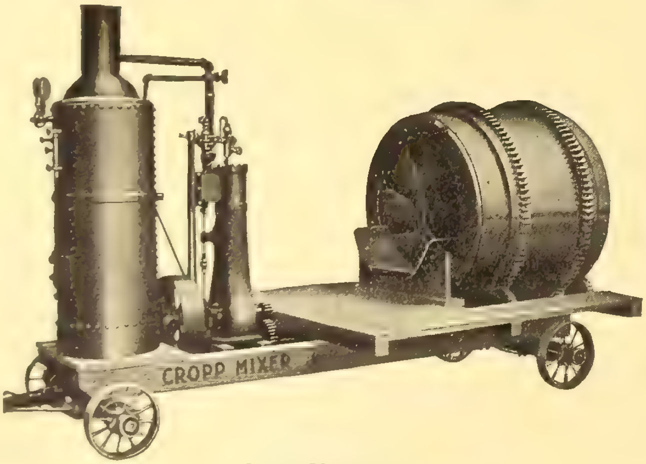
Valves
Canada Iron Corporation ... 57
Gartshore-Thomson Pipe Co. ... 56
Kerr Engine Co. ... 8
Standard Fitting & Valve Co ... 63

Ventilating System
Gardiner & Gaskill ... 53

Wire Rope
Dominion Wire Rope Co. ... 64
Greening Wire Co., B. ... 56
Smith, Thos. & Wm. ...

Wire Fences and Screens
Canada Wire Goods Mfg. Co. ... 15

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street,
Chicago, Ill., U. S. A.

Don Valley Bricks

and Porous Terra Cotta Fireproofing

D
O
N

D
O
N

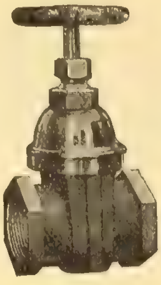
The Goods with the Reputation

DON Pressed Bricks
V Enamelled Bricks
A Vitrified Bricks
L Wire-cut Bricks
L Porous Terra Cotta Bricks
E Porous Terra Cotta Fireproofing
Y in Arches, Blocks and Furring

THE DON VALLEY BRICK WORKS

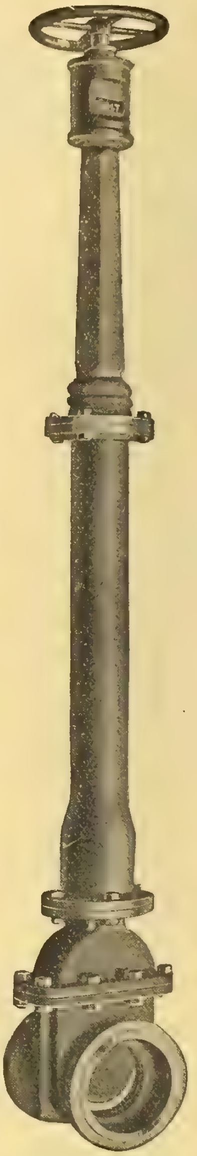
Head Office: 36 Toronto St., TORONTO
Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Water Crane and Hydrant Combination



Webber Gate (Brass)

Hub End Gate



Indicator Post for Fire Protection Valve

K E R R

Our policy of careful manufacture for severe duty is maintained throughout our whole establishment and as a result our products are of the highest quality.

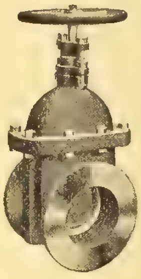
Every "Kerr" valve is accurately made and finished. They are perfectly tight when closed and have full area when open.

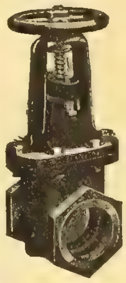
We have a complete catalogue

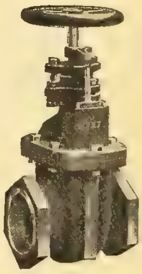
Have you a copy of it?

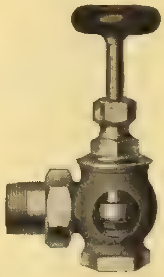
VALVES

IRON BODY GATE VALVES





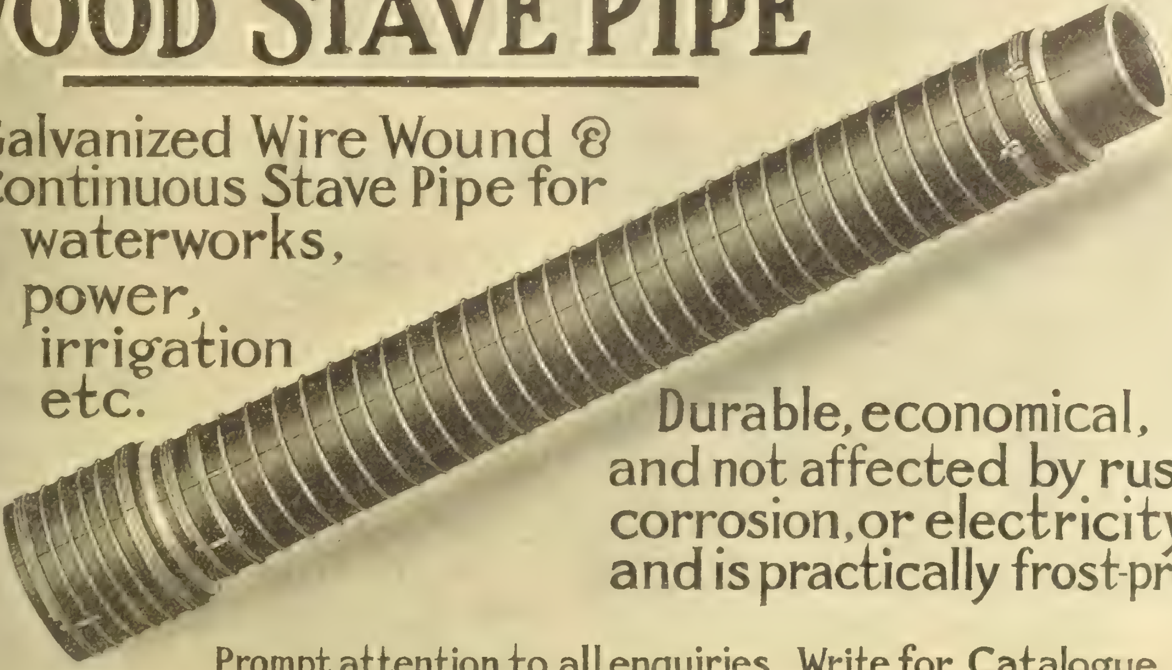




Compression Hydrant

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

WOOD STAVE PIPE



Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company, Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

When You Want Good Sewer Pipe

Don't forget that there is one place where you will be sure of the **best** article and the very best treatment.

Drop a line to

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

"MIMICO" Pipe Makes the Sewer Sure

Toronto Officials Recognize the Fire-Resistant Qualities of

Brantford Roofing

Along with slate and iron, Brantford Roofing is accepted by the City Architect and Chief of the Fire Department for use in the most congested district in Toronto. We have a certificate to that effect. Do you know of any other ready roofing that has such a certificate? We think not.

The Toronto officials recognize a REAL fire-resistant roofing when they find one. So do the fire-insurance companies. They give lower rates for buildings covered with Brantford Roofing.

These facts are worthy of a builder's or contractor's most careful consideration when selecting or specifying roofing material for his contracts.

Send for interesting Roofing Book and Samples.

Brantford Roofing Company, Limited

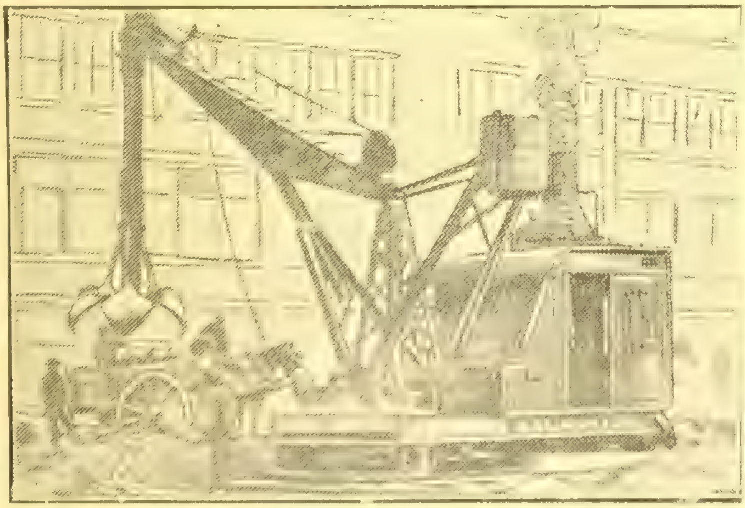
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

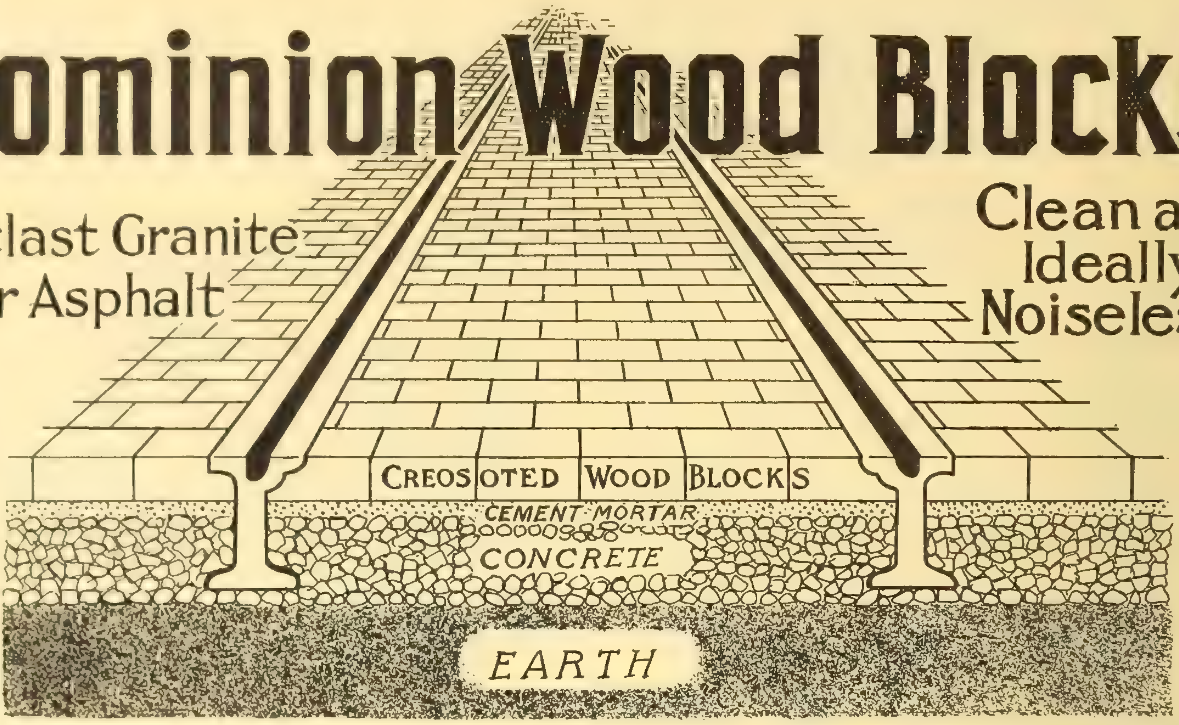
J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Most Durable Pavement in the World

Dominion Creosoted Wood Paving Blocks make the best pavement for all classes of service. It is the one pavement that won't need the annual attention of the repair gang.

Dominion Blocks are made of Douglas Fir, the best timber for this purpose that is grown under the sun. Only live logs are used thus ensuring a perfect block.

The process to which we subject the blocks makes them waterproof. Decay is also prevented, because the blocks are filled with creosote at moderate temperature.

The pavement will be found sanitary, quiet as tan bark and free from dust.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

Right Here in Canada

Architects and Contractors can obtain marble with all the richness and depth of color that is to be found in the finest imported product.

Missisquoi Marble

is quarried in six distinct varieties which affords excellent opportunities for following out beautiful color schemes.

Light Grey
Dark Grey
Green Grey
Cream with Green Vein
Cream with Mottled Green
Cloudy Green and Pink

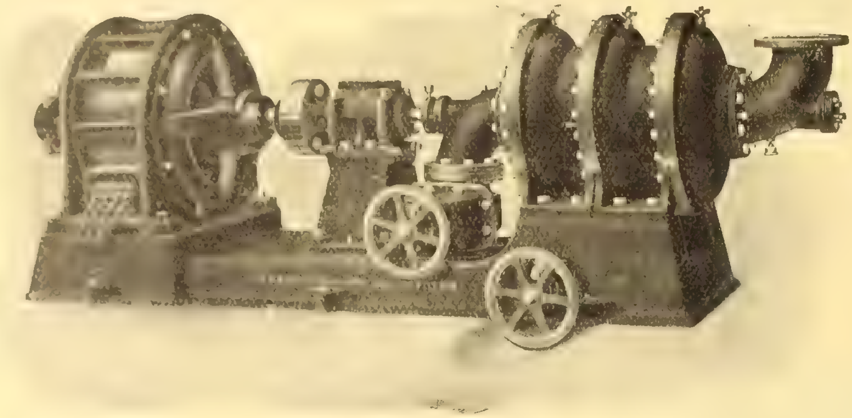
The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
Bosse & Banks, Quebec
Jas. Robertson & Co., St. John, N. B.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver
General Contractors' Supply Co., Halifax
Also Branch Office, 85 Sparks St., Ottawa, Ont.

Turbine Pumps



Single and Multiple Stage

Low Cost of Installation

Simple in Construction and Maintenance

Effecting Great Saving in Space and Cost of Installation

Canada Foundry Company, Limited

Head Office, TORONTO

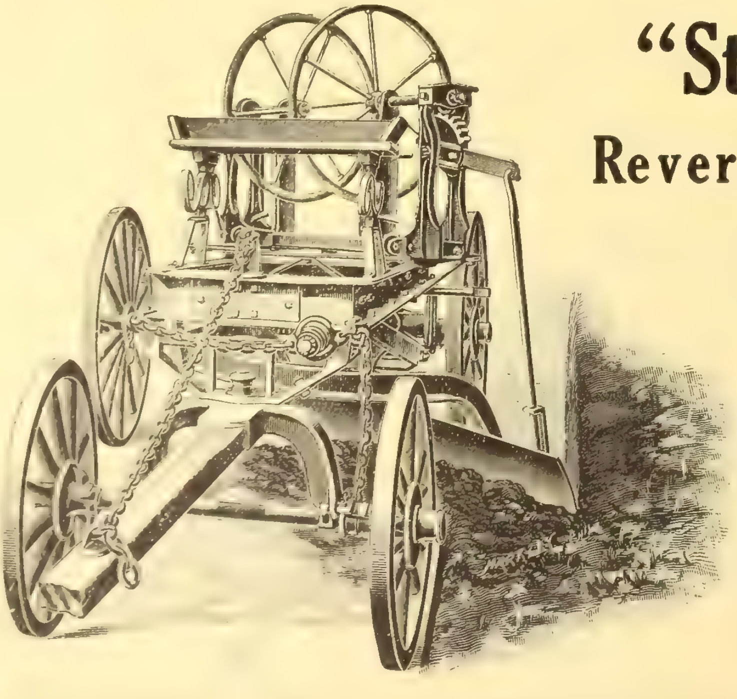
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery

Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

Get our Prices on our

Concrete Reinforcement

Continuous lengths or in sheets cut to size

CANADA WIRE GOODS MFG. CO.
Hamilton

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone

Company, Guelph

from the hardest substances available

Write the

Corinthian Stone

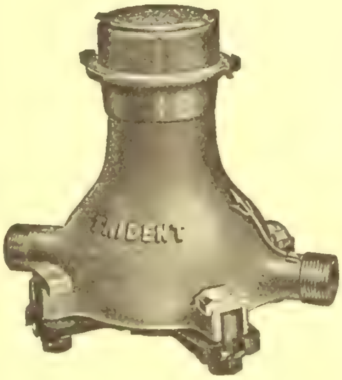
Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless, fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.

CUT STONE

All kinds of Canadian and American Stone

D. ROBERTSON & CO.

Limited

Offices:
[illegible] Yonge Street, TORONTO
MILTON, Ont.

Yard:
[illegible] Dupont, TORONTO

Quarries:
MILTON
CREDIT FORKS

[illegible]
[illegible]
[illegible]

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of obsorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

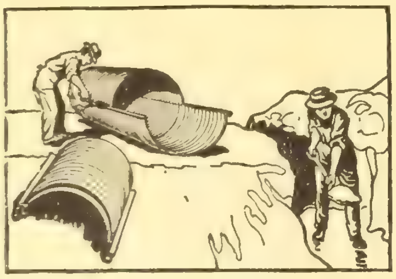
We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Here is the PRACTICAL Culvert!

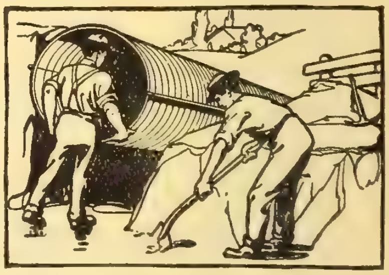
FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.



PEDLAR
NESTABLE GALVANIZED
CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers

The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivelled for **every** culvert purpose.



All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

HALIFAX
16 Prince St.
CHATHAM
[illegible] King St. W.

LONDON
86 King St.
QUEBEC
127 Rue du Pont

WINNIPEG
76 Lombard St.
REGINA
1901 Railway St. S.

MONTREAL
321-3 Craig St.
CALGARY
1112 First St. W.

PORT ARTHUR
45 Cumberland St.
VICTORIA
434 Kingston St.

OTTAWA
423 Sussex St.
ST JOHN N.B.
42-46 Prince William St.

TORONTO
111-113 Bay St.
VANCOUVER
821 Powell St.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE
All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

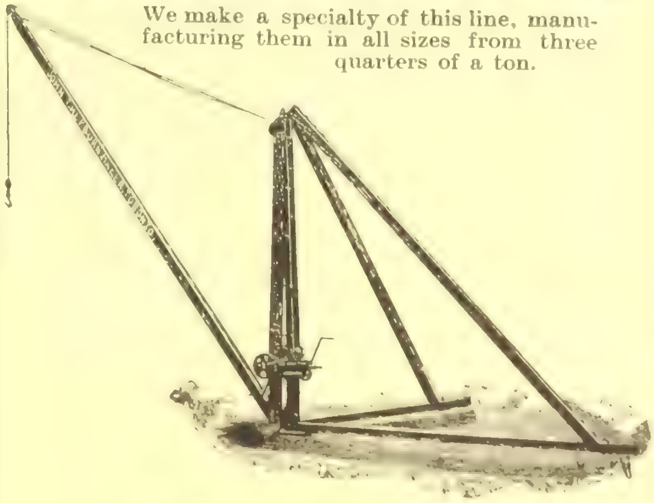
is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds

Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

Sewerage Acids do not affect the

Sizes 3 in. to 36 in.

The Standard for Quality in the United States and Canada

Fancy shapes in Chimney Tops, Fire Clay Stove Pipe and Fittings, Wall Coping, Fire Clay Flue Liners, Fire Brick and Fire Clay.

The Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe
Single and Double. Strength, 3″ to 36″

Clay Conduits Single and Multiple

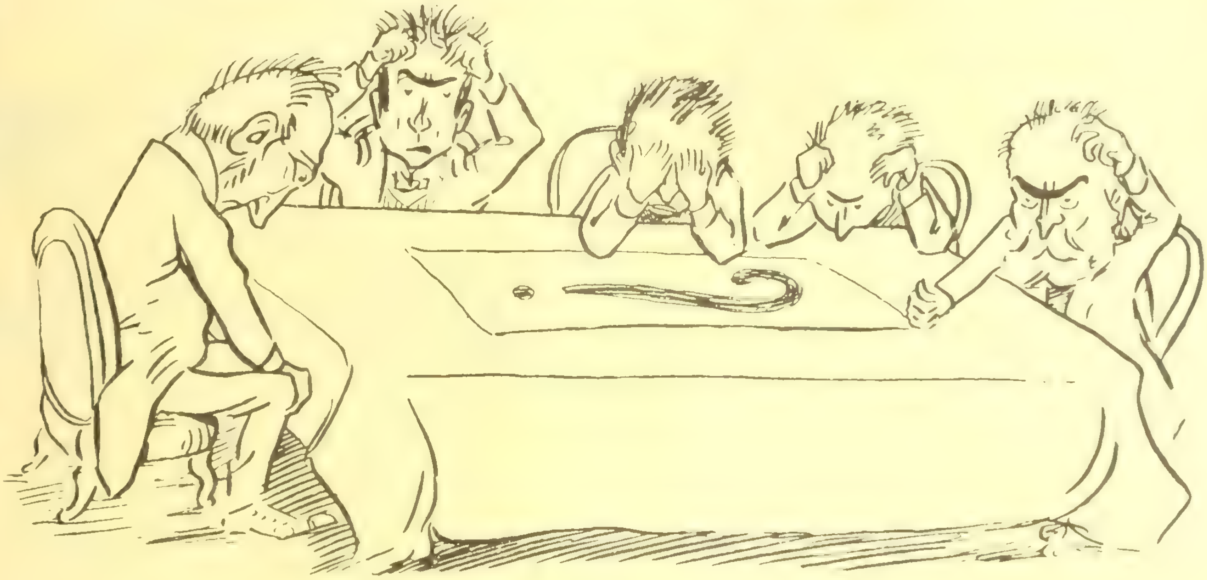
Samples furnished on request.

WE INVITE COMPARISON

Let Us Solve Your Drainage and Sewerage Problems

IT PAYS TO PAY FOR QUALITY

THE PIPE THE PEOPLE PREFER

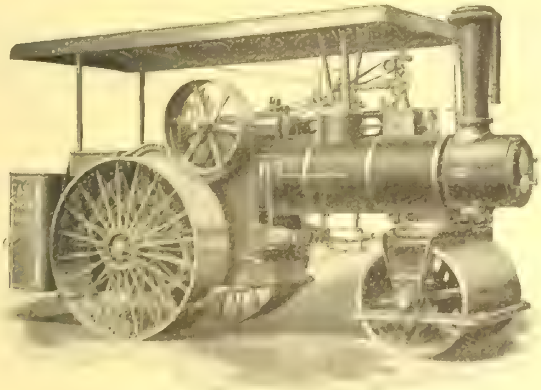


The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or write us

Hamilton and Toronto

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog [illegible] Guaranteed to do all or Anything that can be done by Any Other Make or Design of Road Roller

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, [illegible] Saskatoon, Toronto, Ottawa

Send for our Contractors' General Purpose Engine and [illegible] Tractor Catalog

---

Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

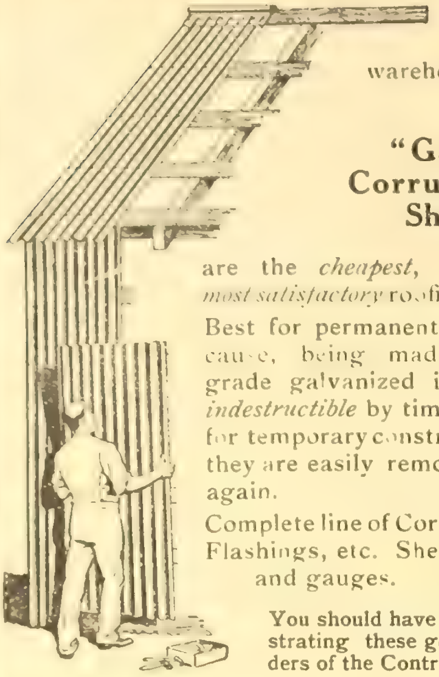
THE CEMENT ERA

[illegible] The Cement Era. [illegible]

The Cement Era Publishing Co.

1800 Monadnock Block - CHICAGO

Corrugated Iron



For factories, elevators, warehouses, barns, etc.

"Galt" Corrugated Sheets

are the *cheapest*, *handiest*, and *most satisfactory* roofing and siding. Best for permanent buildings because, being made from high-grade galvanized iron, they are *indestructible* by time or fire. Best for temporary construction because they are easily removed and used again.

Complete line of Corrugated Ridge, Flashings, etc. Sheets of all sizes and gauges.

You should have Catalog 4-B illustrating these goods. free to readers of the Contract Record.

THE GALT ART METAL CO., LTD.
GALT, ONTARIO
Winnipeg - - Dunn Bros.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

Interior of "Men's Own" Winnipeg—John Atchinson, Architect.
Herringbone Lath and Perfection Studs Used Throughout.

Herringbone Metal Lath

with Perfection Studs make the best fireproof partitions known. Like all fireproof partitions they expand in a fire. Unlike all others, they buckle, but do not crush. "Some Facts" a book about it sent you on request.

CLARENCE W. NOBLE
GENERAL SALES AGENTS
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.

Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

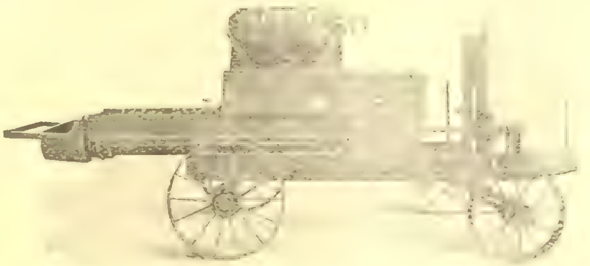
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers



Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save You Money
On the first cost of machine
On cost of operation
On cost of mixing concrete

OUR AUTOMATIC MACHINES do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials easily handled [illegible] **Less men required to operate.** Send for catalogue and state capacity desired.

We also manufacture a STANDARD DRUM BATCH MIXER in four sizes [illegible]. The most complete Drum Mixer [illegible]. We [illegible] Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent,	Geo. B. Oland & Co.	A.G. Brown & Co.,
52½ Princess St.,	28 Bedford Row,	1048 Westminster Ave.,
Winnipeg, Man.	Halifax, N. S.	Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is ⅜ inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilating the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horror.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

Please Send for Samples and Prices

J. R. Eaton & Sons

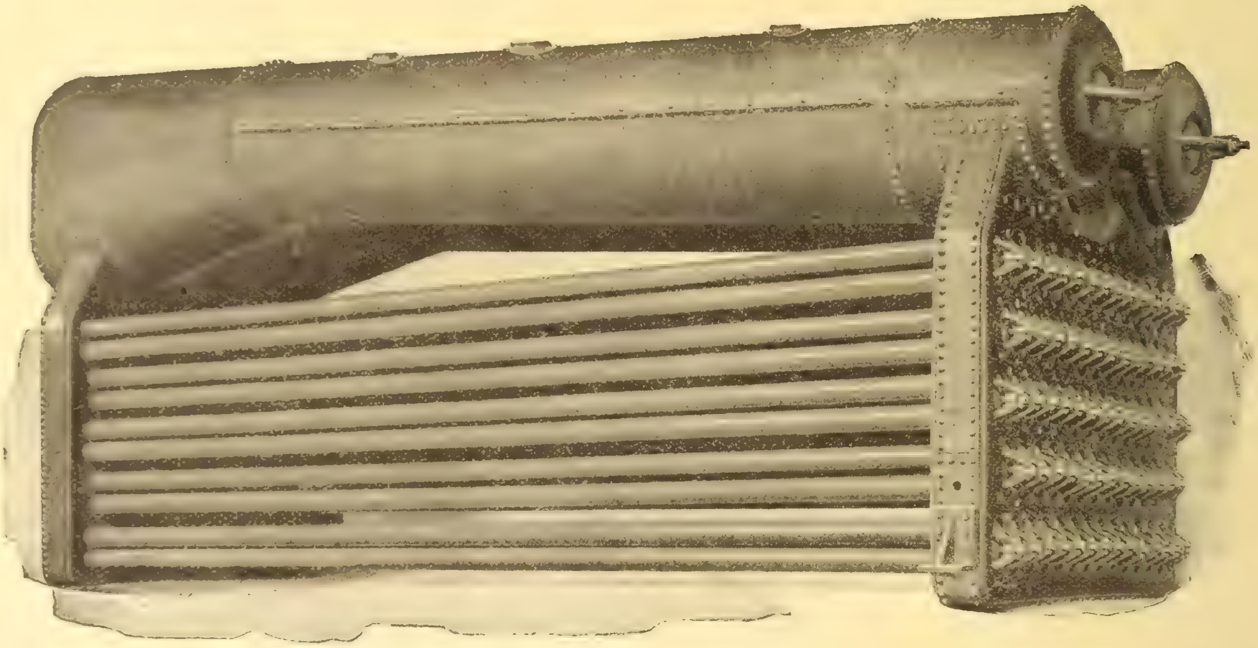
Orillia, Ontario

Montreal Agent THE HARDWOOD [illegible]
55 St. [illegible]

Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Berlin, Ont.

Tenders are being called until August 1st for compound duplex pumping engine. H. Hymmen, superintendent Berlin waterworks. For further information see "Tenders and For Sale Department" in this issue.

Estevan, Sask.

A by-law will be submitted for issue of $10,000 debentures for the purpose of constructing cement walks; also for $6,300 for the purpose of making a common sewer.

Collingwood, Ont.

Tenders are being called until July 30th for street paving. K. S. Macdonell, town engineer. For further information see advertisement in this issue.

Calgary, Alta.

Tenders will be called for shortly for lining the new city reservoir with cement. J. T. Child, City Engineer.

Kamloops, B.C.

This municipality is inviting tenders for modern cement sidewalks.

Longueuil, Que.

Improvements to the water front at this point by the construction of a boulevard is rumoured.

Montreal South, Que.

Preliminary steps for the establishment of a water and sewerage system are under way. Mayor Labonte and Councillors Kilgallen, Glenie and Duquette are the committee in charge.

Marysville, N.B.

The installation of sewage disposal works is being considered. A. D. McPherson, town clerk.

Montreal, Que.

Tenders will be called shortly by the City of Montreal for the construction of sewers on St. Timothee street, from St. Catherine to DeMontigny streets; Ontario avenue, from end of existing sewer to Pine avenue. Information at the office of the City Surveyor, John R. Barlow.

The civic authorities have voted $5,000 to assist in decorating city streets for the Eucharistic Congress.

Outremont, Que.

Tenders will be received until July 20th for sewer construction; also 80 man-hole covers. J. Kruse, secretary-treasurer.

Ottawa, Ont.

The Carleton County Council has authorized the issuing of 5 per cent. 20-year road debentures for $20,000.

Revelstoke, B.C.

The by-law to raise $27,000 for the extension of water system was passed. Work will be commenced at once.

Sydney, N.S.

On the 26th of July the ratepayers will vote on a proposition to borrow [illegible] for extension of water system.

Swift Surrent, Sask.

Tenders addressed to G. W. Bilbrough, secretary-treasurer, will be received until August 2nd for the following: (A) laying sewer and water mains; (B) constructing sewage disposal works; (C) constructing concrete settling tank and intake; (D) constructing frame building. Plans, etc., at town hall or at office of the engineer, J. Darlington Whitmore, Regina.

St. John, N.B.

The following tenders for permanent paving in Germain street were received: Carritte, Patterson Manufacturing Company, $12,676; McDonald & McLeod, $12,920; Westrumite Paving Company, Limited, $13,032; A. R. Clarke, $14,250. Mr. Clarke sent in an alternative bid for Apposite paving on Hassam foundation which amounted to $11,380. This was recommended for acceptance.

Toronto, Ont.

Tenders are called until July 26th for supply of 16, 20, 24 and 36 inch stop valves and 20 and 24 inch check valves. G. R. Geary, chairman Board of Works.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until August 2nd for supply of water meters for the year. Specifications, etc., at office of City Engineer.

Tenders are being called until July 26th for construction of the following: asphalt, bitulithic, and concrete pavements; travia macadam reconstruction, concrete curbs; concrete walks. G. R. Geary, chairman Board of Control.

Vancouver, B.C.

The following details of tenders for lining Little Mountain Reservoir have been sent in:—M. P. Cotton, Vancouver, concrete lining in bottom, $1.85 per sq. yd.; reinforced lining on sides, $2.85 per sq. yd.; rock surfacing, $1 per sq. yd. Geo. H. Webster, reinforced lining, $2.10 per sq. ft.; plain lining, $1.55 per sq. ft.; rock surface, $1 per sq. ft.; inlet and outlet, etc., $475. J. C. Kennedy, reinforced lining, $1.90 per sq. ft.; non-reinforced lining, $1.80 per sq. ft.; rock surface, 50c per sq. ft.; inlet and outlet, etc., $200. Waugh-Mulburn Construction Company, reinforced lining, $2.50 per sq. ft.; non-reinforced lining, $2.05 per sq. ft.; cement grout for rock surface, 20c per sq. ft.; oedistil, etc., $250. Wells Construction Company, Vancouver, reinforced concrete lining, $1.88 per sq. ft.; plain concrete lining, $1.42 per sq. ft.; rock surface, $1.20 per sq. ft.; inlet and outlet, etc., $500. Award given in last issue.

Winnipeg, Man.

Tenders addressed to Chairman Board of Control, will be received until July 21st for [illegible] M. Peterson, secretary.

AWARDED.

Brantford, Ont.

The Westrumite Company obtained contract for surface paving of Lorne Crescent at $1.29 the square yard, and the Warren Bitulithic Paving Company that for Darling street at $1.63.

Guelph, Ont.

The contract for paving Norfolk street (about 6,000 feet) has been awarded to the Westrumite Company at about $12,000.

Grand Falls, N.B.

The contract for installation of water system here has been awarded to Powers & Brewer, contractors, and embraces furnishing and laying 20,000 feet of cast iron pipe, reservoir, pumping station and pump.

London, Ont.

The board accepted the tender of the Barber Asphalt Company for resurfacing Dundas street from Wellington to Ridout, at $12,716.

Morden, Man.

Herman Campbell was given the contract for constructing 1,500 square yards of cement sidewalks at $1.30, and $2.50 for crossings. Other bids were: A. G. Selley, Morden, $1.40; Main & West, Winnipeg, $1.83; Geo. Gordon, Morden, $1.62.

Montreal, Que.

The contract for the sixth section of Sherbrooke street sewer was awarded to Keegan & Dillon for $68,768, the lowest.

Nanaimo, B.C.

Contractor Wardsworth of Victoria, has been engaged to lay seven miles of cement sidewalk here.

Ottawa, Ont.

We are informed that the contract for laying asphalt pavement on Wellington street was awarded to the City Engineer at $17,825.10. Others tendered as follows: Barber Asphalt Company, Ottawa, $19,267; Ottawa Construction Company, Ottawa, $20,616; Union Construction Company, $24,867. N. H. H. Lett, secretary Board of Control.

Peterboro, Ont.

The Township of Monoghan has awarded to H. Thurter, a contract for concrete walk construction at 12 cents a foot.

Sydney, N.S.

The following list of tenders for sewer construction in this city this year were sent in: Wm. Cooke, North Sydney, $22,661.50 (recommended for acceptance); Sutherland & Redding, North Sydney, $25,552.90; J. H. Treen, Sydney, $24,436.70; McDonald & McLeod, St. John, $27,055.50. Contract prices cover labor only, city supplying all materials, pipe, cement, brick, castings, etc. D. McD. Campbell, city engineer.

Toronto, Ont.

The contract for asphalt block pavement on College street between Manning Avenue and Dovercourt road has been awarded to J. Maguire at $12,486.

Vancouver, B.C.

The tenders received for asphalt pavement were as follows: [illegible] Palmer Bros. & Henning, $46,522; M. P. Cotton, [illegible] T. R. Nickson & Company, $44,000; award ed to T. R. Nickson & Company. Broadway, from Ontario to Prince Edward, Palmer Bros. & Henning, $53,612; M. P. Cotton, [illegible]; T. R. Nickson & Company, [illegible], awarded to T. R. Nickson & Company. Dunlevy avenue, from Hastings to Harris, Palmer Bros. & Henning, $22,611; M. P. Cotton, $24,335; awarded to Palmer Bros. & Henning. Sewers—Tenth avenue sewer, M. P. Cotton, $64,000; J. C. Kennedy, $32,000; H. McDonald, $53,232; Palmer Bros. & Henning, $59,475; W. D. Grant, [illegible].

Railroads, Bridges and Wharves

Calgary, Alta.
The proposed extensions to the street railway include several large concrete and steel bridges. Estimates passed provide for an expenditure of over $250,000 for the work.

Colchester, Ont.
Tenders are being called by the Public Works Department for extension to pier here. Plans, etc., at offices of H. J. Lamb, district engineer, London; J. G. Sing, district engineer, Toronto, and on application to local post-master.

Fort George, B.C.
A route map of the proposed line of railway from Edmonton to this place has been filed for approval with the authorities at Ottawa, as compiled by the Pine Pass Railway Company.

Headingly, Man.
There is a movement on foot to build a $40,000 vehicle and passenger bridge from West Winnipeg over the Assiniboine river.

Laprairie, Que.
Work will shortly be commenced on improvements at this point, to include construction of new quay, estimated cost $8,000; raising river road between St. Lambert and Laprairie, estimated cost $30,000.

North Vancouver, B.C.
The City Council has decided to invest $100,000 in the Second Narrows bridge.

Penticton, B.C.
A wharf will be built here, 900 feet long, at a cost of $20,000.

St. Vincent de Paul, Que.
The residents of this community are petitioning the Dominion Government to construct a bridge across the Riviere de Prairie opposite this town.

Sydney, N.S.
The ratepayers will vote on the proposition to borrow $10,000 for the installing of a subway at McQuarrie's crossing. James J. Curry, city clerk.

Toronto, Ont.
The G. T. R. have made preliminary arrangements for depression of tracks from Bathurst street to Sunnyside, which will entail, it is estimated, about $500,000.

Victoria, B.C.
Plans for the bridge to span Fraser river at Pennys are now in preparation by the Government. Estimated expenditure, $30,000.

Winnipeg, Man.
The city of Winnipeg is securing estimates on the cost of constructing a subway beneath the C. P. R. yards at Salter street. It was planned to reconstruct the overhead bridge at this point, but should the figures of the city engineer recommend the subway it will take the place of the bridge. If constructed the tunnel would be almost half a mile in length.

AWARDED.

Kingston, Ont.
The Ontario Bridge Company was awarded the contract for rebuilding the Cataraqui bridge (110 feet), lowest tender.

Levis, Que.
The Department of Public Works, Ottawa, has accepted the tender of Mr. Horace Dussault for the construction of a wharf, $283,064.

Ottawa, Ont.
The following contracts have been awarded by the Department of Public Works: Extension to Kingsport, N.S., pier, H. McAloney, Parrsboro, N.S.; wharf extension at Sault Ste. Marie, Ont., J. F. Boyd, Sault Ste. Marie, Ont.; wharf construction at Angers, Que., J. H. and R. H. Murphy; and wharf extension at Maria, Que., Peter Nadeau & Sons, Grand Caspedia, Que.

Public Buildings, Churches, Schools, etc.

Bladworth, Sask.
A new public school, costing $8,500, is to be built.

Brantford, Ont.
It is announced that a new Children's Shelter will be erected. $7,000 is now available.

Belleville, Ont.
The amount of $41,342 was raised for erection of new Y. M. C. A. building, which was over the amount aimed at.

Beaverton, Ont.
Tenders will be received up to July 26 for the supplying and installing of a system of steam and hot air heating for a new town hall in Beaverton, Ont. L. J. Cameron, chairman of Building Committee. For further particulars see "Tenders and For Sale Department" of this issue.

Calgary, Alta.
The ratepayers on July 28th will vote on a bylaw to raise $61,000 for exhibition buildings.

Chatham, Ont.
The Knights of Columbus will erect a hall here. Estimated expenditure, $25,000.

Cloverdale, B.C.
Tenders addressed to C. N. Clow, architect, New Westminster, will be received until July 29th for erection of 4-room school. Plans, etc., at offices of the above mentioned, also at office of R. E. McBride, road superintendent, 39 Fairfield block, Vancouver, and at office of D. Haddon, this place.

Campbellton, N.B.
The following public buildings are reported to have been burned in the recent fire: Opera house, telegraph and telephone offices; Presbyterian and Baptist churches.

Edmonton, Alta.
Tenders were called until the 15th inst. for alterations and additions to City Hall; also for erection of fire hall on First street. Specifications at Builders' Exchange and at the office of architect James Henderson, 42 Jasper west.

Enfield, Ont.
Tenders are being called until August 8th for the erection of brick school house, S. S. No. 15, township of Darlington. Plans, etc., at Mr. A. Ormiston's. R. Pascoe, secretary.

Grand Valley, Ont.
Tenders addressed to M. G. Varcoe, chairman Public School Board, will be received until July 23rd for the work required in the additions and alterations to the school here. Plans, etc., at office of secretary-treasurer, W. McIntyre.

Guelph, Ont.
It is announced that the Ontario Government will erect a residence for the Agricultural College here.

Gretna, Man.
Over $12,000 will be expended on the new public school, for which tenders have been called.

Grand Forks, B.C.
W. King, of Revelstoke, is preparing plans for the new provincial public buildings here and at Kaslo.

Humboldt, Sask.
The by-law for new fire hall and town hall, $25,000, was defeated.

Hamilton, Ont.
The Library Board has accepted the plans of Mr. A. W. Peene for the new Carnegie library.

Halifax, N.S.
Architects all over Canada will be asked to send in designs for the Memorial Tower, donated by Sir Sandford Fleming, Ottawa, to be erected.

Langham, Sask.
An addition is to be built at once to the Flowery Dale School. O. E. Simonson, secretary.

Miniota, Man.
Tenders were taken to July 7 for erection of a Council Hall. Jas. Boyce, Miniota.

Moose Jaw, Sask.
Tenders for the isolation hospital were received ranging from $14,786 inclusive down to $11,350 exclusive of heating and plumbing.

Tenders addressed to W. F. Heal, city clerk, will be received until July 25th for erection of market building. Plans, etc., at office of W. Zimmerman, architect.

Mortlach, Sask.
Tenders were called until the 20th of July for erection of Church of England. A. Cooper, secretary, Building Committee.

Moncton, N.B.
R. A. Frechett, architect, is preparing plans for the following:—Roman Catholic churches at St. Bernard, Digby County, N.S., steel structure of slate, stone and granite base, almost 251 x 76 feet; at Neguas, N.B., a stone building, 150 x 66 feet, with basement; at Socuminec, N.B., a stone building, 130 x 57 feet.

Magog, Que.
Tenders are being called until July 25th by Public Works Department for Armory fittings in public building here. Plans, etc., on application to Mr. Lacasse, caretaker public building here, or at the above Department.

Montreal, Que.
A project to remodel the main entrance of the City Hall is mooted.

Permit was issued to General Hospital, Dorchester street east, for building, $435,000.

Plans for the new Y. M. C. A. buildings are nearing completion and tenders will shortly be called for the erection of a central Y. M. C. A., Drummond street, and

Extension to the Civic Library are being discussed at the present time.

also for those in Westmount and Fairmount. Messrs. Ross & McFarlane, architects.

Nelson, B.C.

Damage to the extent of about $6,000 was done to the Government stock quarantine station on the 6th inst.

Nanaimo, B.C.

Ste. Anne's convent and residence of Rev. Father Heymen were destroyed by fire on the 12th inst. Total estimated loss, $30,000.

New Westminster, B.C.

The congregation of the Sixth Avenue Methodist Church have decided to build at once. A lot has been secured on Sixth avenue. The total cost is estimated at $10,000.

North Vancouver, B.C.

Tenders closed on the 18th July for erection of new school in North Lonsdale. Plans, etc., at office of G. Campbell, secretary, or at office of Hope & Barker, architects, 603 Hastings street, Vancouver.

North Toronto, Ont.

The Public School Board appointed Mr. Forsey P. Page architect to prepare plans and specifications and to oversee the construction of the proposed new school at Bedford Park.

Ottawa, Ont.

Tenders were called until July 14th for electric light fittings for the Registry Office. Specifications at office of J. A. Ewart, architect, 193 Sparks street. J. Henderson, city clerk.

J. B. Lamb and W. A. Lamb have started a warehouse on Queen street to be occupied by the Dominion Analyst. It will cost about $10,000. C. J. Meredith is architect. T. C. James has the masonry, and W. G. Adamson the carpentering work.

Phoenix, B.C.

We are informed that A. Wilkie is the architect in charge of the new school to be erected here. Noted in issue of July 6th.

Prince Albert, Sask.

The council are looking for a site for a new city hall, which will probably not be erected for some time.

Regina, Sask.

Fraser & Hutchinson, architects, have plans for a 4-room brick school.

Plans and sketches for a group of buildings to form the Methodist College at Regina are being prepared by Messrs. Brown & Vallance, Montreal, Que. This is the college project towards which the Massey Estate recently made a large contribution. It is expected that construction work on several of the buildings will be commenced next spring.

Stewart, B.C.

The Presbyterians will erect an institutional church here in the near future. Dr. Richards, chairman board of management; Mr. Vaughan, secretary.

St. Charles, Man.

A new municipal hall is to be erected. Frank Ness, secretary.

St. John, N.B.

The question regarding the erection of school on Weldon lot, for which authority was obtained to issue $40,000 debentures, was referred to a building committee and architect with instructions to report after plans and specifications had been modified somewhat.

Tenders will be called shortly for steel ceiling in court house; also for painting and wiring the same. Councillor McGoldrick, chairman, building committee.

St. Lambert, Que.

It is expected that work will be commenced this season on the construction of new post office for St. Lambert.

Saskatoon, Sask.

Plans and specifications have been prepared and tenders are being received for the erection of Anglican College for University of Saskatchewan; and also for principal's residence in connection therewith. Brown & Vallance, architects, Montreal, Que.

Toronto, Ont.

Sufficient funds ($7,000) has been raised for the construction of the Sunday school hall for the Chester Baptist church. Work will commence on the return of the pastor, Rev. Juson McIntosh, next month.

Permit was granted to the Reformed Presbyterian Church for new edifice on Bloor street east, near Sherbourne street, at a cost of $12,000.

The time for receiving plans in the competition for designs for the new Government House has been extended to August 10.

Virden, Man.

Tenders addressed to A. W. H. Smith, secretary-treasurer, will be received until July 26th for erection of collegiate. Plans, etc., with V. W. Horwood, architect, Winnipeg.

Vancouver, B.C.

A 10-storey building is planned by the Salvation Army in this city. Colonel Turner of Toronto has charge of the financial arrangements.

Victoria, B.C.

The women's auxiliary of Jubilee Hospital recommend strongly the remodelling of the hospital. Secretary-treasurer, Mrs. Hasell.

The school board will appeal to the ratepayers in a short time for the sum of $45,000 for school purposes, which will be expended as follows: $20,000 on the necessary extension of the Victoria West school; $20,000 for the erection of a school on the Bank street site purchased last year, and $5,000 for additions to the Kingston street school.

Tentative plans have been prepared for the new isolation hospital, and the by-law providing for the expenditure will be submitted to the ratepayers at the earliest possible date.

Tenders for heating office annex, Parliament buildings, will be received until July 21st. F. C. Gamble, public works engineer.

All Souls' Unitarian Church have secured a building site corner Buell and Furby streets.

Winnipeg, Man.

Plans are being prepared for an addition to St. Alban's Anglican Church.

The Icelandic Lutheran Synod are considering the erection of a church school or academy.

The Trades and Labor Council have plans for a new labor temple.

The Evangelical German Lutheran congregation of Ohio at its recent meeting of Synod advocated a college being erected in Saskatchewan.

Tenders are being called for by J. H. G. Russell, for the construction of a children's hospital on north Main street.

The city of Winnipeg will call for tenders after the 18th inst. for construction of two police sub-stations, to be identical in construction; two storeys and basement; of solid brick construction. Building Inspector Rodgers has the specifications. The police patrol and signal station, addition to the present police station, will also be tendered upon within a week. This building will be either three or four storeys in height, but the dimensions are not definitely settled.

AWARDED.

Belleville, Ont.

Messrs. Thompson Bros. of this city were awarded the contract for addition and improvements to hospital at $28,000.

Canning, N.S.

We are informed that contract for construction of the Baptist church building has been given to A. W. Allin & Sons, of Middleton, N.S., for $6,400. This does not include foundation, plumbing, seating, heating and lighting. The structure complete will cost $8,000.

Fort William, Ont.

The contract to install drinking fountains in the Central, Franklin, Isabella and Francis schools was let to the Superior Heating & Plumbing Company. The contract was awarded to A. W. Churcher for painting and kalsomining the several schools; to Alex. Cameron for plumbing in the Central School.

Montreal, Que.

The general contract for additions to the Church of Ascension, Park avenue, has been awarded to Messrs. Sparrow & McNeil. Mr. H. C. Stone, architect.

The general contract for the erection of a school building on Latournel street, Maisonneuve, for the Board of Catholic School Commissioners, have been awarded to Jos. Trudel, steel contract awarded to Phoenix Bridge Company.

The Council of Montreal West have awarded the general contract of new town hall building to Messrs. Reid, McGregor & Reid. Sub-contracts have been awarded as follows: carpentering, D. F. Deslauriers; roofing, G. W. Reed & Company; plumbing and heating, Dominion Camp Equipment Company; lathing and plastering, R. D. Clark & Son; artificial stone work, T. A. Morrison & Company, representing Roman Stone Company; steel work, Structural Steel Company. Architects, Messrs. Peden & McLaren.

Contracts have been awarded as follows in connection with the erection of the First Presbyterian Church: Tiling, J. H. Ward; steel work, Structural Steel Company; concrete work, Church, Ross & Company; roofing, Richardson, Simard & Company; carpentering, D. M. Long; plastering, R. G. Hamilton; painting and glazing, W. E. Potter; electric wiring, Collyer & Brock; plumbing and heating, Alex. MacKay. Architects, Messrs. Peden & McLaren.

North Battleford, Sask.

T. J. Brocklebank, of Melville, Sask, got the contract for the new school at $13,700. The Alberta Construction Company's figure was $14,440, and P. D. Laird & Son's, $15,300.

Owen Sound, Ont.

The contract for the brick, stone, concrete work and excavation in connection with annex to General Hospital has been awarded to Messrs. Middlebro & Cruikshank, the carpentry to A. Greene. Estimated cost, $30,000.

Ottawa, Ont.

The contracts have been awarded for the Bell Street Methodist Church. George Craig gets the masonry and brick work; McCreadie & Company, the carpentering. Estimated cost, about $25,000. Mr. J. P. Maclaren is architect.

The alterations in the Water street ho

pital contract has been awarded to Joseph Photo Company, Montreal. W. E. Noffke is architect. The alterations will cost $12,000.

Rosthern, Sask.

Henry Wegener secured the contract to erect the new frame school house at Laird, Sask.

Stewart, B.C.

Mr. James Cummins has secured the contract for the building of the $4,000 court house and government office building.

Toronto, Ont.

Tenders for the new fire hall to be erected on Main street were awarded as follows: Masonry, Page & Company, $14,195; carpentering, M. Hutchinson, $6,380; heating, W. Schulkins, $1,300; plumbing, J. E. Gray, $745; electric wiring, W. J. McGuire, $330; roofing, Reggin & Spence, $668; plastering, A. Petrie & Company, $1,110; painting and glazing, John Faircloth, $560; total, $25,238.

The contracts for the new central lighting and heating plant for the University of Toronto have been awarded as follows: L. K. Comstock, New York, were given the erection of power house and building of tunnels, and supplying of some of the machinery; contract for boiler was awarded to Babcock & Wilcox, Glasgow; W. J. McGuire, Toronto, was given the contract for heating mains. Darling & Pearson, architects.

Waskada, Man.

We are informed that the contract for municipal building was awarded to D. McLean, contractor, Waskada, at $2,614. S. Robinson, Waskada, tendered at $2,700.

Woodstock, Ont.

Contract for heating and ventilating the two new schools has been awarded to Mr. E. S. Coppins at the following prices:—For Princess (Beale St.) School, $2,163, plus $385 for the fan and motor, and for Victoria (Delatre St.) $1,857, plus $350 for fan, totalling $4,755.

Winnipeg, Man.

Board of Education awarded contracts as follows: The work of renovating the plumbing of Balaclava street school, James Williams, for $412; the figures of other tenderers were: E. B. Dixon, $582; Hamilton & Stott, $425; C. Bull, $454, and Ingram & Davey, $418. The successful tenderers for the work at Manitoba street school were as follows: Masonry work, George A. Ponsford; carpenter work, A. Morris, $3.90; plumbing, J. Williams, $295. There were several tenderers for the plumbing, these being: E. B. Dixon, $416; Hamilton & Stott, $375; C. Bull, $341.12; Ingram & Davey, $545. Architect Darrach.

J. H. G. Russell has awarded the contract for excavation for new Westminster Church, corner Maryland and Buell streets, to G. H. Vincent. The total cost of the church and school will be near $150,000. Local stone will be used.

Business Buildings and Industrial Plants

Borden, Sask.

The Board of Trade are asking the Northern Crown Bank to build at once or they will secure another bank for the town. An elevator is also needed.

Brandon, Man.

McCabe & Company's elevator at Beverley, 30 miles south of here on the Great Northern, was completely destroyed by fire on Saturday night. The loss is about $25,000.

Tenders will be called for next Wednesday for the construction of the Canadian Northern Railway's new combined depot and hotel at Brandon. Ralph Pratt, of Pratt & Ross, Winnipeg, is the architect.

Campbellton, N.B.

In the recent fire here the following companies are reported to have lost as follows: The Shives Company, $100,000; McLennan Foundry Company, $30,000; total Intercolonial Railway loss, about $100,000; Richards shingle mill, $30,000; Harquail Woodworking Company, $40,000.

Paul Lea Company, Limited, of Moncton, N.B., who own a large woodworking factory there, intend erecting a branch warehouse at Campbellton, N.B., to meet the demand which will be occasioned by the recent fire.

Chatham, N.B.

The plant of the Miramichi Pulp & Paper Company was damaged to the extent of about $3,000 on the 12th inst.

Carlstadt, Alta.

The Union Bank will have a 2-storey building erected here at once.

Calgary, Alta.

It is stated that work will be commenced on the combined depot and hotel of the C. N. R. within the next fifty days.

Tenders are called until July 21st for erection of 6-storey brick and reinforced concrete hotel. Burroughs & Richards, architects, Crown Building.

The Alberta Pacific Elevator Company will build nine more elevators in Alberta at once. A. A. Smith is building superintendent.

Fort William, Ont.

Tenders for heating and plumbing will be received until July 22nd, Enzer block; also Frodsahm block. Hood & Scott, architects.

Harcourt, N.B.

On the 9th inst. the factory at Mortimore, belonging to the Miller Tanning & Extract Company, was completely destroyed by fire. Estimated loss, $20,000.

Hamilton, Ont.

The Oliver Chilled Plough Company is asking for tenders for the following: forge building, 514 x 100 feet; machine shop, 200 x 70 feet; dock, 800 x 100 feet.

Kamloops, B.C.

Fire destroyed the warehouse of S. C. Allan, and other buildings. Total estimated loss, $75,000.

London, Ont.

Wilson & Son, architects, Chatham, Ont., are preparing plans for the new Watt threshing machine factory, 300 feet in circumference. Drawings have also been prepared by the same architects for a suite of offices for the Sydenham Glass Company, of Wallaceburg.

Lachine, Que.

The construction of a factory for the manufacture of illuminating gas is under way. Messrs. D. A. Decary, K.C., and Alderman LePailleur are interested. $30,000 are to be expended.

The Canadian Railway Signal Company, Limited, is erecting an extensive factory corner of Broadway and Twentieth avenue, and will occupy a lot 250 x 60 feet. A substantial building of reinforced concrete will be put up, and with the plant it is expected over $100,000 will be invested.

Lakefield, Ont.

The grain warehouse and coal sheds of Charlton Bros. were destroyed by fire on the 17th inst. The loss is $10,000. The building was owned by the Dixon Company, of Peterboro.

Laprairie, Que.

The St. Lawrence Brick Company, capitalized at $300,000, are preparing to commence operations in this town. Kilns will shortly be constructed and machinery installed.

Mahone Bay, N.S.

Dumaresq & Cobb, architects, Halifax, are preparing plans for a new building for the Bank of Montreal here.

Moose Jaw, Sask.

Gordon Ironsides Company, it is stated, will have larger plant than at first planned; $100,000 to be spent in buildings this year.

Moncton, N.B.

Mr. Whelpley, of Greenwich, Kings County, has consulted with the council as to the location of a skate factory here. Ald. W. G. Jones, chairman Industrial and Advertising Committee.

Montreal, Que.

Tenders will be received until July 23rd for the erection of a store building for Mr. Jno. Allan. Messrs. Ross & McFarlane, architects.

Permits were issued to C. P. R. Company for additions to Place Viger Hotel, to cost $200,000; also for new Windsor station, $1,250,000; also to Dominion Express Company, office building, $600,000.

Tenders will be received until Saturday, July 23rd for the general construction of the Windsor street station. W. S. Painter, architect.

Tenders will be received until Monday, July 25th, for the construction of an extensive 1-storey car shop building for the Montreal Street Railway Company. Messrs. Marchand & Haskell, architects.

Mr. Carl Rosenberg has purchased the premises at the southwest corner of St. Lawrence boulevard and Ontario street with a total frontage of 180 feet. It is stated that a new six storey office and commercial building will be erected on this property.

Fire completely destroyed the Victoriaville chair factory on the 16th inst. The loss was $30,000.

Nelson, B.C.

The Kreyscher shingle mill, and Kootenay engineering plant were destroyed by fire on the 6th inst. Losses respectively, $5,000 and $20,000.

Owen Sound, Ont.

Fire did damage to the extent of about $10,000 to the factories of the Keenan Woodenware Company here.

A million dollar drydock, shipbuilding and repairing plant for Owen Sound is a proposition on which in August the ratepayers are to be asked to vote fifty thousand dollars bonus and fifty thousand dollars investment in stock towards the shipbuilding plant. Mentioned in our issue of June 1st.

Ottawa, Ont.

Permit has been issued for the new factory for the Continental Bag & Paper Company. The building will be of solid brick, two storeys high, and will be 121 by 82 feet. Cost, $30,000.

A. H. Caplan & Company, Limited, have decided to establish a 3-storey babbit metal and solder foundry on Queen street, together with a smelting and refining plant. Cement blocks will be used. Work will start at once.

Portage la Prairie, Man.
The Bank of Commerce are considering an addition to their building.

Port Arthur, Ont.
F. S. Wiley, manager of Tudhope & Lindsay, says the new wagon works will be erected at once.

Prince Albert, Sask.
Architect Albrechtson has completed plans for Pollock's new three-storey block.

Among the proposed new business blocks are one for T. E. Baker, one for Contractor Ittner, and another for Wm. Knox. T. D. Agnew and J. H. Pollock also contemplate building.

Regina, Sask.
The Imperial Oil Company is to have a $12,000 extension made to their warehouse.

The Farmer's Co-Operative Company, Limited, have purchased four lots on which to erect a warehouse. W. J. Traynor, of Davidson, Sask., is manager and secretary.

The re-organized Sawyer & Massey Company, manufacturers of engines and threshers, at Hamilton, Ont., and capitalized at $7,000,000, have decided to establish their provincial headquarters here. G. Kirkland, manager. R. Harmer, president.

Saskatoon, Sask.
Brown & Brown, Montreal, are the architects for the $70,000 addition to J. F. Cairns' store here.

St. Thomas, Ont.
Architect N. R. Darrach has prepared plans for the additions and alterations to the Red Foundry (extension to Norseworthy Company's foundry). The plans provide for the erection of a brick building, 60 x 110 feet.

St. Catharines, Ont.
An additional 2-storey brick building, 92 x 115 feet, will be built to the Reo Motor Car Company's factory at once. J. H. Thompson, Lansing, Mich., secretary-treasurer; J. P. Fillingham, local manager.

Toronto, Ont.
It is understood that a large warehouse will be erected at 50 Richmond street, recently sold by Goulding & Hamilton.

Vancouver, B.C.
Messrs. Parks & McDonald will build on their property on Pender street adjoining the site of the 4-storey building to be erected by Hon. F. Carter-Cotton. Mr. E. K. Silver, owner of the property adjoining McLennan & Campbell block, has plans for a 4-storey building.

Permits were issued recently for warehouses to Gray Bros. for a three-storey block corner of Homer and Davie, $56,000; and to W. R. Arnold, for four storey structure of the reinforced concrete type on Homer street, $48,000.

Winnipeg, Man.
A company is being formed to erect a summer hotel at the G. T. P. crossing of the Winnipeg river.

Tenders are wanted for all trades (except heating) for erection of business block on Pacific avenue for R. & J. Johnston. F. R. Evans, architect.

The site corner of Main and Rupert is to be cleared and five stores pulled down for McLaren Bros.' new hotel. Noted in issue of June 8.

Permit was issued during the week to Wilson Stationery Company, printing house, Gertie street, between McDermott and Notre Dame, $35,000.

Tenders addressed to the Engineering Department, Manitoba Elevator Commission, will be received until July 23rd for supply of following materials: gasoline engines, dump scale, bushel hopper scale, etc.

AWARDED.

Brandon, Man.
Wm. Bell was awarded the contract for the erection of the warehouse for Cockshutt Plow Company, of which J. C. B. Inkster is local manager. Estimated cost, $25,000.

Fort William, Ont.
The G. T. P. have awarded to Carter-Halls-Aldinger Company, of Winnipeg, the contract for their roundhouse and machine shops on the Mission. The buildings will cost about $100,000.

Holden, Alta.
The Prairie Lumber Company secured the contract to build a new elevator here.

Ottawa, Ont.
The excavation is nearly completed for the new Hope building, which will be nine storeys high and cost about $100,000. Mr. W. E. Noffke is the architect. Holbrook & Sutherland have the contract for the masonry, brick and fireproof work, Alex. Christie the carpentering, and Charles Hunt the plastering. Otis-Fensom Elevator Company has the contract for the elevator.

Suffield, Alta.
W. White has been awarded contract to build a 35-room hotel here.

Vancouver, B.C.
British Columbia Telephone Company has awarded the contract for a central exchange building in North Vancouver to McDonald & Wilson. Pressed brick and stone will be used on the frontage.

The contract for the construction of a five storey warehouse for Joseph Brown on Princess street, has been let in two sections to A. Gray and W. J. Davidson.

F. R. Evans, architect, has awarded the contract for the construction of a warehouse and sample rooms on Pacific avenue to A. J. Bonnett, of Winnipeg, at $27,000. This building will be two storeys in height.

Residences

Halifax, N.S.
Dumaresq & Cobb, architects, are preparing plans for residence Towel Road for Mr. A. L. Melvin.

Hamilton, Ont.
Permits were issued to Sam Easter, brick dwelling, Fairleigh avenue, for Fred Elems, $2,500; W. H. Northcott, brick dwelling, Orchard Hill, $2,500.

Moncton, N.B.
W. C. Barnes, architect, is preparing plans and specifications for a two and a half storey residence for Dr. F. A. Taylor.

Montreal, Que.
Tenders have been received for the erection of a residence on Cedar avenue for Mr. A. McFarlane. Messrs. Saxe & Archibald, architects.

North Battleford, Sask.
The Roman Catholic Church will have a rectory built at once. Rev. J. Paille is in charge.

New Westminster, B.C.
Arrangements are being perfected by Dr. A. D. Buchanan for the erection of a modern apartment house at the corner of Tenth street and Queens avenue, to cost about $50,000.

Ottawa, Ont.
Weeks & Keefer, architects, are calling for tenders for a residence on Carling avenue for Dr. J. E. Taggart. Estimated cost, $10,000.

Sydney, N.S.
Building Contractor F. L. Dixon has a permit for the construction of a residence for Mr. Geo. J. Ross on Whitney avenue, to cost $5,000.

Victoria, B.C.
Building permits have been issued to S. E. Matthews for a dwelling on Pendergast street, $2,500; to the Victoria waterworks department for a caretaker's dwelling at the Smith's Hill reservoir, $2,500; S. Millington, dwelling, Linden avenue, $3,000; T. A. Johnston, dwelling, Richardson street, $4,000; L. S. V. York, dwelling, Cook street, $3,000.

Winnipeg, Man.
Recent building permits include: J. A. Machray, house, southeast corner of Nassau and River avenue, $12,000; the Hall Company, Limited, three houses, east side of Arlington street, between Ellice and Sargent, $10,000; H. McKinney, two houses north side of Machray, opposite Sinclair, $3,200; F. Weichen, house, north side of St. John's, between Powers and Andrews, $2,600; J. A. McDiarmid, house, north side of McMillan, $3,500; A. Macaw, house, south side of Grosvenor, $5,000.

AWARDED.

Dauphin, Man.
Hafenbrak & Steen secured the contract to erect a fine residence for Adam Justice.

Halifax, N.S.
Dumaresq & Cobb, architects, have awarded the contract for Mr. R. Forrester Macintosh's new residence, Pleasant street, to S. M. Brookfield, Limited.

Montreal, Que.
General contract for the erection of two houses on Ontario avenue for G. A. Grier, Esq., has been awarded to John Stewart & Company, general contractors, 153 Hillside avenue, Westmount. Architects, G. Kenneth Rea, 54a Beaver Hall Hill.

Contract for the plumbing and heating of two houses on Drummond street for the Natural History Society has been awarded to John A. Gordon, 301 St. Antoine street. Architects, Hogle & Davis, 80 St. Francois Xavier street.

Contracts have been awarded as follows for the erection of a residence at Lachine for Robert Lucas: Masonry and brick work, John Wighton; carpentering, J. B. Pauze & Son. Mr. H. C. Stone, architect.

Contract for alterations and additions to residence of H. S. Holt, Stanley street, has been awarded to Chas. Thackery & Company. Mr. H. C. Stone, architect.

Ottawa, Ont.
N. D. Porter is making extensive changes to the Burlridge residence, James Robertson has contract for masonry, R. Holmes for carpentering work.

The residence of Russell Blackburn, corner of Lisgar and Cartier street is being entirely renovated. Smith Brothers have the contract. Joseph S. Irwin's residence, corner of Cartier and Maclaren, is also being altered. Mr. Alex. Christie has the carpentering work and T. C. James the masonry. W. E. Noffke is architect for both houses.

Victoria, B.C.
Contract for the construction of a $[illegible],000 residence on St. Charles street for Mr. [illegible] Benneck & Sons by P. L. James, the architect.

Tenders and For Sale Department

Tenders for Pavement

Sealed tenders will be received by the Town Engineer of the Town of Collingwood until noon, on SATURDAY, JULY 30TH, 1910, for approximately [illegible] square yards of Street Paving. Tenders will be received for either Brick or Bituminous Paving on a concrete base. All tenders must be accompanied by an accepted cheque for 2 per cent of the amount of the tender.

Plans and specifications can be seen at the office of the undersigned. Lowest or any tender not necessarily accepted.

K. S. MACDONELL,
Town Engineer.

29

Tenders Wanted

Sealed tenders will be received by the undersigned up to 1 o'clock p.m. on WEDNESDAY, JULY 27th, 1910, for the construction of a drain in the Township of Minto, known as Municipal Drain No. 3.

The work consists of the excavation of a new drain in places and the deepening and widening of a drain or ditch already constructed, and deepening and straightening of a creek or watercourse, in all 35,000 feet in length. The work is divided into three sections and tenders will be received for one or all the sections.

Plans and specifications may be seen at the office of the undersigned, and forms of tender may be had on application.

W. D. McLELLAN,
Clerk of Minto,
Harriston, P. O.

29

Department of Railways and Canals, Canada

Hudson Bay Railway

Saskatchewan Bridge

Notice to Contractors

Sealed tenders, addressed to the undersigned, and endorsed "Tender for substructure of Le Pas Bridge," will be received until 16 o'clock on MONDAY, JULY 25, 1910

Plans, specifications and form of contract to be entered into, can be seen on and after this date, at office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer, Hudson Bay Railway, at Winnipeg, Man., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000.00 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals.
Ottawa, July 2, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 29

Tenders for

Pumping Engine

Tenders will be received by the undersigned up to AUGUST 1ST, NEXT, for a Compound Duplex Pumping Engine, capable of pumping two million imperial gallons per day, against a head of 125 pounds per square inch. A second-hand pump will also be considered.

For further information apply to

H. HYMMEN,
Superintendent Berlin Waterworks.

Berlin, Ont., July 13th, 1910. 30

Town of Beaverton

Province of Ontario

Sealed tenders addressed to the undersigned will be received up till 12 o'clock noon, JULY 26TH, for the supplying and installing of a System of Steam and Hot Air Heating for a new Town Hall in the Village of Beaverton; also sealed tenders addressed to the undersigned will be received up till 12 o'clock noon of AUGUST 10TH for the Electric Wiring of the above Town Hall.

Specifications for the above and forms of tender can be seen at the offices of W. Fletcher Sheppard and J. Harvey Self, Associated Architects, 436 Yonge street, Toronto, or John McArthur, Town Hall, Beaverton.

Firms tendering for the above heating will be given an opportunity of explaining their system before the committee on the evening of July 26th.

A marked cheque for $50 payable to the order of L. J. Cameron must accompany each tender, and will be retained as security for immediate execution of a construction contract and satisfactory guarantee bond.

Deposit cheque of tenderers will be returned if unsuccessful, or if successful, on execution of construction contract and guarantee bond.

The lowest or any tender not necessarily accepted.

L. J. CAMERON,
Chairman Building Committee.

Beaverton, Ont., July 12th, 1910. 29

City of Winnipeg Electrical Distribution System

Tenders for

Underground Cable

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope "City of Winnipeg Electrical Distribution System, Tender for Cable," will be received at the office of the undersigned up to noon on THURSDAY, SEPTEMBER 1ST, 1910, for the manufacture, delivery and installation, 46,000 feet of thirteen thousand volt, three-core cable.

Copies of the specifications and form of tender may be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg.

These specifications may also be examined at the offices of Messrs. Smith, Kerry and Chace, Confederation Life Building, Toronto, Ontario.

Each tender must be accompanied by a certified cheque for one thousand dollars, which cheque will become forfeit to the corporation in the event of the successful tenderer refusing or neglecting to sign a satisfactory contract when called upon so to do.

The city reserves the right to reject any or all tenders or to accept any bid which shall appear advantageous.

M. PETERSON,
Secretary.

Board of Control Office,
Winnipeg, July 15th, 1910. 31

FOR SALE

Kelly Steam Pump Horizontal Cross Compound, in good condition, capacity 2,000,000 imperial gallons, must be removed to make room for electric equipment. Inquire the Water Commissioners, London, Ontario. 31

TO CONTRACTORS

Sealed bids will be received by the undersigned up to noon, FRIDAY, JULY 29TH, for all trades required in the erection of a residence in Whitney avenue, Rosedale.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
Traders Bank Building, Toronto.

30

Tenders

For Steel Bridges and Concrete Abutments

Tenders will be received by the undersigned up to twelve o'clock noon, WEDNESDAY, JULY 27TH, 1910, for the construction of a Steel Superstructure, 55 feet clear span, and Concrete Abutments for a Bridge over the Black River between the Counties of York and Ontario, Lot 31, East Gwillinbury.

Plans and specifications may be seen and all necessary information may be obtained at the offices of the undersigned, 57 Adelaide street east, Toronto.

The lowest or any tender not necessarily accepted.

BARBER & YOUNG.
Engineers.

Toronto, July 18th, 1910. 29

Sheet Piling on the Diversion of the Don River

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, JULY 26TH, 1910, for the construction of sheet piling on the west bank of the River Don from the south line of the Grand Trunk Railway bridge southerly for a distance of 283 feet across the present river.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer), not members of the City Council, or officers of the Corporation of the City of Toronto, or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The usual conditions relating to tendering as prescribed by City By-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman Board of Control.

City Hall, Toronto, July 12, 1910. 29

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 inch x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

ARCHITECT'S ASSISTANT (30) desires permanent engagement in Western Canada or B.C: 14 years' sound English and Canadian experience. Excellent testimonials. Member Society of Architects. L. L. Pearson, 370 Aikins street, Winnipeg, Man. 29

Power Plants, Electricity and Telephones

Blyth, Ont.

Tenders for line materials and erection of telephone lines for the Blyth Telephone System will be called shortly. Full information can be secured from the secretary, Mr. A. Elder, this place.

Calgary, Alta.

The new branch of the street railway, for which estimates have been passed by the commissioners, will cost over $250,000.

The ratepayers will vote on a by-law on July 20th to raise $125,000 for the purpose of constructing, erecting and equipping a municipal electric power palnt.

Moose Jaw, Sask.

John Bocrae, consulting engineer, and Hector A. Dion, assistant engineer, Ottawa, Ont., will supervise the construction of the new electric street railway now being built. Noted previously.

Nanaimo, B.C.

The Dominion Stock & Bond Corporation, Vancouver, have offered to construct and operate a suburban street car line, the city guaranteeing the interest on the bonds. Invested capital about $400,000. G. H. Salmon, manager.

Seaforth, Ont.

The ratepayers on August 8 will vote on Hydro-Electric by-law for $25,000, to cover cost of power plant, and equipment for street and general lighting.

Stratford, Ont.

The Council of Waterloo Township has decided to submit to the ratepayers a by-law to take a $10,000 block of stock in the People's Railway Company on August 8th.

Victoria, B.C.

The by-law calling for the expenditure of some $75,000, to allow of the B. C. Electric Railway Company laying its wires underground, will shortly be submitted to the ratepayers.

Tenders for the cluster light standards and lights will be called for.

Winnipeg, Man.

Tenders addressed to the Chairman of Board of Control will be received until September 1st for the manufacture, delivery and installation of 16,000 feet of 13,000 volt, three-score cable. Copies of specifications obtained at the power engineer's office, this city, and also at offices of Messrs. Smith, Kerry & Chace, Toronto. M. Peterson, secretary.

AWARDED.

Brandon, Man.

The Brandon Electric Light Company let the contract for the laying of the mains for the big plant which is to furnish steam heating to the business portion of Brandon from the central station to A. E. Bullock.

London, Ont.

A contract was let for the laying of 90 miles of 12-inch gas pipes from Raleigh township near Rondeau to this city.

Toronto, Ont.

The contract for supply of aluminium wire per pound was awarded to Messrs. Parke & Leith, Toronto, at 22 cents per pound.

Vancouver, B.C.

The contract for installation of the ornamental lighting system on Granville street has been awarded to the Electrical Construction Company.

Miscellaneous

Montreal, Que.

Recent building permits include:— A. Beaulieu, 607 Mentana street, three houses containing eighteen dwellings, $9,000; C. Desjardins, 163 Laurier avenue, one house containing three dwellings, $3,000; Jos. Lauzon, 55 Dulford street, one house containing six dwellings, $3,200; V. Harnois, one house containing two dwellings, $2,500; C. E. Lamoureux, 171 Marquette, one house containing six dwellings, $5,000; S. H. Ewing, 100 Cote des Neiges street, two houses containing two dwellings, $12,000; J. A. Grier, factory building, $30,000; Dominion Tobacco Company, Papineau avenue, factory, $15,000; A. Giguere, 427 Charlevoix, one house containing two dwellings and one store, $3,000; J. Wolfe, 894 Nicolet, one house containing two dwellings, $4,000; Mrs. Cousineaux, 217 Hotel de Ville, two houses containing six dwellings, $3,500; F. Pare, one house containing three dwellings, $3,000; H. Lacrose, 211 Nicolet, three houses containing eight dwellings, $10,000.

Ottawa, Ont.

Tenders addressed to Board of Control will be received until July 26th for five fire alarm boxes of standard type, etc. J. Henderson, City Clerk.

Among the building permits issued during the past few days are: Victor Hall, warehouse, Wellington street, $3,000; A. M. McDiarmid, Melgund avenue, dwelling, $2,500; Mrs. C. Smith, dwelling on Center street, $2,000; Taylor & Lackey, Powell avenue, dwelling, $4,500; R. J. Devlin, store, Sparks street, $2,000; T. C. Clendennen, dwelling, First avenue, Geo. Earnow builder, $5,000; William Coots, Sweetland avenue, dwelling, $3,000; A. M. Mathe, cement dwelling, Church street, $2,700; W. J. Mills, factory, Slater street, Geo. Crain and J. and C. Low builders, $4,300; F. W. Forde, shops, Rideau street, Alex. Christie builder, $5,000; Jos. A. Acton, Second avenue, dwelling, $3,000,, R. E. McKinstry, builder; Ottawa Electric Company, transformer station and stables, Slater street, J. A. Ewart, architect, T. C. James and Thos. Shore builders, $18,000.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until July 26th for construction of sheet piling on the west bank of River Don, etc. Specifications at office of City Engineer.

Vancouver, B.C.

Permits granted recently are as follows: W. S. Hugo, 980 Dunsmuir street, $12,750; D. McKenzie, 1154 Burnaby street, $3,500; W. D. Ritchie, 2161 Sixth avenue west, $2,850; H. P. Newman, 1943 Keefer street, $3,000; H. O. Hatt & Company, 2737 St. Catherine street, three houses, $7,500; D. S. McDonald, 2225 Second avenue west, $6,000; A. F. McKinnon, 116 Fourteenth avenue west, two houses, $5,000.

AWARDED.

Welland, Ont.

J. W. Russell, of Toronto, has been awarded the contract for slightly widening the Welland canal at Welland, at $12,000.

New Companies

Canada Machinery Corporation, Toronto, Ont., Limited, capital of $3,000,000. The incorporators are: Harry Riley, law clerk; Joseph Edward Riley, accountant; Edward Gordon McMillan, law student; William Hamilton Walter, bookkeeper, and Thomas Wallace Lawson, solicitor, all of Toronto. The company proposes to make machinery, tools, etc.

Chillas, Black, Limited, Toronto, Ont., capital, $40,000, incorporated to deal in building supplies and fittings, etc. Incorporators: H. R. Chillas, S. W. Black, both of Toronto.

The Mechanical Equipment Company of Canada, Limited, Montreal, Que., capital $50,000, incorporated to carry on the business of mechanical engineers, boiler makers, etc. Incorporators, Stephen Davis, M.D., and Jos. Presner, civil engineer, both of Montreal, Que.

Business Notes

Buffalo Wire Goods Company, St. Paul, Que., J. McD. Hains, curator.

Dunbar Lumber Company, Limited, Elk Lake, Ontario, are stated to have assigned.

Strong and Murphy, Lumber merchants, Belle River, Ont., have sustained loss by fire.

F. J. Snider, saw mill proprietors, Bruce Mines, Ont., are stated to have assigned to A. Grigg.

La Compagnie de Telephone de Ste. Philomene de Fortierville, Que., have registered.

Frigon and Brien, painters, Montreal, Que., Joseph Frigon and Adrien Brien, registered.

In the Canada Gazette appears a notice of the incorporation at Montreal of the Canadian Development Company, with a capital of a million dollars. It is incorporated through Arnold Wainwright, advocate, to acquire and operate timber limits, mines, waterpowers, and real estate.

The British Columbia Gazette gives notice of the incorporation of the following companies: Princeton Waterworks Company, Limited, capital $25,000; The Bull River Electric Power Company, Limited, capital $2,000,000; Barkley Sound Power Company, Limited, capital $10,000; Prince Rupert Sheet Metal Works, Limited, capital $10,000; Bruce and Sweatman, Limited, incorporated to conduct and carry on a general engineering, contracting and construction business, etc., capital $20,000; The Pacific Coast Construction Company, Limited, capital $100,000; Imperial Power Company, Limited, capital $10,000; Newport Timber Company, Limited, capital $400,000; British Columbia Log Brokerage Company, capital $100,000; Cranbrook Sash and Door Factory, capital $100,000; Moose Jaw Electric Railway Company, Limited, capital $400,000; The Tulameen Power Company, Limited, capital $10,000; Portland Canal Lumber Company, Limited, capital [illegible]; Western [illegible] Company, Limited, capital $25,000.

The Patching of Macadamized Roads with a Special Type of Roller

The author has pleasure in submitting to the conference a few remarks on the system he has adopted for the repair of macadamized roads. He has long been of opinion that the systematic repair of roads by patching does not receive the attention its importance demands, and simple as the operation is, and notwithstanding its economy, it is not generally carried out in a scientific manner. It will probably not be denied that the patching of a road is desirable, although there may be a difference of opinion as to the extent to which the practice should be carried out. Some authorities appear to be satisfied with repairing holes, which become a source of danger, while others attempt patching by filling up the inequalities with loose material, leaving the traffic to either consolidate it or scatter is about, according to the state of the weather and the condition of the roads. The author's contention is that the patching of a road should commence immediately it begins to show any appreciable signs of wear, and that it should be regularly and systematically continued up to about the time when it becomes necessary to remacadamize the surface. The result of such a practice is, undoubtedly, not only to maintain a better surface, but to lengthen the periods for re-coating, and consequently, to reduce the cost of maintenance.

Adds 20 per cent. to Life of Road

The author's experience is that systematic patching generally adds something like 20 per cent. additional life to a road. For instance, a road on which patching is not properly carried out, and which usually requires re-coating once in five years, will, under the same conditions of traffic and with systematic patching, last at least six years.

The author believes that the main reason why the patching of roads is neglected is, that it is generally found impracticable with the plant available. It was certainly so in his case. He had charge of about 60 miles of macadamized town roads, for which two ordinary 10-ton steam rollers were provided. These rollers were usually employed on re-surfacing, and occasionally upon patching. But proper patching was found to be impracticable, especially during the summer months. Frequently, when it was most needed, the rollers were urgently required for other work; and when they could be spared they were found too unwieldy to properly carry out the repairs. Moreover, it was necessary that a roller should be accompanied by a water van and a horse and cart, and this was costly and inconvenient.

The author came to the conclusion that what was required was a special roller to be used almost entirely for patching purposes. Such a roller, it was thought, should be as capable of rolling in a patch and leaving it quite uniform with the adjoining surface. It should be small and compact in order to be as little conspicuous in the streets as possible. It should be capable of being quickly and easily reversed, in order that small patches could be consolidated quickly. It should be heavy enough to carry out any work which could be generally done by a 10-ton roller, and at the same time should be capable of being lightened for working on roads, where a heavy roller would be a disadvantage. It should carry at least 200 gallons of water in order to avoid the necessity of a water cart.

A Satisfactory Type of Roller

All these conditions are embodied in the roller which the author now uses for patching purposes. It is about 12 feet long and 5 feet 6 inches wide over all. The rolling wheel is 3 feet wide, and can be weighted from about 5 tons to 9 tons, according to the work it is required to do. The driver and two men are employed with the roller, and they are kept almost exclusively engaged on patching. They leave the depot each morning with about three tons of road metal and binding material, and when this is exhausted the roller travels back for a further quantity. It is surprising to find how small a quantity of stone is required to maintain an even surface to a road if the repairs are not neglected. The best time for patching is after a fall of rain, but if the work is to be successful it must be carried out continuously, except, of course, in frosty weather. When a road about to be patched is in a dry condition, water is sprayed on to the surface from the tank carried by the roller, and the smallest of holes are then detected. Each hole is picked over in order to loosen the old crust. The patching and binding material are then applied, and the patch watered from the roller tank, and well rolled until thoroughly consolidated. The system has proved most economical and is satisfactory from every point of view.

---

[*] Paper by J. S. Pickering, Borough Engineer, Chatham, Eng., read before the Irish Road Congress, held at Dublin, Ireland, April 20-22. 1910.

Constructing a Fireproof Dwelling

A builder described as follows his method of constructing a fireproof dwelling:

"The first floor was constructed of ferro-lithic plate, plastered underneath, and concreted on top to a depth of two and one-half inches. These floor plates rest on concrete girders having a special reinforcement which also took the place of false work for the beams. The girders, in turn, are supported by concrete piers. In the second floor construction specially designed I-joists, five inches deep, were employed. These joists rest on an angle wall-ribbon, which was rivetted to the exterior studs at the second floor line. The attic joists were formed of 6-inch channels and extend two feet over the outer line of the building. Six-inch metal rafters are supported upon a ridge resting on the ceiling joists. Upon the rafters were placed ferro-lithic plates, which were plastered underneath and concreted above and covered by asbestos waterproofing material. The necessary ground for concreting and plastering was afforded by expanded metal lath, applied and fastened by means of prongs punched on the structural members. The lath on the exterior was covered first with a coat of cement mortar, then with a scratch coat, then with a finished coat, left very rough. The inside of exterior lath was plastered with a heavy coat of cement plaster, thus wholly embedding the lath and producing a concrete slab two inches thick. The interior partitions were plastered with patent hard plaster on expanded metal lath."

A report of more than ordinary interest to all users of steam boilers, is that credited to the Cunard Company of an intention to build a liner for the Atlantic service, on the lines of the Lusitania, to be equipped with oil burning boilers. It is claimed that oil fuel will save an immense amount of money on a single trip, being cheaper fuel, requiring fewer firemen, and permitting a larger cargo because of the coal bunkers being largely available for merchandise, as well as there being more room for passengers. If it proves to be practicable to use oil fuel on steamships, railroads will take oil fuel up more extensively, and stationary plants of all kinds will also take up the oil fuel plan. This has been suggested time and again, and is something of an old story, but it certainly seems that there must be something to it when a corporation like the Cunard company seriously considers the matter.

To the Toronto city architect's request for an automobile for the work of his department, the Board of Control replied by granting permission for that official to hire a car when necessary. Either Mr. Macallum has got an awful snap or else the controllers have poor ideas of economy. We think the latter.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone

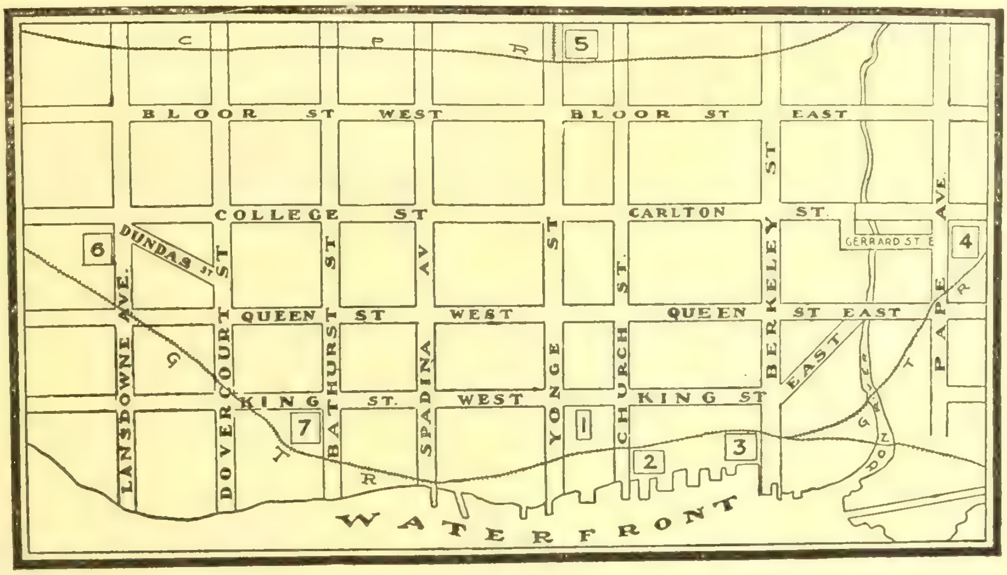
Main

4

1

5

5



No's

2,

4,

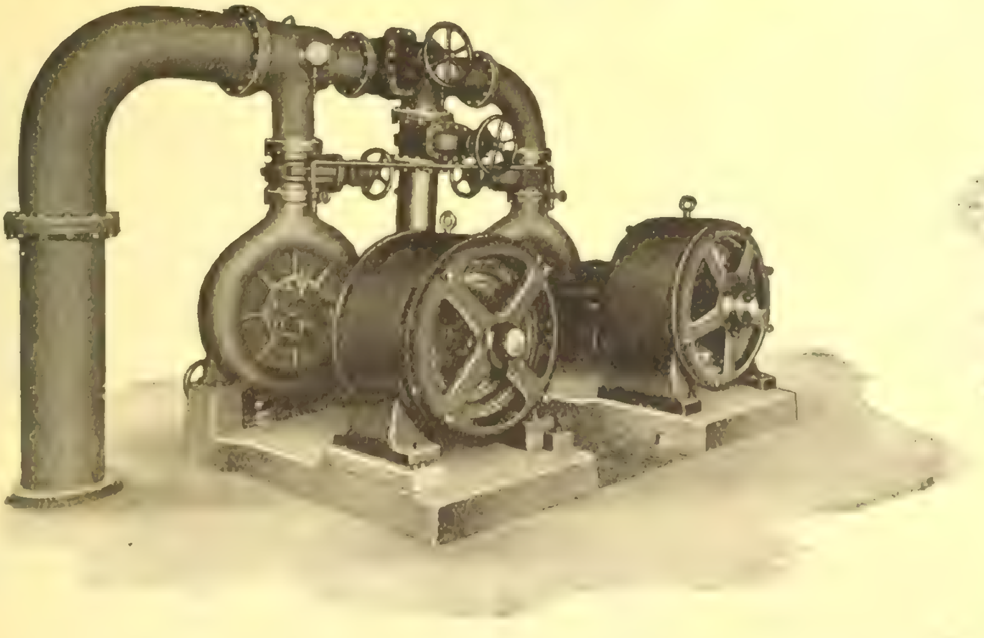
5,

6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

ROGERS SUPPLY CO., 3 King Street East, Toronto

WORTHINGTON TURBINE PUMPS



EFFICIENCY TELLS

OVER 80 PER CENT. OF THE TURBINE PUMPS IN CANADA HAVE BEEN BUILT BY US FROM THE DESIGNS OF OUR CONSULTING ENGINEER, MR W. C. BROWN, FORMERLY CHIEF ENGINEER FOR HENRY R. WORTHINGTON, NEW YORK.

THE PUMPS IN THE ILLUSTRATION MAY BE OPERATED IN SERIES FOR DOMESTIC OR IN MULTIPLE FOR FIRE PURPOSES.

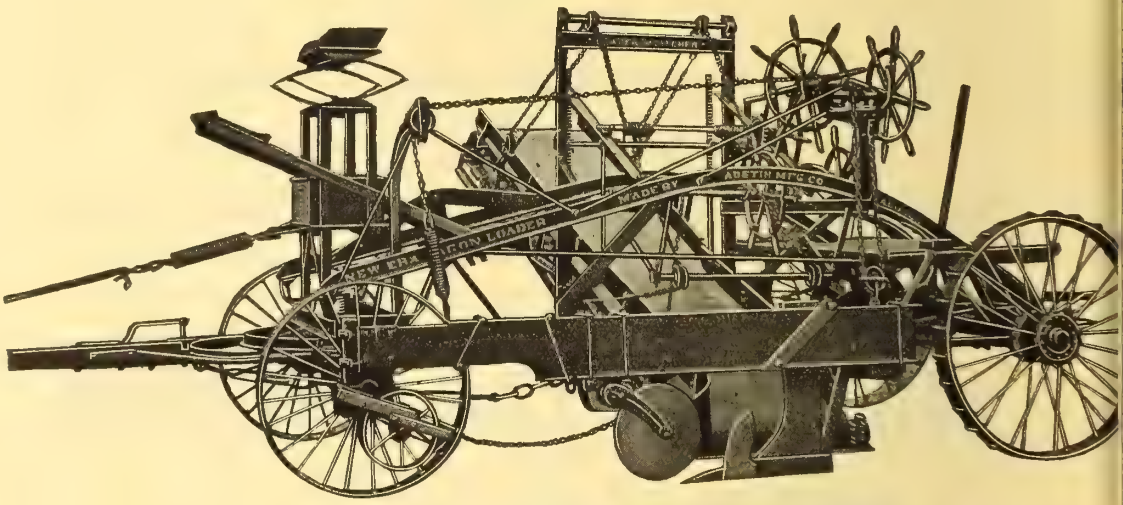
SEND FOR DESCRIPTIVE LITERATURE

WORKS:
512 WILLIAM ST., MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO., LIMITED

Elevating Graders

for Railroad Grading, Irrigation Work, Municipa
Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment

Austin Dump Wagon

Head Offices and Warehouses :
Montreal

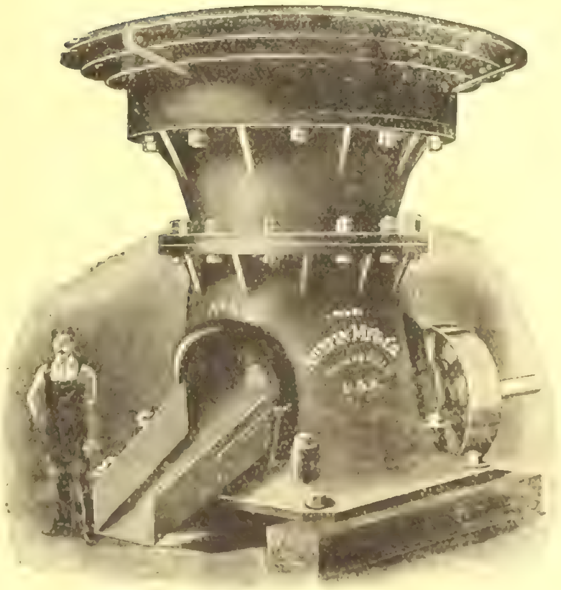
MUSSEN

mplete
Rock
Crushing
Plants

esigned and Supplied

- Crushers
- Elevators
- Screens
- Bins
- Hoists
- Derricks
- Rock Drills
- Drill Steel
- Cars
- Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co.
Hamilton - Canada LIMITED

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 180 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto July 20, 1910 No. 29

Supply Market, Situation and Outlook

In view of the fact that considerable space is devoted in this issue to building figures and reports, and that we are now advancing into the second half of 1910, it may perhaps be interesting to consider briefly the situation and outlook.

In the first place, it is only natural that we should begin to experience some decline in the volume of work planned. Every year the more important work is planned well in advance. As the summer advances, there is less and less inclination to take up the larger schemes. In building, especially, a very small percentage of the larger sized structures of any kind are started as late as midsummer, as such a tardy commencement would defer their completion into the late fall or winter. Hence the work offering at this time of the year is confined generally to smaller structures, aside, of course, from public buildings, which may be started whenever the appropriations are available or the preliminaries completed.

A strong demand is reported from nearly every department of the supply markets in eastern Canada. Brick has been a scarce commodity all the season and contractors are still experiencing a difficulty in getting their orders filled. At Toronto, common brick ranges $9, $9.50 and $10, according to delivery. Pressed brick are quoted at $17 at works and $18 delivered.

The present season has been a good one for cement, the various dealers in which report numerous sales and a well sustained demand. Prices have been advanced at times but there have been very few changes during the past month or so. At Montreal the quotations are $1.40 a barrel of 350 pounds; at Toronto, $1.75 a barrel, or $1.60 for 1,000-barrel lots; at Winnipeg, $2.20, and at Calgary $2.60.

One of the features of the market is the demand for building lumber. At Toronto, pine is quoted at $32 to $35 per thousand; common stock boards at $28 to $33; cull stocks at $20 and cull sidings at $17.50. Southern pine dimension timber ranges from $30 to $45 and hemlock, $17.50. Spruce flooring in car lots is worth $22 to $24.

1910 as a building year is looming large in the building circles of western Canada, and with a prospect of a good average crop there is every justification for expecting even greater things in 1911. An enormous number of buildings are now being erected in the West. The country school district and the smaller towns seem to be doing quite as well, in proportion to their population and available funds, as the larger cities. School buildings of good design and construction are going up at all points and in this connection it is not certain but what the small towns are beating out the cities, for there are many complaints of overcrowding in the latter. The character of the structures is improving steadily. While much of this is due to the supervision of the authorities it is apparent that there is an increasing appreciation of the necessity for advanced construction and equipment. The demand for building materials is well sustained. Prices are firm without any material advances. There is the usual shortage in some lines. Labor is none too plentiful but wages are practically unchanged. Reports received at this office from Winnipeg indicate that plans for new work are hardly as steady as they have been this season and occasional lulls are occurring in the reports of architects. This is the usual experience during the hottest part of the season. The volume of smaller structures, such as dwellings, apartment houses, stores, and so on, is well maintained and it seems probable that the totals for the season will depend largely upon this source.

Good Average Crop Assured

The crop reports from at least one reliable source, the Molsons Bank, are quite cheering in view of the pessimistic things that have been going the rounds during the last month or so. Owing to the excessive heat some districts in Manitoba will doubtless have light crops, but taking the whole province the outlook is reassuring. The sections that have suffered are southern Manitoba and southern Alberta. In the northern portion of the latter province there has been a large increase in the acreage under cultivation, particularly wheat, and there is every prospect of a good average crop.

In Ontario and Quebec the harvest promises to be better than the average. Winter wheat is generally good and some districts report that it will be the best in years. Oats and barley are not quite as good but they are above the average. And reverting to Western Canada: the west is a booming country and the fact must not be overlooked that there never has been a season in which every district has been immune from failure. There may be some truth in the assertion that the area of poor crop is somewhat larger than usual this year but it is also true that this will be amply compensated for by the increased acreage in the three western provinces.

City Engineer Angus Smith, of Victoria, recommends the construction of a civic asphalt plant at an approximate cost of $10,000. He believes that the city will effect a considerable saving by making its own paving material. Mr. Smith considers that Victoria is situated close to the source of what is probably the best asphalt in the world and that with a civic plant a good asphalt pavement can be laid at a cost of about $1.75 a yard.

Canada's Great Building Development

Returns for the First Six Months of 1910 Show Gain of 41 per cent. — Facts and Figures from Many Points

Computed from the returns of Canada's leading cities is shown an average gain of 41 per cent. for the first six months of 1910 over the corresponding period of 1909. Twenty-three cities expended over forty-seven millions, compared with thirty-three and a half millions during the first half of last year. June, 1910, leads June, 1909, by a million and a half dollars.

At present there seems to be no limit to Canadian expansion. The records established this year and viewed with wonderment by even those who are studying the field closely, are broken down next year and find a place only in the history of building development. This increase of 41 per cent. for the first half of the year is even more significant than the 54 per cent. gain made during the first three months of 1910, for it furnishes convincing evidence that the strides which are being made in all departments of the Canadian building field are due to natural development and not to any inflated conditions or temporary boom.

Town or City	June 1909	June 1910	1st six months 1909	1st six months 1910	Approx. increase for six months
Toronto, Ont.	$2,001,545	$2,302,550	$8,829,375	$9,840,648	11
Winnipeg, Man.	2,042,850	2,406,600	5,468,850	9,835,500	80
Vancouver, B.C.	657,020	1,162,940	3,493,185	6,885,880	97
Montreal, Que.	1,172,788	1,585,254	4,285,910	6,216,880	45
Calgary, Alta.	202,710	573,846	949,110	2,394,942	152
Ottawa, Ont.	1,400,775	302,250	2,623,415	1,668,275	36*
Saskatoon, Sask.	153,085	194,400	493,260	1,657,131	236
Regina, Sask.	121,650	255,318	368,310	1,342,053	264
Victoria, B.C.	90,120	312,600	789,200	1,287,835	63
Hamilton, Ont.	144,945	301,885	650,420	1,232,725	90
Edmonton, Alta.	201,290	233,670	1,054,476	1,092,220	4
Fort William, Ont.	307,125	256,225	1,979,445	939,280	53*
Lethbridge, Alta.	82,170	92,005	659,775	748,000	13
London, Ont.	127,639	38,586	557,789	452,466	19*
Peterboro, Ont.	44,322	145,470	177,358	408,993	130
Port Arthur, Ont.	17,600	65,375	155,200	310,310	100
Strathcona, Alta.	18,800	13,350	91,100	270,100	200
Brantford, Ont.	25,805	109,145	131,600	241,430	83
Sydney, N.S.	22,360	69,789	65,725	204,652	211
Halifax, N.S.	66,830	21,630	373,760	176,450	53*
Stratford, Ont.	16,150	16,500	78,650	112,118	43
Windsor, Ont.	48,550	31,075	201,010	109,480	45*
Kingston, Ont.	40,975	11,545	174,860	100,143	43*
Total	$9,007,104	$ 10,502,008	$33,651,783	$47,527,511	

Average increase, 41 per cent.

*Decrease.

Several decreases will be noted in the accompanying table, but in nearly every case a substantial reason for the decline is given in the building reports. Ottawa, which is 36 per cent. to the bad, is a notable example, the building permits for the first half of last year having been swelled up by the total for the G.T.R. work. Fort William is another, this city having been badly handicapped by a carpenters' strike.

The small margin between Toronto and Winnipeg, the remarkably close finish in which the former city obtains the leading honors, is suggestive of a 100 yards' dash. Vancouver, which led for the first three months of the year, falls into third place, with Montreal, a keen competitor, one behind. The records made by the three western cities, Calgary, Saskatoon and Regina, are particularly noteworthy, the increases being respectively 152, 236 and 264 per cent.

A gain of 63 per cent. for Victoria, B.C., is very satisfactory. Hamilton, with an increase of 90 per cent., remains in the limelight.

Toronto, Ont.—The city's position at the head of the list is a significant sign to those interested in building and development work throughout Canada. It is a clear indication of prosperity and seems to show that Toronto is destined to become the commercial metropolis of the Dominion. In addition to the figures given in the above table the following may be of interest. From January 1st to June 30th, 1909, the number of permits issued was 2,427, against 3,032 in the corresponding period of the current year. Last month 1,200 permits were issued, compared with 860 in June, 1909. The number of buildings erected during the first half of last year was 3,540, compared with 4,290 this year. It is noteworthy that a number of good sized permits for factories have been issued to United States firms who are building Canadian branches in Toronto. We look for increased revenues from this source on the ground that American firms are finding it more profitable to manufacture their goods at the scene of activity than to ship them from the other side.

Winnipeg, Man.—(Correspondence of the "Contract Record): Building figures for the first six months of 1910 show an increase of $2,777,350 over the highest previous record for the same period of any other year. The former record was established during 1906, and while this year eclipses it in total valuation, 1906 still holds first place in the number of permits issued and in the number of buildings erected. The detailed comparative statement of building operations for several years appended substantiates the belief that the permits for the year will total more than fifteen millions.

COMPARATIVE FIGURES

Period	Permits.	Buildings.	Cost.
June, 1906	416	501	$1,436,450
June, 1907	337	412	1,110,600
June, 1908	196	229	802,200
June, 1909	418	490	2,042,850
June, 1910	373	461	2,406,600
Six months—			
1906	1,835	2,251	7,058,150
1907	1,606	1,907	4,443,850
1908	714	807	2,238,250
1909	1,305	1,545	5,468,850
1910	1,789	2,201	9,835,500

During the fiscal year of 1910-11, the city of Winnipeg will spend $2,431,896.01 in conducting the business of the corporation. Two-thirds of this amount will be spent by the various departments on improvements which are open to tender, and a big slice will go to the contractors of Canada.

By the new assessment roll which has been issued by the city the total valuation of properties is $185,870,140. Of this amount, $28,261,920 is exempted from taxation. The value of assessable buildings at the two-thirds rate of assessment is $48,934,150, or a total value of buildings aggregating more than $72,000,000. Assessable land is valued at $108,674,070.

Vancouver, B.C.—S. H. Jarrett, Building Inspector: "The outlook here for 1910 is that the year will show an increase of 75 per cent. or over. There is great activity at the offices of the leading architects of this city. The demand for dwelling houses is a feature of the situation. I am confident that we shall leave the previous banner year far behind."

North Vancouver, B.C.—Thos. Shepherd, City Clerk: "There is greater activity here than ever before. Among the buildings planned may be mentioned the Bank of Hamilton and Keith Block, to cost $80,000; the Balfour Ker Block, to cost $30,000, and the Pythian Castle Hall, to cost $22,000. Among the residential work completed this season may be mentioned five first class residences on Grand Boulevard which cost $40,000. The Provincial Board of Health has approved plans of a new sewerage system and the installation of this will commence immediately. The permits issued during the last month amounted to something over $50,000. We have no previous records so are unable to supply you with the necessary figures for the table."

Montreal, Que.—(Correspondence of the "Contract Record")—June building statistics show a gratifying increase in amount of permits issued during that month as compared with June of the previous year, and in consequence the total results for the first six months of this year are agreeably higher than those during the same period in 1909.

July gave indications of setting a high level mark, when in one day alone permits aggregating more than $2,000,000 were issued.

Just what effect the present troubles between the master builders and brick and mason contractors will have towards restricting activity along this line is hard to estimate, but according to Inspector Chausse the influence of the strike is being seriously felt in his department and there is a very noticeable dropping off in the applications for building permits. Even at that, July is bound to be a great building month and the year should wind up with a new record.

Calgary, Alta.—W. D. Spence, city clerk: "Considerable difficulty is experienced in this city in regard to obtaining materials and labor, and this is retarding the progress of buildings now under way. Prices of materials have naturally advanced. Prospects are bright, however, for the immediate future, and extensive building and development work is anticipated."

Ottawa, Ont.—"The comparatively poor showing made by the first half of 1910 is accountable for by the fact that during the first half of 1909 the permit was issued for the erection of the new G.T.R. hotel, a structure which in itself involves an expenditure of more than a million dollars. As a matter of fact the building conditions and prospects in the Federal capital are excellent and it is quite possible that 1910 will set a new high record."

Saskatoon, Sask.—J. E. Harrison, C.E., Building Inspector: "Building conditions and prospects are excellent. The construction entering into the erection of business blocks in this city is of the very best, the buildings now going up being of brick, brick and stone, and reinforced concrete. The residences that are being built this year show great improvement both in regard to design and finish."

Regina, Sask.—Building permits for this city issued this year amount to practically four times the total of last year. For the first ten days of July the building permits were $88,555, which exceed last year's figures for the whole month by some $38,000. There are some 325 buildings of all descriptions now under construction. These, with the large contract for the trunk sewer and disposal works, now being constructed by the city at an estimated cost of $300,000, have made a considerable stir in contracting and building records. 1910 will undoubtedly exceed all former years in the history of the city.

Among the notable undertakings under construction at the present time are: Parliament Buildings, approximate cost, $2,000,000; Albert street subway, $125,000; new trunk sewer, $190,000; R. H. Williams' departmental store, $100,000; new General Hospital, cost of building, $105,000; new General Hospital, furnishings, $15,000; new Exhibition Buildings, $75,000; Grey Nuns' Hospital, $105,000.

City municipal work contemplated for this year now totals approximately $600,000, not including the cost of the new municipal street railway which is to be installed shortly.

Hamilton, Ont.—J. M. Anderson: "The building conditions at present in Hamilton are very good. The amount of new factory buildings and additions to the older concerns is greater, and will be greater than any year in the history of the city. The present outlook is very bright, with lots of building material and with no possible chance of strikes or labor troubles. There is no doubt that the building industry for 1910 in this city will be the best in its history."

Edmonton, Alta.—E. H. Cotterell, C.E., Building Inspector: "The prospects for the remainder of the year are very good indeed. Several large buildings are contemplated, these including new opera house, General Hospital, fire hall, theatre, Union Bank buildings and several apartment and business blocks. The crops in this district are in first class condition, rain having fallen in abundance at the right time, thus ensuring confidence. As an indication of the progress of this city, I may mention that there are now six large banks in course of construction within a stone's throw of each other in the centre of the city. The buildings are of excellent design and are constructed in brick, reinforced concrete and stone fronts."

Fort William, Ont.—S. Macnamara, Building Inspector: "There has been a considerable set back to the building trade in this city during the past month or so, caused by the carpenters' strike, which lasted for the best part of June, otherwise building operations and prospects never looked better than they do this year. Although the figures show a con siderable falling off compared with last year's returns, the development of the city is very much greater. A great deal of work not classified under building is being done, this including docks, railway and street railway construction. Much more money is being spent in wages now than in any previous year."

Lethbridge, Alta.—H. W. Meech, Building Inspector: "Lethbridge continues to make steady progress. As far as can be seen at present I am of the opinion that the value of building permits will go on increasing from month to month and that by the end of the year we shall have a new record to work upon."

London, Ont.—Arthur E. Nutter, City Architect: "The present year started well, but during the last three months there has been a considerable falling off from the 1909 totals. The number of large works undertaken this year is rather smaller than usual although a great deal of improvement work is being made generally. There are prospects of several large works starting up in this city. If these materialize the year's business will be greatly improved."

Strathcona, Alta.—A. J. McLean, city engineer: "A large number of buildings are in course of construction although the total for June this year shows a decrease compared with the corresponding month of 1909. There is a substantial increase for the six months of 1910, as will be seen by the table. The construction of the C.P.R. bridge over the Saskatchewan river will be commenced not later than September 1st. Altogether the prospects for the balance of the year and for 1911 are excellent."

Brantford, Ont.—T. Harry Jones, City Engineer: "Building is being carried on extensively in residential, business and factory areas of this city and many promising schemes are under consideration, the whole pointing to a record season for Brantford."

Sydney, N.S.—D. McD. Campbell, City Clerk: "Building operations in this city are much more active this year than last. The figures given in the table do not include the improvement work now being carried out by the Steel Corporation. In addition to a number of good residences the new Sydney Academy, the St. Andrew's Church and a new fire station are under construction. Prospects are exceedingly bright."

Kingston, Ont.—H. B. R. Craig, City Engineer: "The poor showing made by this city in the above table is attributable largely to the strike of the carpenters and masons which was in force for over a month and which practically suspended building operations. It does not indicate that Kingston is on the downward grade. Indeed, prospects here look very good."

Prince Albert, Alta.—1910 will probably see more actual development in this city than any two or three previous years. The most important work under way is that on the Dominion Penitentiary. This structure when completed will be one of the largest of the kind in the Dominion and will accommodate prisoners from the whole of the province. The power station for the institution is now being built, also a building which will serve eventually as a work shop, but temporarily as cells. The present work will probably cost $100,000. It will be quite a number of years before the main building, which will probably be built by convict labor, is finally completed. The next most important works to be started at Prince Albert are the wharf and river bank protection which will cost about $75,000. Probably $100,000 will be spent on paving work this year. Of the larger buildings, work is well advanced on the Masonic Temple on Tenth street, costing $60,000, and a start has been made on the Grey Nuns' Hotel, which will cost approximately $100,000. The Imperial Bank are putting up an attractive building on Tenth street. A number of business and apartment blocks are under discussion, also additional accommodation for schools. The four brickyards in and around the city report an enormous demand for their output. The lumber mills are enjoying an excellent demand from the prairie. It is expected that the city will receive quite an impetus with the advent of the G.T.P. during the coming winter and the C.P.R. next summer.

Portage la Prairie, Man.—The season of 1910 promises to be a busy one with the building trades of Portage, and one contractor states that he cannot remember when so many buildings were being erected or going to be built at one time as at the present. The brick buildings which are in course of construction, or on which work will begin shortly, are the new home for the Urban Mutual Fire Insurance Company, the new north ward school, the Old Folks' Home, which is an addition to the Home for Incurables, and the new block for Burk & Andrich. In addition to these, a number of private residences are under way.

Brandon, Man.—At the present time building is exceedingly active in this city. There are now under construction several fine hotels, among which may be mentioned the Cecil, the Royal and the Canadian Northern Railway Hotel. The Codville Company are erecting a large warehouse on Ninth street, and immediately adjoining, Clement & Company are putting up a fine office and apartment block on Tenth street. In the same block a new theatre is being built by Hughes & Company. If the building operations of to-day are a fair criterion of Brandon's growth and prosperity, the city is entering upon an era of development which will be the greatest in its history. In the business portions of the city many of the streets are almost impassable by reason of the fences which have been erected around new buildings in course of construction and nearly every day finds some addition of this kind. There is the same activity in the residential sections of the city.

Yorkton, Sask.—Yorkton's building operations for 1910 will reach $300,000. This is not the result of any boom but is caused solely by the demand for public buildings, mercantile houses, manufacturing establishments and residences to meet the demands in eastern Saskatchewan's rapidly growing metropolis. Features of the buildings just completed, now being erected or planned, are their substantial character, architectural beauty and modern appointments throughout, proving that Yorkton has long passed the western "shack" stage and is fast merging into the more permanent and lasting building era which characterizes the growth of cities.

Fort Saskatchewan, Alta.—The Secretary, Board of Trade, writes: "Tenders are being called for by this town for the construction of a water power plant for the generation of electric power, the cost to be $30,000. The building permits issued since May 1st are inconsiderable. Some large buildings were completed on permits issued previous to that date. As regards the labor situation, the local supply will not meet that required for the municipal work projected. The town has a population of 1,100 and is situated in one of the richest parts of Alberta. It is one of the oldest settlements in the west, and, with the offer of free power, is in a position to attract industries of all kinds."

The proposal has been made at Ottawa to institute a test of the European system of ozone purification and it is possible that Dr. Karl Frank, representing Siemen & Halike, the New York agency of the German firm of Siemen & Schuckcotwerke, will be invited to Ottawa. It is claimed that the ozone system has been employed successfully at St. Petersburg, Paris and other European cities.

Methods of Repairing Brick Sewer

The following method of repairing a brick sewer was employed at Worcester, Mass., by Matthew Gault, Superintendent of Sewers. The sewer was built in 1870 and the bricks were soft, the cement poor and sparingly used and the grade steep. The result was that many of the brick in the bottom of the invert were loose and badly worn and the sewer in a dangerous condition. The sewer is a 24x36-inch oval and, as it was necessary to lay hose inside of the sewer to provide for the large flow of sewerage from the district above, the space available for working was very much contracted. The work was done in sections. At the upper end of each a sand bag dam was placed. Two and sometimes three lines of 3-inch pump hose, 60 feet long, extended through the dam, thus taking the flow and keeping the invert dry. When a connection was encountered an extra line of hose was laid to accommodate it. The hose were supported on short strips of boards laid across the sewer about 6 inches above the invert. From three to four inches of cement mortar placed in the invert and carefully trowelled completed the work. After the cement had hardened sufficiently to withstand the flow of sewerage, the dam and hose were moved ahead.

Concrete Floor Tested for Fire

A test of a reinforced concrete floor was made recently under very unusual conditions, says "The Engineer," including a fire test with the floor under load, the fire test apparently being required under the city's building ordinances. The structure was a ten-storey office building, with floor panels 22 feet by 20 feet centre to centre of columns. The floors were designed for a working load of 100 pounds per square foot, and were required to stand a test load of 200 pounds per square foot with a deflection not exceeding ¾-inch. The deflection with this latter load on a test panel of the floor was only ⅛-inch. The building inspector then had a fire test made of the loaded panel, and with a hot fire beneath the deflection increased by 1⅛-inch. Water from a fire hose was then thrown up the bottom of the heated slab, and the recovery was ⅞-inch, leaving ¼-inch deflection. A small amount of concrete spalled off under the action of the stream of water. The building inspector considered the result unsatisfactory in leaving ¼-inch deflection, and the approval of the structure on behalf of the city is now in dispute. It is pointed out that the heated bars in the lower part of the slab may have taken a slight permanent set as the effect of the sudden cooling. While many fire tests on concrete slabs have been made in special test chambers, it is very unusual to require such a test in a completed building.

The Need of Standardizing Bricks

Dealing with the great variety in quality of bricks, brought about by the fact that architects and builders seem at present to be satisfied with very low grades, Mr. A. B. Searle, a recognized authority of London, Eng., said recently that whilst public authorities failed to recognize the difference between bricks and rubbish, a large amount of pioneer work would be necessary before a minimum standard for brick would be obtained and recognized. Concrete, which is one of the largest competitors, has been subject to standardization from its inception, and it would be a good day for brick-makers and architects when similar standards were imposed upon bricks of all kinds. The present system of unlimited competition is rapidly resulting in the average brick being of an unnecessarily low quality, imperfect in texture and badly fired, and the reduction in cost of manufacture is being carried to an extreme. Whilst the chief characteristic of a good brickmaking material should be its plasticity, the tendency of modern brickmakers is to avoid the property of plasticity, because it introduced certain processes in manufacture, the cost of which it was necessary to eliminate owing to low prices due to the excessive competition; the quality of the bricks is of secondary importance.

This condition of affairs had led to a movement having for its object the suppression of all plasticity in clay, viz., the dry process, the earth being shaped in presses, the compression being such that the bricks have sufficient cohesion to enable them to be taken to the kilns whilst hot and to result in the production of a brick which meets the public demand. Microscopic examination, however, shows that bricks made of the more plastic materials are undoubtedly far superior. On the other hand, if cheap prices are to prevail, this "dry" process must be continued. It is a process which has become extremely popular, but brickmakers are slowly and surely returning to bricks made of partially plastic material, as the limitations of the "dry" process are coming to be recognized. He objected to the terms "semi-plastic," "semi-dry," and "stiff plastic" processes. They are unsatisfactory and misleading terms, representing stages between the wet and the dry processes, and intended to convey the impression that the bricks so obtained have some of the qualities of the older methods.

Forest fires recently exploded two powder magazines owned by Contractor McEwen, who is working on the N.T.R., north of Lake Nepigon. The magazines contained 100 cases of explosives, and were valued at $15,000. They were on an island, and the fire jumped across from the mainland. No one was injured.

When Paint Spots

In two-coat work poor lumber and thin painting often cause spots on paint. The oil penetrates into the wood more freely on crossed grained and other porous surfaces, and the result is flat places in the paint which fade more quickly than a glossy paint. This makes the work look spotted.

Spotting due to poor lumber and porous surfaces can be guarded against if more care is taken in applying the priming coat. Make it a point to thoroughly fill all extra porous places with the priming coat, or go over such places twice before the second coat is applied to the entire building.

The practice of applying a coarse dark priming coat is another cause of spotting. This dark under coat is likely to show through in spots where the paint is put on too thin.

The use of too much Japan, fatty or poor quality oil, which makes the paint dry, tacky and soft, often results in mildew, which causes spotting and degeneration of the paint film.

Another cause of spotting is insufficient and improper brushing out of the paint, particularly on the priming coat. A great many painters still fail to realize that the priming coat requires as much care in applying as the second or finishing coats. Many jobs show "laps," and when the second coat goes over a priming coat which shows "laps," trouble usually results.

The surface has at least one more coat where the "laps" show than the balance of the job, therefore the paint is very likely to show spots when it fades out.

Winnipeg's New Union Passenger Depot

A Detailed Explanation of the Most Interesting Points of Design and Construction — Progress Views from Start to Completion

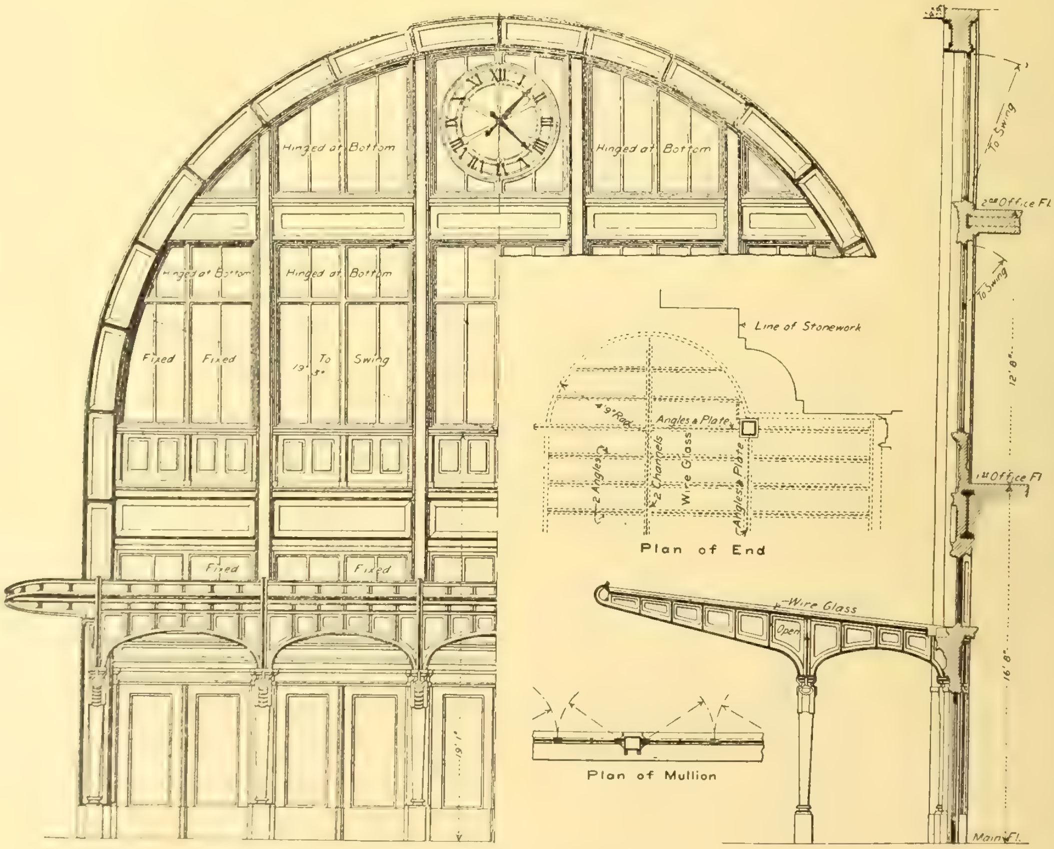
The story of progress in the erection of the new union passenger station for the C.N.R. and G.T.P. at Winnipeg, Man., as told in the accompanying views will doubtless be of interest to many of our readers. The building has a frontage on Main street of 352 feet and a depth of 140 feet, and covers a ground area of approximately 50,000 square feet. It comprises basement and four storeys, surmounted by a dome 90 feet in diameter and 100 feet above street level. The new depot, known as the Fort Garry station, forms part of an extensive project involving a system of trackage and railway buildings which will provide one of the best equipped terminals in the world.

The main floor of the building has a large circular lobby in the centre under the dome, with waiting rooms, restaurant and lunch room on one side, and ticket offices and baggage rooms on the opposite side. It communirates through the rear of lobby, via the subway and stairways, to wide platforms between the eight through tracks which have a capacity for 200 cars at a level of 10 feet above the main floor. The main lobby is entirely unobstructed by columns or seats of any kind and is exceptionally well lighted on all four sides by large arch windows. In the basement there is a waiting room with an area of 10,000 square feet, besides excellent accommodation for immigrants. The second, third and fourth floors will be devoted to office purposes. Ultimately, it is planned to add four more storeys to provide a total of 200,000 square feet of office room. The building is designed so as to obviate the necessity for artificial lighting through the day. Indirect steam heating is installed with mechanical ventilation. The columns are supported at the foundations by wooden piles driven to rock bottom, this being necessary on account of the heavy column loads and the character of the clay underlying the site.

The columns all have I-shape cross sections, made with a solid web plate and four flange angles reinforced with cover plates when necessary.

The maximum column load is 1,292,000 pounds and the corresponding cross sectional area is built up with four 6 x 4 x 11/16-inch flange angles, one 12 x ½-inch web plate and eight 14 x 11/16-inch flange cover plates. The lower sections of the columns, about 37 feet long, extend through the basement and first storey, and the second sections, which extend through the second, third and fourth storeys, each of them 12 feet 8 inches high, are about 38 feet long, excepting under the dome, where some of them are about 50 feet long. The third, or fourth storey sections are 12 feet 8 inches long.

Columns with heavy loads have extended bases, distributing them across the full-width of I-beam grillages, seated on concrete footings with pile foundations. The base plates, 1-inch thick, project considerably beyond



Main Entrance to New Union Depot, Winnipeg.

1.—September 4th, 1908. Pile Drivers, driving wooden piles in foundation for piers and walls.

the column flanges and are reinforced by extended wing plates riveted to the column flanges and by stiffener angles on the wing plates. The grillage beams are entirely enclosed in concrete, which is extended up to cover the base plates of the columns.

The grillages for the heaviest loads are made with four 36-inch I-beams, and those for smaller loads are made with three 24-inch I-beams. The grillages are set on rectangular concrete footings, reinforced by horizontal old rails just above the tops of their foundation piles. The heaviest column loads have 16 piles for their foundations, those with the 24-inch grillage beams have nine piles, and the lightest column loads have only two piles, and the colunms there are seated directly on the concrete footings without the interposition of grillage beams. About 3,000 wooden piles, 35 feet long and 14-inch in diameter at the top, were driven to bed rock for the foundations.

With the exception of a few of the wall columns, which are especially grouped for architectural considerations, and a few of those in the dome construction, all columns are located at the intersection of longitudinal and transverse lines from 18 feet 7 inches to 23 feet apart, thus affording advantageous lengths of floor panels and making very regular beam and girder construction. Excepting some box and plate girders in the second floor, which are introduced to carry offset upper storey sections of the columns and to span extra long distances between columns, all of the girders are made with single or double I-beams 18 or 20 inches deep, and all of the floor beams are single I-beams, most of them 12 inches deep.

At the second floor level the office rooms on both sides of the rotunda are connected by a balcony 5 feet wide and octagonal in plan, enclosing the dome above the rotunda. In the corners the balcony floor is carried on diagonal I-beams framed to the regular floor girders and on the long side it is supported from angle iron brackets rivetted to the main columns and carrying fascia angles to support transverse beams made with pairs of angles rivetted together back to back and connected at their inner ends to corresponding channels supported directly by the columns.

The second floor beam plan is nearly symmetrical

2. Nov. 3rd, 1908. Showing forms for concreting exterior basement walls of building

3.—December 9th, 1908. Showing progress of steel erection, north end of building.

about the centre transverse line, except that one side of it is one panel longer than the other side. The skylight roofs over the first storey rooms on both sides of the rotunda are supported at the second floor level by trusses. These so-called trusses are more properly arch ribs with solid webs and curved bottom flange angles. Straight inclined top flange angles act as rafters carrying the curb girders and purlins for the skylight framing.

The second floor box girders are proportioned for a maximum column load of 632,000 pounds 2 feet 10 inches from the end, and have two 25 x $\frac{3}{8}$-inch web plates in the planes of the flanges of the supporting columns. There are also eight 6 x 6 x $\frac{7}{8}$-inch flange angles and two 26 x 15/16-inch cover plates, besides four 7/16-inch web reinforcement plates under the second storey columns.

The third floor plan resembles the second floor plan, except in the framing around the rotunda, in the absence of box girders and the open spaces caused by the light court. It is typical of the framing of all office floors, and with the exception of plate girders is made almost wholly with 12-inch, 18-inch and 20-inch I-beams.

In all storeys the lintels for the exterior stone walls are made of one 12-inch I-beam for every 8-inch thickness of the wall for spans of 8 feet and under. For more than 8 feet, 8-inch 18-pound I-beams are used. For the interior brick walls one 4-inch $7\frac{1}{2}$-pound I-beam is used for every 6 inches in thickness of wall for spans up to 10 feet. For 3 and 4-inch terra cotta walls one 4-inch $7\frac{1}{2}$-pound I-beam is used for spans up to 4 feet, and one 6 x 4 x $\frac{3}{8}$-inch angle is used for spans between 4 feet and 10 feet.

The roof over the wings correspond with the floor, except that it is made lighter with single instead of doube I-beam, long span girders, and that they are slightly pitched from the interior to the exterior columns and will eventually support a raised skylight. The building has already been modified from the original plans by the construction of the fourth storey with the lower storeys, instead of adding it at some future time as was at first intended. This has been accomplished by modifying the steel connections at the tops of the third storey columns, so that they would receive the floor beams instead of the roof beams, and the latter have been shifted to the tops of the single-storey column sections, added above the fourth floor, and are connected to the latter in such a manner that they can hereafter be removed and be replaced by permanent horizontal

4.—April 1st, 1909. Completion of steel work.

5.—June 22nd, 1909. Stonework, front facade of building.

6.—June 22nd, 1909. Erection of stonework at south end of building.

floor beams, the inclined beams being transferred to the new roof level.

The columns are fitted with connections for both sets of beams, but as the latter are at the same elevation at the lower end, the suspended ceiling will have to be removed, when future additional storeys are added to the present building.

The dome framing is made with 12 radial trusses, which are supported on columns at the lower ends, and at their upper ends are connected to an octagonal framework of vertical trusses, which transmit the balanced reactions across the 30-foot open central space. Intermediate trusses are similar to the main trusses except that they are somewhat shorter and of lighter construction, and are supported at their lower ends on horizontal trusses, which connect the dome columns. The radial trusses both have skeleton framework extensions above their top chords to carry the rafters and curved purlins of the convex dome roof. These extensions cantilever beyond the inner ends of the trusses to carry the octagonal framework 19 feet in diameter for the centre monitor. I-beam purlins in the dome are spaced about 6 feet apart and support a continuous reinforcement concrete roof slab 3 inches thick, which is waterproofed and covered with flat tiles.

In the front wall of the station there is an arched window with a rivetted box girder casing, which forms a full-centered arch rib, 38½ feet in diameter and 15 inches deep. This is divided into five panels by four intermediate rivetted columns connected by rivetted transverse girders forming window heads and sills, differing notably from the ordinary mullions and cast iron construction.

7.—October 15th, 1909. Central portion of dome interior in course of construction.

Below the window over the main entrance there is a large and wide marquise, with semi-circular ends supported on rivetted cantilever girders, which are anchored to the main wall columns and fulcrumed on six ornamental cast iron columns about 7 feet clear of the walls.

Our contracting friends will be particularly interested in a close observance of the progress of this work. The first photograph, taken Sept. 4th, 1908, shows the pile drivers, driving wooden piles in foundation for piers and walls. Wooden piles, 35 feet in length, were used, these being driven to refusal. As the character of the soil beneath the footings for the space of 35 feet down to hardpan was of a very wet nature, and as the piles are practically sealed from sun and air, the life of these wooden piles should be as long as any concrete pile. At the left of this photo is shown an interesting test made upon a single wooden pile, a test load of 70 tons being balanced on the butt of this one pile, which had been driven to refusal, bringing up on hardpan a distance of 35 feet below the level of column footing. This load was carried by the pile for a period of two weeks without any settlement whatever.

In the second illustration, taken Nov. 3rd, 1908, will be seen the forms for concreting the exterior basement walls of the building. At this time the concreting for these walls was just about ready to commence.

Illustration No. 3, taken Dec. 9th, 1908, shows the

8.—December 20th, 1909. Front facade of completed building.

9.—December 20th, 1909. Stonework main entrance.

erection of steel at the north end of the building well under way. In another, taken April 1st, 1909, the steel work is shown completed. The fifth picture, taken June 22nd of last year, shows the erection of stone work on the front facade of the building. No. 6, taken on the same date as the preceding picture, depicts the erection of stone work on the south end of the building and of the wall at the rear of the building. This wall, it is interesting to note, is built of sand lime brick manufactured near Winnipeg.

The seventh picture, taken Oct. 15th, 1909, shows the interior construction work on the central portion of the dome.

No. 8, taken on Dec. 20th last, shows the front facade of the completed building. Another view, taken on the same date, conveys an idea of the excellent stone work on the main entrance. The last illustration, taken on May 1st, 1910, is an interesting view affording a glimpse of the construction of steel viaducts for elevated passenger tracks and platforms at rear of building.

Trains are to be run in at this level and reached by subway beneath this viaduct. All baggage, express and material will be located in warehouses beneath this viaduct and taken up from the warehouses below to the tracks above by means of electric elevators. The building shown by this photo in the distance is the new stable building, completed on Jan. 1st, for the C.N.R. Cartage Company. This building has a capacity of 150 stalls.

10.—May 1st, 1910. Construction of steel viaducts for elevated passenger tracks.

The Fort Garry depot was designed in accordance with the requirements of Mr. William Mackenzie, president, and Mr. D. D. Mann, vice-president, of the Canadian Northern Railway, and Mr. Charles M. Hayes, president of the Grand Trunk Pacific Railway. The architects are Warren & Wetmore, of New York City; Mr. J. D. Matheson, engineer in charge. The steel work was designed by Balcom & Darrow, under the direction of the architects. The general contractors were Peter Lyall & Sons, of Montreal and Winnipeg, and the 1,800 tons of structural steel were fabricated and erected by the Dominion Bridge Company, of Montreal.

Other contracts included: Ornamental iron work, Canada Foundry Company, Limited; Kahn system of reinforced concrete, Trussed Concrete Steel Company of Canada, Limited; roofing and sheet metal work, A. B. Ormsby, Limited, Toronto and Winnipeg; interior woodwork, G. W. Murray Company, Limited, Winnipeg; lighting fixtures, Robert Mitchell Company, Limited, Montreal, Toronto and Winnipeg; plumbing and heating, Jas. Ballantyne & Company, Montreal and Winnipeg; marble and tiling work, the Great Marble & Tiling Company, St. Paul, Minn.; electrical work, Mitchell Electrical Company, Winnipeg; painting, Talbot & Crawford, Winnipeg; decoration, Hector Chalmers, Winnipeg.

In the compilation of this article we are indebted to the "Engineering Record," New York, for information pertaining to the features of design, and to Mr. J. D. Matheson, of Winnipeg, the engineer in charge, for interesting particulars concerning the progress of the work and also for the views published herewith.

An Interesting Discovery at Ottawa

Workmen engaged on the excavation for the new Rosenthal Building, Ottawa (illustrated and described in a recent issue of this journal), unearthed an old well about 15 feet below the street level. The well, which had evidently not been used for many years, was probably dug by some early resident of old Bytown. It was situated directly under the east wall of the buildings that have been torn down to make way for the Rosenthal structure and must have been in disuse for at least 60 years, as that is the reputed age of the buildings just razed. An old fashioned suction pump, still in good repair, and the head of an axe were found in the bottom by the workmen. The well was evidently the work of a skilled well-maker, for despite the years since it was dug the wall of rubble stone around the sides is still in fine repair. Some six feet through solid rock was bored by the early resident before he struck water, and to-day it is gushing up with probably as much energy as it did when first bored. One of the workmen sunk his crowbar down this depth before he struck bottom.

Handling concrete in narrow gauge cars has been adopted for the floor of the Pedro Miguel lock of the Panama Canal. The plant is a temporary one, put up for use until the large handling equipment described in the "Engineering Record" of September 25, 1909, is in service. The concrete is mixed in a plant on the side of cut for the lock and discharged into large buckets. These are picked up by a locomotive crane running on a track along the side of the cut. The buckets are dumped into hoppers elevated on a platform and provided with chutes discharging into cars on two parallel lines of track running across the site of the lock. These tracks are laid near the edges of the trenches in which the lock culverts are located and the concrete is dumped directly into place from the cars. Blaw collapsible centres are employed for these culverts, and are held down by wire anchors while the culvert is being constructed, for otherwise the soft concrete would force them out of place. A part of the equipment has been rigged up from French plant found in the jungle.

Construction work on the main line of the Canadian Northern Railway from Edmonton to the Yellowhead Pass will be commenced at once. The contract for the first section from Edmonton to the Pembina river, a distance of 70 miles, has been awarded to McMillan Bros., who are now on the scene preparing to start work. The whole 70 miles will be graded as rapidly as possible and the company hope to have the rails laid before Christmas. The contract for the line from near Stettler to the Brazlau coal fields will be let shortly.

The Canadian Northern Railway will make extensive improvements on the main line between Winnipeg and Edmonton this summer. The road will be thoroughly ballasted and relaid with 80-pound steel in place of the 60-pound rails now in use.

G. T. P. Construction in New Brunswick

Important Railway Work now in hand will mean much for this Maritime Province—Systematic Development of Resources Assured

Within a year the province of New Brunswick will have had 256 miles added to its railway mileage, which, in proportion to the population, is already very large, intersecting the province in all directions.

The construction of the Grand Trunk Pacific in New Brunswick has probably been easier than in almost any other part of New Brunswick or Nova Scotia, but naturally to get the grade required, some very heavy work was necessary. There is one great viaduct, near the falls of Upper Salmon river. While the stream is only 100 feet wide, it is necessary to construct a viaduct across the valley for a length of almost 4,000 feet. It is 200 feet high at the river, and 180 feet high for two-thirds of its entire length, and requires 7,000 tons of steel in construction. The mere statement of these figures indicates the vastness of the structure. There is one tunnel on the line n New Brunswick. It is at the summit of the watershed between the St. John and the Tobique, and is 500 feet long.

Nine Millions Expended up to June 1st

It is estimated that up to June 1st about $9,000,000 had been expended on the line in New Brunswick, not including the steel work. When completed the whole road through the province will have cost in the neighborhood of $60,000 per mile.

With the exception of thirteen miles near Chipman, the first 180 miles of the road from Moncton is through a wilderness region. For the first 100 miles it is through one which has very little growing timber, or from which most of the timber has been cut. It is a sandstone country and the soil is regarded as rather poor. A hundred miles from what is called the Campbellton road, the great highway through that section, the character of the country changes. For 20 miles there is a slate formation, and for the next 20 granite, with very little growth. Then comes slate again, and a slate, plaster and limestone country right through to the Quebec boundary, with good farming land. East of Grand Falls for about 70 miles, the line runs through a settled farming country and it is stated, that for some 30 miles, through French settlements with narrow farms, it was necessary to provide a railway crossing about every 100 miles. There is still a good deal to be done here and there along the line before it will be ready for operation. The great Salmon river viaduct is the most tedious piece of work. When completed the road will be first-class in every particular as to grade, roadbed and equipment. President Hays says it will be operated as soon as finished, and thus opportunity will very soon be afforded to enterprising settlers, lumbermen and manufacturers to begin the systematic development of the natural resources along its route.

International Nearing Completion

In connection with railway construction in New Brunswick it is worthy of note that the International Railway, across the province in the north, from the Maine border to Campbellton, making connections with a line to Gaspe, is about completed. It has been under construction for quite a number of years and opens up a very rich timber country. There are rumors that this line with its Gaspe connection may have something to do with through business to a winter port at Gaspe, but no authoritative announcement of such intention has ever been made.

Then there is the St. John Valley Railway, the route of which is now being surveyed by provincial government engineers. There has been much talk for many years about a line of railway from Grand Falls down the rich valley of the St. John river to the city of St. John, and it has had its place in many political campaigns. Even now there is not complete harmony between the provincial and federal governments concerning it, though subsidies have been voted and everybody professes a desire to see the work completed. It may be said, however, that the project has been so far advanced that it cannot be long before some plan is adopted to provide the valley people with railroad accommodation.

When the Valley Railway is built, and the Grand Trunk Pacific in operation, along with the Intercolonial and its branches, the C.P.R. and branches, the Intercolonial and the New Brunswick Southern, the province of New Brunswick will be fairly gridironed with railways, making it about the best served in that respect of any province in Canada. Nowhere will the settler be far removed from the railway and the conveniences it brings, while the wide-reaching service should give a decided impetus to the development of provincial resources.

Controller Ainey, of Montreal, has a unique proposition to lay before the Board of Control of that city. The proposal is for the city to build workingmen's tenements or cottages and to rent them at a moderate figure. Mr. Ainey states that the venture has proved a success in England and other countries.

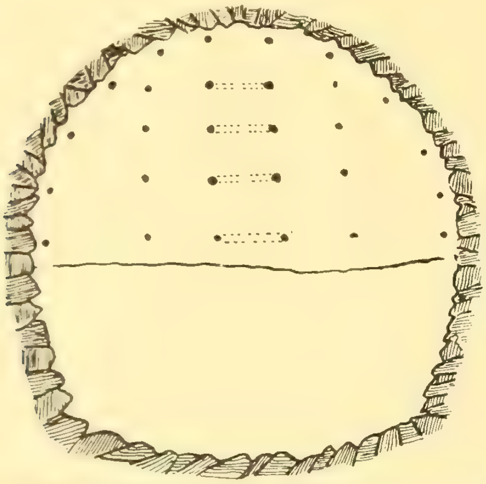
Mr. A. R. Dufresne has been appointed to the position of Assistant Chief Engineer at the Department of Public Works, Ottawa. For some time Mr. Dufresne has been District Engineer of Public Works at Winnipeg. In this capacity he will be succeeded by Mr. W. Z. Earl, formerly of St. John, N.B.

Even the convicts are to be accorded the privilege of taking part in the good roads movement. In conformity with a recent enactment of the Ontario Legislature, a number of prisoners, chained in two's, left North Bay last week for Matheson, Ont., where they will commence work on the highway to the Porcupine gold fields.

Water tank collapses seem to be quite the fashion in the building world now. We read that a water tank on a factory in a Pennsylvania town dropped through the roof and wrecked the building, injuring 16 men more or less seriously. This is the fourth disaster of the kind since the "Herald" fatality in Montreal. This is remarkable in view of the fact that until a short time ago there had been so little trouble from this source. Building accidents, like diseases, appendicitis, tuberculosis and so on, seem to have their cycles, their periods of ascendancy and decline.

Heading and Bench Methods in Tunnel Work

An interesting example of what can be accomplished by the judicious use of powder and gelatine is to be found in the Southwest Lake & Land Tunnel, at present under construction for the city of Chicago, says "The Contractor," The work in connection is being done by George W. Jackson, Incorporated. At the present time this tunnel extends one mile and a half under Lake Michigan, the entire bore being through tough limestone. When completed the tunnel will extend 11,000 feet under the waters of the lake and 1,265 feet under the land side, making a total of 12,265 feet. The estimated cost for the entire piece of work is $1,581,090. The work is being done by means of blasting, the tunnel section in the rough being about 16 feet, and the customary heading and bench methods are being employed. The heading and bench are about equally divided, and four Ingersoll-Rand air drills mounted on columns are used in the heading, equipped with cross bits. From April 1 to May 1, 1909, in 27 working days there were driven in the heading 468 feet, establishing a daily record of 17½ feet, which is considered the world's record. There are eight centre cut holes, with four helpers on either side, while to force the remnant twelve rim holes are drilled around the outside. The bench is removed with eight vertical holes, no lifters being used. In order to break this it requires an average of 225 pounds of 60 per cent. Du Pont gelatine. It takes an average of 1½ hours to blow out and load the holes, which are filled about three-quarters. The men work in two shifts, shooting each shift. Each driller has a helper who arranges steel and makes himself useful in a general way, though generally manipulating the feed screw. The charge is set off electrically, the current from the 110-volt light circuit being used for that purpose. When the blast has been made, a blower is turned on which quickly sucks out the gases remaining in the bore. A feature in connection with this work is the fact that few noxious gases are generated by this type of gelatine. The drillers do their own mucking back for the set up and in turn are assisted by the mucking in tearing down. Very complete reports are kept of this work, a record being turned into the office every hour showing the distribution of all forces and covering every portion of the work. This system was introduced to catch the least leakage in the matter of cost. One blacksmith is sufficient to keep both shifts supplied with the necessary steel.



Location of holes Southwest Land & Lake Tunnel for heading

The State Highway Commissioner of New Jersey in his annual report says that the application of oil upon roads for laying the dust has had a marked effect in driving away mosquitoes.

Town Planning Conference

The Exhibition Committee of the Town Planning Conference of the Royal Institute of British Architects would be glad if architects and others possessing drawings or models illustrating town planning design, which they would be willing to lend for exhibition, would send particulars thereof to Mr. John W. Simpson, Secretary-General of the Conference, 9 Conduit street, Regent street, London, W., at as early a date as possible. The space at the disposal of the committee being limited, they are unable to accept illustrations of buildings other than such as have a definite connection with the subject of town planning.

Technical Education Commission's Exhaustive Tour

The itinerary of the Technical Education Commission has been completed. The first sittings will be held at Halifax, N.S., on July 18, 19 and 20, and others in the Maritime Provinces as follows: Lunenburg, July 22; Liverpool and Yarmouth, 23; Digby, 25; Middleton, 26; Kentville and Wolfville, 27; Windsor, 28; Truro, 29; Sydney and district, August 1, 2 and 3; New Glasgow, 5; Pictou, 6; Charlottetown, 7 and 8; Summerside, 10; Amherst, 12; Shediac, 14; Moncton, 15 and 16; Sussex and Hampton, 17; St. John, 18 and 19; Fredericton, 22; Woodstock, 24.

The commission will then go to the Toronto Exhibition.

The Quebec and Ontario dates are: Quebec, Sept. 13 to 15; Three Rivers, 16; Sorel, 17; St. Hyacinthe, 18; Sherbrooke, 20; Montreal and Valleyfield, 21 to 28; Ottawa and Hull, Sept. 29 to Oct. 3; Lachute, 4; Smith's Falls, 5; Cornwall, 6; Brockbille, 7; Kingston, 11; Belleville, 12; Peterboro, 13 and 14; Toronto, 17 to 20; Barrie and Orillia, 21; Hamilton, 24 to 26; St. Catharines, 27; Niagara Falls, 28; Brantford and Paris, Oct. 31 and Nov. 1; Galt, Nov. 2; Berlin and Waterloo, 3 and 4; Guelph, 5 and 7; Stratford, 8; Woodstock, 9; London, 10 and 11; St. Thomas, 14; Chatham, 15; Windsor and Walkerville, 16.

The commission will then go west and stay there till the end of January. On the way back St. Louis, Chicago and Milwaukee will be visited. The commission early in February will go to the Eastern States and then sail for Europe.

The bricklayers' strike at Montreal remains unsettled. While a number of the smaller contractors have agreed to the closed shop principle all the larger firms are standing firm. These declare that if necessary they will bring men from England, although they have a fair supply of men now. The contractors who have signed the demands of the men are mostly in a small way of business.

The Civic Power Committee at Winnipeg are thinking of securing a business manager for the power plant. It is not proposed to have an electrician, but a thoroughly practical man who can arrange rates for the sale of power. First class salary will be paid to the right man. If the recommendation passes the city council, applications will be invited for September 1st, duties to commence October 1st.

The sewage disposal works at Leeds, England, for which the city has recently acquired 600 acres of land, will cost about $6,214,000, according to a recent Consular Report. The process will include sedimentation, chemical precipitation and treatment on percolating filters. From the works the effluent will flow into the River Aire through a channel ¾-mile long. About 200 acres of the site, it is said, will be utilized for the sludge beds and pressing plant.

From the Federal Capital

Labor Matters Being Adjusted—Ottawa Architects want Government to Standardize Brick—Shortage in this Line

Correspondence of the "Contract Record,"
Ottawa, July 18th, 1910.

There was a tendency in the building trades this year to settle the differences between contractor and employee on July 1st instead of May 1st. While there were no actual changes of wages in these trades on May 1st, July 1st saw two important changes and one pending.

The most important was the change with the plumbers. The journeymen plumbers asked for an eight-hour day the year round, instead of nine, and four hours on Saturday. They also demanded a minimum wage of 43 cents an hour, instead of 36 cents. However, the two parties got together and effected a compromise. An agreement was signed giving the journeymen plumbers a minimum wage of 39 cents an hour. Eight hours is to make up the day from Nov. 1st until May 1st each year, with four hours on Saturday. The remainder of the year (the summer months) they will work nine hours and five hours on Saturday. The agreement is to last for 18 months, and unless a three months' notice is given, will continue from year to year afterwards.

The sheet metal workers also asked for a raise. It was decided, however, to allow 30 cents an hour minimum wage to remain in force until Jan. 1st, 1911, when it will be moved up to 35 cents an hour. The hours were not fixed but will work out much the same as the plumbers are.

The plasterers are asking for a raise of five cents an hour on their present minimum rate, which is about 40 cents an hour. A compromise, however, is expected.

Ottawa Also Short of Brick

All the season there has been an appreciable shortage in the brick supply in this city. One architect had nine jobs held up for some months owing to inability to get brick, and still has two of them inactive on this account. However, the different firms, both in the city and in the surrounding towns, are making a strenuous effort to catch up, and it is believed that by the end of the month there will be little trouble from this source.

Some of the builders and architects are complaining of the variations in the size of brick. Especially was this noticed when contractors had to pick up a lot here and a lot there to keep things going until their regular orders were filled. Not only do the brick vary in the depth of the frog, but often neighboring brick manufacturers are making brick of different dimensions. Some of the architects are in favor of the Government fixing a standard size. There is no scarcity in any other building supplies.

Work on the new museum is nearing completion. Mr. George Godwin is the contractor. The main tower section of the building settled somewhat more than the remainder of the building, which caused cracks to extend from the main floor to the top on each side of the junction of the tower wall to the main wall. However, as this only affects the inside it is not expected that it will injure the building. Mr. Ewart, Chief Government Architect, states that all the settling is stopped now so that there is no danger of trouble. He says that he anticipated this settling, and there is no blame attachable.

At a recent meeting of the executive of the Vancouver Tourists' Association, initial steps were taken to formulate a plan for the development of the city along the modern lines of utility, healthfulness and art. It was considered by the members of the executive that such a plan should be adopted as early in the history of the city as possible, in order to assure its growing and developing along modern lines and with a view to its future greatness. At the present time there is not any plan set down that could be followed, nor does there seem any great desire to follow a plan that would add to the general attractiveness and healthfulness of the city. The secretary, Dr. Elliott S. Rowe, was instructed to prepare all the information obtainable as to what is being done in other cities in this direction, and to submit this to the executive of the association. It is likely that a league as a department of the Tourists' Association or as a separate body will be organized to promote the adoption of the measure described.

Banner Year at Winnipeg

Some Shortage of Labor, but no Material Delay Thereby — Supplies Available at Right Prices

Office of the "Contract Record,"
Winnipeg, July 16th, 1910.

With the building season little more than half gone, there are in Winnipeg now more than $7,000,000 worth of uncompleted buildings. This volume of building has naturally drained the labor supply to the last laborer and has resulted in the opening of a number of new building supply houses in the city. Despite the unprecedented pressure of the demand on every branch of the trades, there has been little delay in the schedule of contracts. Individual contractors have on hand at present as much as $2,000,000 worth of work but report progress favorable and prospects good for finishing inside the time limits.

Materials, while not plentiful, are to be had in quantities sufficient to meet the requirements of the trade from week to week and prices have dropped from the inflated figures asked during spring to the regular mark which makes profit possible.

The condition of the city at present presents a spectacle unrivalled even by the banner year of 1906. Vacant properties in every section of the limits are giving birth to substantial structures and even the heart of the city, which previously seemed well built up, it dotted with innumerable evidences of the building prosperity which has grasped the city this year.

Scarcely any of the ten and a quarter millions of dollars' worth of work commenced this year is yet completed, and from this fact the demands on the building trades can be readily estimated. The city has been singularly free from labor disputes, as the scales of wages paid are up to the demands of artisans, and contractors are generally willing to pay equitable wages for competent men. The painters, whose strike is not yet officially settled, are practically all back at work with other employers, while non-union men have taken the places of the strikers in the old shops.

Apartment blocks, which have been the feature of the building season, are getting well toward completion in many sections of the city. This class of building is generally started early in order to cater to the fall return of tenants to the city. A few such structures were held up for a couple of weeks during the early season by the scarcity of brick, but overtime has brought the work up to schedule. On several of the larger works, overtime has featured progress. Where men could be obtained to do the work the contractors have attempted to get the contracts off their hands as rapidly as possible, hence the overtime.

The building situation is, generally speaking, the best yet experienced and the outlook for the Canadian record for the year, from this angle, at present appears almost certain.

The total building returns for the year to July 15th, are $10,238,650; representing 2,355 buildings and 1,928 permits.

Trade News from Montreal

Present Strike an Injustice to Master Builders—Permanent Committee Appointed by Exchange—The Supply Market

Montreal Office of the "Contract Record,"
July 18th, 1910.

The strike of the Montreal mason and brick contractors, involving as it does such an important department of the building trade in this city, forms the feature of the local building situation at the present time.

This move on the part of the members of the local union, coming as it did in the midst of a prosperous building season, was most unfortunate and has already been detrimental, in general, to the building interests of this city.

The strike is the more unfortunate because of its apparent injustice to the master builders of Montreal, and their stand in refusing to bow to the demands made upon them is most admirable. In the first place, the strikers are not out because of a general dissatisfaction with the prices paid for their labor. In point of fact, contractors were paying their men according to their different abilities and we understand that it was possible for good men to earn as high as 60 cents per hour. Rather are they striking for the recognition of certain principles, a closed shop, etc., the salient features of which at the best are not quite clear.

In the meantime the master builders have taken a firm stand in respect to this question and have refused to recognize the demands made by the union. Construction work is, as a result, proceeding with a lack of the vim which should characterize it at this season of the year with such a large number of contracts on hand. Concrete work, however, is not affected and an extra activity is reported in this direction.

The local union is being backed up in their fight by the International Union, whose headquarters are located in the United States, and the money which is being distributed in support of the movement is largely forthcoming from this source.

J. H. Bernier, president of the strike committee, claims that 130 contractors have acceded to the demands made by the union and have signed a two years' agreement to that effect. This, while partially admitted by the master builders, means practically but little when it is considered that these contractors mentioned are the small men, a great number of whom do their own work, and who altogether do not employ as many of the strikers as would any one of the larger contractors holding out against the demands of the union.

The headquarters of the master builders is the Montreal Builders' Exchange, and during the past few weeks Secretary J. H. Lauer has been an exceedingly busy man. A permanent strike committee has been appointed to receive any overtures which the strikers may make and consists of the following members of the Exchange: Messrs. E. G. M. Cape, J. P. Anglin, James Murphy and H. R. Hutchison, all prominent members of the local contracting firms.

Just how long the present conditions will last is difficult to figure, but it is generally considered that the dwindling of the strike funds will find the masons and bricklayers in a different frame of mind and more ready to consider propositions concerning a return to their neglected work.

News of Supply Market

In general, local supply markets have not been particularly active during the past fortnight, and this must be attributed to the unsettled conditions of the labor situation.

Cast iron water pipe continues in good demand with prices ranging as follows, f.o.b. Montreal, per net ton: 4-inch, $32.50; 6-inch, $32; 8-inch, $31; 12-inch, $30.

Cement has all through the season moved quite freely and from the headquarters of the Canada Cement Company, we learn that the demand is excellent at present. According to Mr. W. H. Forde, sales manager of the Canada Cement Company, prices of local cement remain unchanged while during the past two months United States markets have made two strong advances. Prices are as follows, f.o.b. Canadian centres (exclusive of cost of package): Montreal, $1.40; Toronto, $1.60; Fort William, $1.50; Winnipeg, $2.20; Calgary, $2.60; Ottawa, $1 40; Halifax, $1.50.

Montreal Park Commission

At a special meeting of the Provincial Cabinet held at Quebec recently the Metropolitan Parks Commission was appointed. This commission is to be composed of the following members: J. L. Perron, K.C., M.L.A. (chairman); Sir William Van Horne, Controller E. P. Lachapelle, W. D. Lighthall, K.C., Mayor Alexander Michaud, of Maisonneuve, J. A. David and J. C. Walsh, Montreal.

The appointment of this commission was sanctioned by a special Act passed by the Legislature last session and was appointed to study the question of the establishment of a system of parks and boulevards throughout the island. They will receive all suggestions and will collect information regarding the probable cost and other details of such plans. They are empowered to hear experts and to visit other places for the purpose of inspecting park systems, which have been established. They will make a report which will be considered by the Government and submitted to the Legislature next session, when a bill will probably be introduced authorizing the commission to go ahead with the work which they have mapped out.

The cost of the commission is to be divided between Montreal and the other municipalities of the island, the city, of course, paying the largest share. The commissioners will receive no salary, but the secretaries of the commission will be salaried officials and will devote their whole time to the work.

Several plans for boulevards and parks have been submitted already, including one by Mr. William Lyall for a boulevard through the city, which has met with popular favor and which will likely be one of the first plans considered by the commission. His scheme, which has already been described in these columns, provides for a wide boulevard from east to west through the city, following the present line of Ontario and Burnside Place, which may ultimately be extended throughout the length of the island.

New Land Surveying Office

Mr. Malcolm D. Barclay, who has been associated with Mr. Jos. Rielle for some years, has opened an office in the Lake of the Woods Building, where he will continue his profession as land surveyor and civil engineer. Mr. Barcley is a graduate of McGill University and a member of the Corporation of Quebec Land Surveyors.

Marriage of Mr. William S. Leslie

Mr. William S. Leslie, president of the firm of A. C. Leslie & Company, Limited, and Miss Margaret Wilson, daughter of the late James R. Wilson, of Sanquhar, Scotland, were married on June 15th. The ceremony was conducted in St. Helen's Church, Sanquhar, by the Rev. J. Richmond Wood, assisted by the Rev. J. Scott, of Toronto. Mr. and Mrs. Leslie are expected in Montreal about the end of August. The "Contract Record" extends heartiest congratulations.

Montreal Dry Dock Plans

An Ottawa dispatch of recent date says that the application of Vickers, Sons & Maxim for a dry dock subsidy at Montreal will probably not be finally dealt with by the Cabinet Council for some time yet, pending the examination of plans, etc., by the engineers for the Public Works Department and a report thereon.

Notes

According to an estimate recently prepared by the road department it will take seven years and cost $20,000,000 to

The Best HOIST in Canada

Note Well the Exclusive Features

The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy

or any kind of

Glazing Glass

The

Consolidated Plate Glass Co.

of Canada, Limited

TORONTO MONTREAL WINNIPEG

Granite Marble
Tiles Slates

Ceramics
Marble Mosaics
Marbleithic Tiles
Wall Tiles
Quarries

We carry a stock of above materials in Montreal and are prepared to supply the trade at lowest prices.

The Smith Marble & Construction Co.
Limited
The Calkins Tile & Mosaic Co.
Limited
458 Bleury Street, MONTREAL, QUE.

Phone Main [illegible]

The

Roofers Supply Co.

Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces

CRUSHED STONE—Dimension and Coursing Stone, Lime.

FIRE BRICK **IVORY CEMENT PLASTER**

Yards

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

complete street paving work throughout the whole city, the newly annexed wards included.

The Montreal Board of Control has decided that half a day each week shall be devoted to inspection of the numerous paving works that have been given out to contractors. It is the intention of the board to personally see that contractors carry out their agreements to the letter.

The Board of Control have accepted the tender of Messrs. Keegan & Dillon for the construction of the last section of the Sherbrooke street sewer. The figure at which the contract was awarded is stated as approximately $70,000.

The Board of Control have presented a report asking for power to purchase a piece of land in the east part of the city upon which a high level pumping station may be established. This, it is understood, is to be used merely as a supplementary plant which can be brought into service in case the sewers shall at any time become flooded.

The big Mallet compound engine recently constructed at the Angus shops, to aid in getting freight trains over the grades of the C.P.R. in the west, is reported to be doing fine work, and it is stated that orders have been given to construct five engines of this type at the Angus shops for similar service.

Plans for the Dominion Express Company building, which is to be erected on the site of the St. Lawrence Hall at a cost of $600,000, were recently approved by Mr. Alcide Chausse, city building inspector.

Permits for extensions to the Windsor and Place Viger stations have been taken out at the building inspector's office by the Canadian Pacific Railway Company. The cost of the alterations to the Windsor station is estimated at $1,250,000 and to the Place Viger at $200,000. The city percentage for issuing these permits amounted to $727.

Mr. Chausse, city building inspector, has received to date about 60 reports concerning the conditions of different local water tanks. In all there are slightly more than double this number of tanks within the city. In the majority of cases the engineers making the inspections have found construction conditions satisfactory, although in some instances minor alterations have been recommended.

July 12th proved a record day at Building Inspector Chausse's office, when permits aggregating approximately a value of $2,075,000 were taken out. The plans for the Windsor street station, additions to the Place Viger station and hotel, together with those for the Dominion Express building were presented for civic inspection and were responsible for the biggest day in Mr. Chausse's recollection.

Mr. W. E. Ramsay, sales manager for the Pedlar people, has recently closed several important contracts for the installation of reinforcing material. These all call for the use of Clinton electrically welded fabric, supplied by his company. Included in these contracts are the Guaranteed Pure Milk Company's new building, St. Catherine street; extensions to Imperial Breweries; Alexander school; Earl Grey school; William Dawson school and Waldemere Apartments, St Matthew street.

Preparations are well under way for the International Municipal Congress and Exposition, to be held in Chicago September 18-30, 1911. Attendance at this meeting is expected on a large scale from the 150 or more organized bodies which are giving special attention to municipal and civic interests. Many delegates are expected from foreign countries. The work of the Congress will not be confined to the larger cities. A special effort will be made to interest municipalities of 5,000 or more inhabitants. Papers bearing on the different phases of municipal work will be read by men of international prominence in the respective departments. Mr. C. M. Treat, 1107 Great Northern Building, Chicago, may be addressed for further particulars.

Personal News and Notes

City Engineer Cameron, North Vancouver, B.C., is stated to have resigned.

The new town engineer of Berlin, Ont., is Mr. H. Johnston, A.M.Can.Soc.C.E.

Dr. Sheard has been re-appointed Medical Health Officer for Toronto at a salary of $6,000 a year.

At a recent meeting of the Bricklayers' Union of Toronto, H. Fussell was elected president and R. A. Watson, recording secretary.

The time for receiving plans for the new Government House at Toronto has been extended until August 10th. The closing date was originally July 15th.

At the half yearly meeting of the Winnipeg Bricklayers' Union, W. R. Weston was elected president and J. H. Poulter business agent and financial secretary.

Mr. R. S. Scott, Toronto, president of the International Stonemasons' Union, died recently. The late Mr. Scott came to Canada six years ago from Scotland and was only in his 36th year.

The Board of Control at Montreal means business. It has decided that half a day during each week shall be devoted to an inspection of work being carried out by paving contractors.

Mr. T. J. White, one of Winnipeg's pioneer building contractors, died in that city last week at the age of 58 years. The late Mr. White was a native of Creemore and took up residence in the western metropolis in 1880.

Mr. Fred McCourt, formerly private secretary to the Deputy Minister of Railways, and who accompanied Mr. M. J. Butler to Sydney, has been appointed assistant sales agent of the Canadian Steel Corporation at Montreal.

We are pleased to note that Mr. A. C. D. Blanchard, who has charge of the main drainage works for the city of Toronto, is again fulfilling his official duties. Mr. Blanchard has just recovered from an attack of appendicitis.

The death occurred recently of Mr. T. F. McGuigan, who was city clerk of Vancouver for the first 20 years of the city's history. Mr. McGuigan was a native of North Easthope, Perth county, Ontario. He was in his 50th year.

The competition for plans for the Carnegie Library at Hamilton resulted in the acceptance of the design of Mr. A. W. Peene, of Hamilton. Mr. Jno. M. Lyle, Toronto, was awarded the second, and Messrs. Stewart & Witton, Hamilton, the third prize.

Mr. Bernard O'Byrne, for the past 30 years an inspector of the Public Works Department for the Province of Ontario, died on the 9th inst., at his residence in Toronto. In his official capacity he superintended the erection of the Parliament Buildings and the School of Practical Science, Toronto, the Brockville Asylum, and many other important public buildings throughout the province.

Mr. A. W. Campbell, Deputy Minister of Railways and Canals, has been appointed by the Dominion Government to attend the second International Road Congress at Brussels from July 31st to August 7th, as representative for Canada. Mr. Campbell is one of the committee which will represent the American Road Builders' Association, which includes in its membership practically all the State highway officials in the country. The other members of the committee are Samuel Hill, of Seattle, and E. L. Powers, of New York.

A contract has been let to Peter Lyall & Sons for the construction of what will be, when completed, one of the largest office buildings in Montreal. The site is the corner of St.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

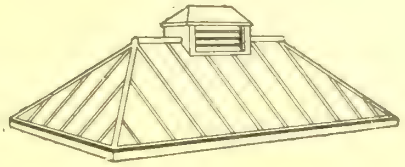
50 Pacific Avenue - - West Toronto

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

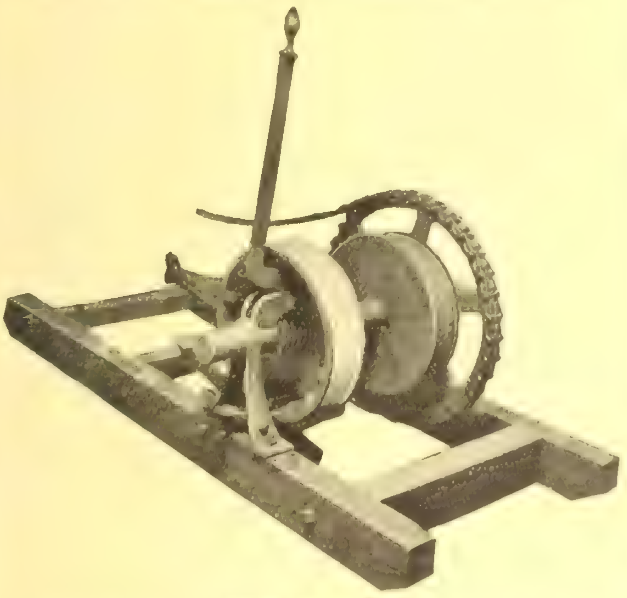
Information and prices on request.

Manufacturers

1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses:

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited

Engineers and Machinists London, Canada

We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

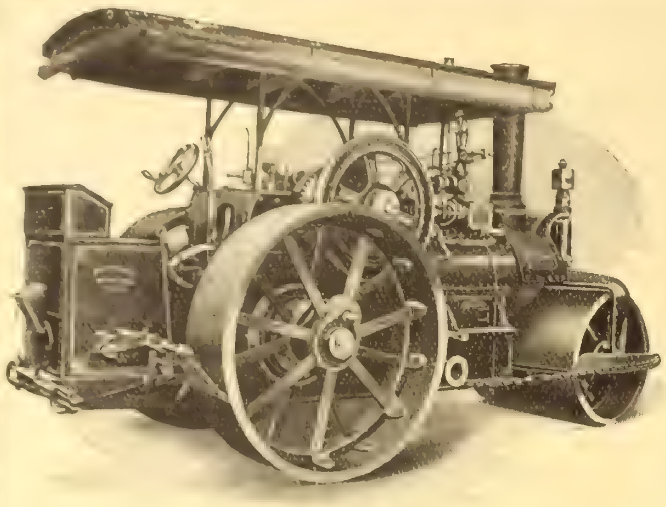
We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO



The Waterous

A Canadian Roller for Canadian Roads

This Roller is known as "a Good Roads Pioneer" from Vancouver to Sydney. Fully illustrated and described in our new 20 page catalogue No. 301. Send for it.

The Waterous Engine Works Co., Limited
BRANTFORD, CANADA

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

ESTABLISHED 1886
Contract Record
with which is incorporated
Architect & Builder

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, Confederation Life Building, Toronto.

James and St. Francois Xavier, running through to Notre Dame street, having an area of about 17,000 square feet. The building will be controlled by a company headed by Mr. J. N. Greenshields, who was successful in carrying out the negotiations with the seminary from whom the property was obtained. The building will cost in the neighborhood of a million dollars.

Mr. R. W. Leonard, of Cobalt fame, vice-president of the Canadian Society of Civil Engineers, has been appointed a member of the Board of Governors of the University of Toronto. Mr. Leonard, who is a graduate of the Royal Military College, Kingston, was born at Brantford, and is about 50 years of age. He was for more than 25 years a prominent figure in civil engineering circles. As chief engineer of the Canadian Pacific he was in charge of several important contracts. Mr. Leonard also played an important part in the construction of the lines between Montreal and Ottawa, and Toronto and Ottawa. Other important work was undertaken by him as chief engineer of the Cape Breton Railway. He has also been connected with many large hydraulic contracts, among which were the plants for the Kaministiquia Power Company at Kakabeka Falls and the plant of the Dominion Power & Transmission Company at Hamilton.

Chlorine Treatment of Sewage

Apropos of the above proposition, now under consideration at Toronto, Mr. Fred Chestnut, C.E., formerly engineer in charge of the experimental plant at Stanley Park and now at the filtration plant on the Island, expresses the opinion that some sort of experimental plant should be constructed for this purpose. "Why should the city undertake the equipment of a huge sewage treatment station without first conducting a lot of experiments on a small scale?" asks Mr. Chestnut. An experimental plant could be built for a few thousand dollars. With such an installation the most important data could be established with regard to treatment of the conditions we have to contend with here. The city would then know exactly what was required in the big structure. Erecting it, as is the intention now, without any such previous investigation, is almost certain to mean the remodelling of some feature of the plant which will be found inadequate for its purpose at probably a much greater expense than would have been entailed in the primary erection of an experimental station.

The London Concrete Machinery Company, Limited, 19 Marmora street, London, Ont., have favored us with an interesting and exhaustive catalogue setting forth the advantages of their various products. This company manufacture concrete mixers, concrete block machines, concrete brick machines, concrete sill, step and window cap moulds, stone crushers, concrete sewer pipe and culvert moulds, concrete silo curbs, concrete silo block machines, etc. A machine which has done wonders for the reputation of the firm is the London automatic continuous batch concrete mixer, a mixer which it is claimed will pay for itself over hand mixing with 30 days' use. See this firm's advertisement and write them, mentioning the "Contract Record."

The following is a list of recent Canadian patents relating to contractors' appliances and building trades. Furnished by Fetherstonhaugh & Company, 5 Elgin street, Ottawa. (Russel S. Smart, resident):

125,327—Ed. Mohun, Victoria, B.C.; metal reinforced concrete piles.

125,365—L. S. Van Westrum, Brantford, Ont.; drills for road work.

125,983—P. J. Weekes and F. A. Drummond, London, Ont. —Shelf locking extension ladders.

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co.

Limited

Campbellford, Ont.

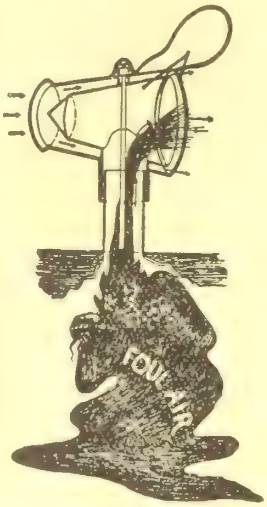
Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings
Roof Trusses
and other Structural Steel

Foundry and Machine Shop in connection.

Estimates on application

AUTOFORCE
VENTILATING SYSTEM



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

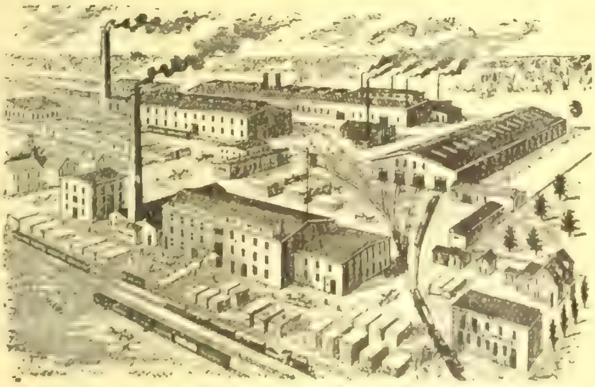
THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA:

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

Rhodes, Curry Co., Limited
Lessees



Bank and Office Fittings
SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

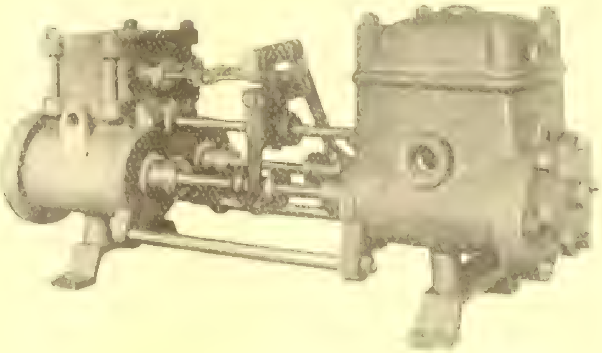
In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N.S.

BRANCHES AT
Halifax Sydney

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
Bridge and Construction Dep't.
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

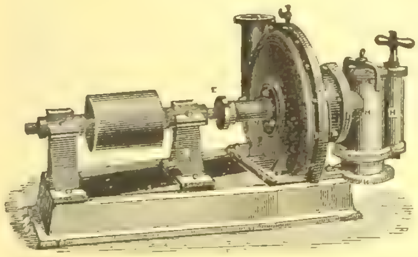
Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

M. Beatty & Sons, Limited

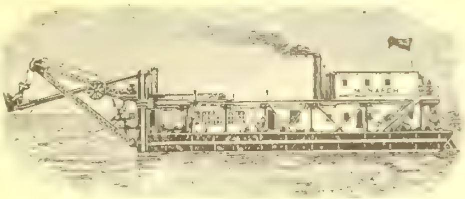
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

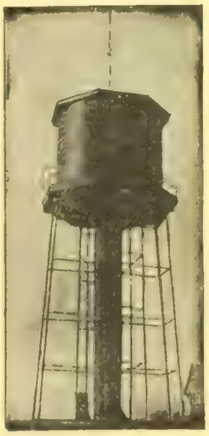
SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer
Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**

Office Phone P. 64 Residence P. 1040



Steel and Wood TANKS

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

Manufactured by
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

For all High Class Decorations Churches, Hospitals, etc.

USE

Satinette
White Enamel

A perfect white finish—never turns yellow

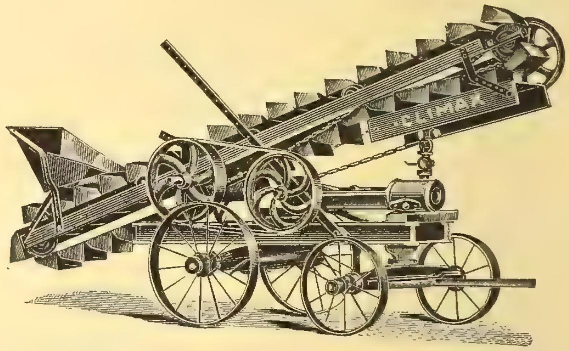
Satinette should invariably be chosen where elegance and a suggestion of spotless cleanliness is desired. For beauty and daintiness there is nothing to equal it. Satinette is snow white and retains its perfection permanently.

Our booklet "Satinette, the Perfect Finish", will interest you. Send for it to-day.

All packages are full imperial measure

INTERNATIONAL VARNISH CO.
Limited
Toronto Winnipeg
2506

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER-

All sizes ready for shipment.

Catalogues furnished on application.

The
Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

SUCCESSORS TO:
Canadian Iron & Foundry Co., Limited
Canada Iron Furnace Co. Limited
Annapolis Iron Co., Limited
John McDougall & Co., Drummondville

Head Office: Montreal, P. Q.

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc. Castings of All Kinds.

Dundas Stone

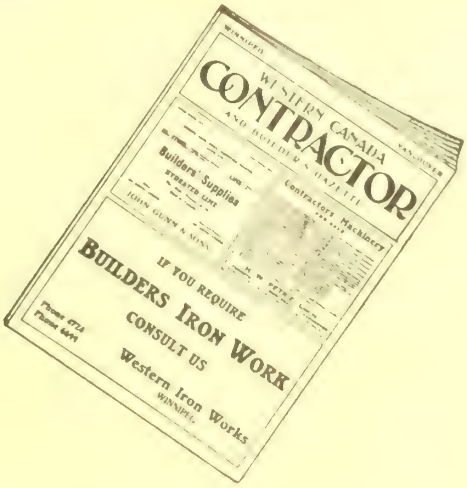
All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

ROCALITE
The Ready Mixed
Hard Wall Plaster
Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U.S. Letters Patent.

Toronto Canada

WE HAVE THE STOCK

Ready for prompt shipment

FIRE CLAY
FIRE BRICK

CEMENT
CRUSHED STONE

BUILDING STONE
BUILDING SAND

GRAVEL, SCREENED, PIT RUN AND PEA GRAVEL

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North { 2107 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**
London, Canada Limited
Toronto Office: 103 Pacific Bldg.

Globe Furniture Co., Limited

Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

Send Plans and Specifications for Estimates

The
Globe Furniture Co., Limited
Toronto Office: 90 Yonge St.
Phone Main 5944
Main Office and Factory: Walkerville, Ont.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

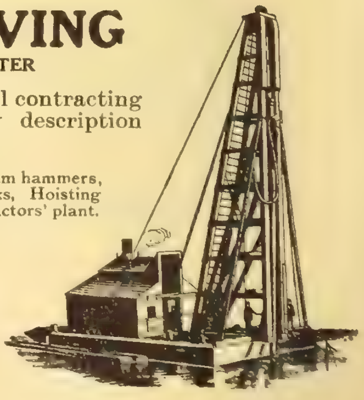
PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

THE WARMEST SHEATHING—WIND AND FROST PROOF
Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal. Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

Canadian Agents
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

55%
WATER
WASHED
SAND
Registered
PURE SILICA

Sand & Supplies, Limited
Main 4507 - - TORONTO

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

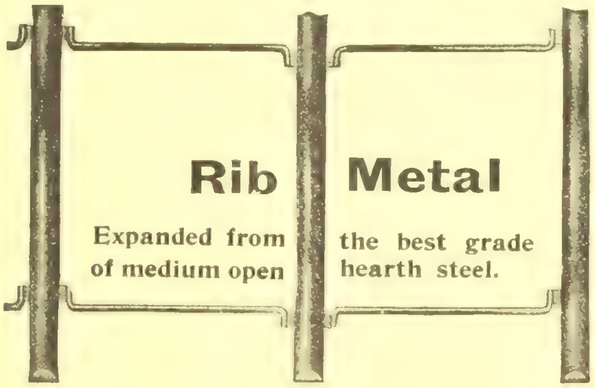
Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.


Rib Metal
Expanded from the best grade
of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited
Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

A. LEOFRED

(Graduate of Laval and McGill)

Civil Engineer

Specialty: **Waterworks**

39 St. John St., QUEBEC Telephone Bell 545.

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA aud H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and
HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

FRANK BARBER, C. R. YOUNG, B. A. Sc.,
York County Engineer. A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The
KATIE
Foundry,
Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole
Frames,
Crossing
Plates,
Special
Castings.

Established 1882

THE COMMERCIAL

The WEEKLY FINANCIAL, COMMERCIAL & GENERAL TRADE NEWSPAPER of the GREAT WEST,

Winnipeg Manitoba

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY CO., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.
67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St. Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work	$10.00 to 11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	8.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 55 cents per square foot up.

Floor Tile—½-inch square 65 cents.

Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color 55 to 65 cents.

Glazed—White, 6 x 8 inches, 55 cents per square foot.

Matt—Dull finish colors, firsts 70 cents.

Capping Coves and corners, special quotations to suit requirements.

Opalite Tile—8-16 inch No. 1 standard, size 6 x 8 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 8 inches, 80 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range.

80-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1 00; 18 x 30 $1.15; 18 x 36, $1 95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b, Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto,

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3,50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents,

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $9.00; sanded, $5.00; hydrated lime, $10.00; bags extra.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs,

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,

Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.

Turpentine, in barrels, 89 cents per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Ferry and Company, contractors, Montreal, Quebec, is stated to have assigned.

Camille Verdon, hardware merchant, Montreal, Que., is stated to have assigned.

King and Heasman, hardware merchants, Wawota, Sask., have been succeeded by Heasman and Rowbottom.

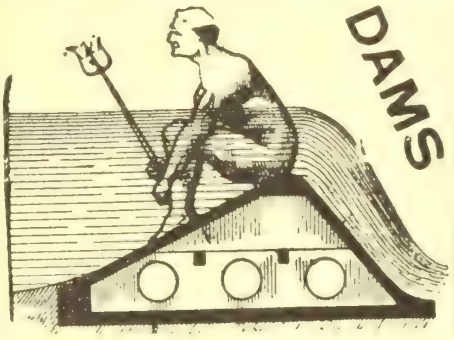
Ed. Cawley, saw mill proprietor, Beaverton, Ont., is advertising business for sale.

G. Deschamps, contractor, Verdun, Que., is stated to have arranged to sell assets.

J. N. McKendry, president Dominion District Steam Heating Company, Limited, Toronto, is deceased.

The Canada Gazette announces that by order-in-council it has been decided that the regulations recently promulgated regarding the survey, administration and disposal of Dominion lands in the railway belt of British Columbia should "become effective on a day hereafter to be appointed."

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**

AMERICAN

ALSEN
CEMENT
45 BROADWAY NEW YORK

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

GERMAN

Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections

See page 155 in "Sweet's" for full particulars.

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

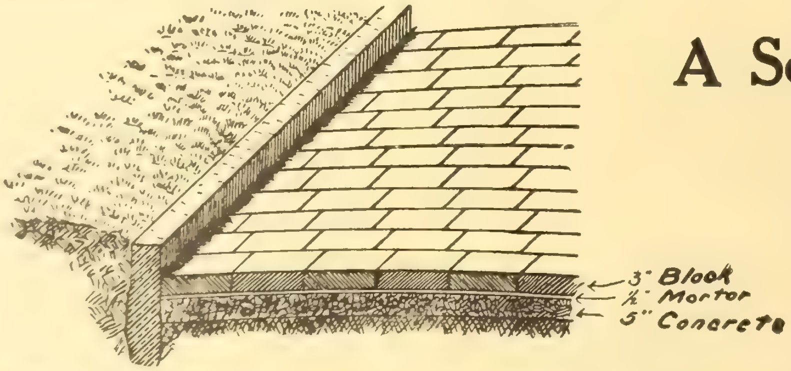
The Last Word in Wire Lathing

1910 Patented Trussed 1910

Wire Lath

FOR DESCRIPTION AND PRICES APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

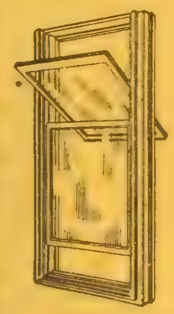
Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

FIREPROOF BUILDINGS

are **not** Fireproof without

FIREPROOF WINDOWS



Specify DOUGLAS BROS.' Fireproof windows on your next contract and insist upon getting them. These windows have been thoroughly tested by the National Board of Fire Underwriters and found to comply with their requirements.

Send for a copy of our interesting booklet.

Douglas Brothers, Limited

Toronto, Ont. - - - - Montreal, Que.

A FULL LINE

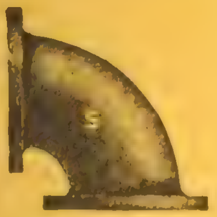
is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow



Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

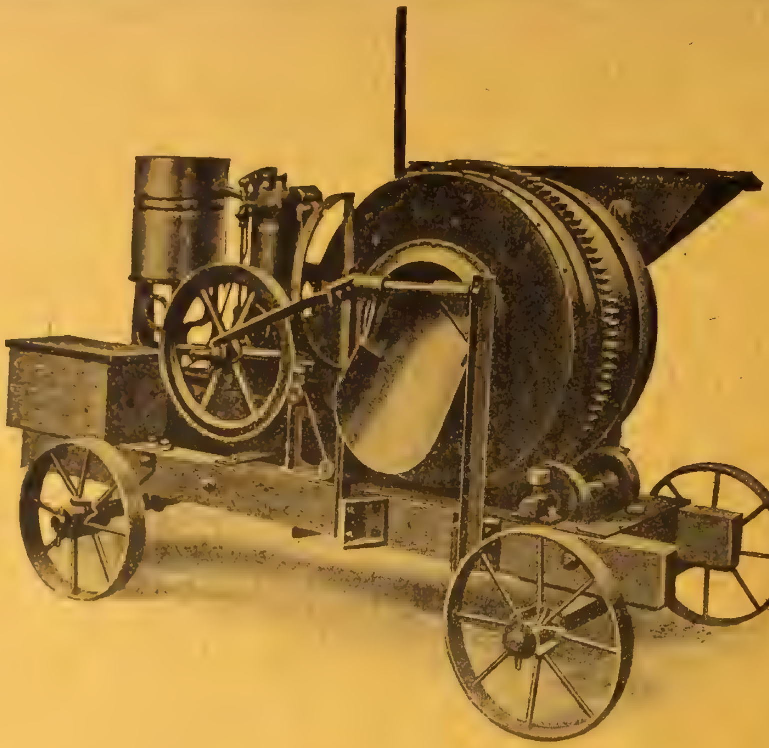
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



This is Every Man's Mixer

NO. 4 RANSOME—NEW 1910 MODEL

At last the demand for a really **small** concrete mixer is satisfied. Hold on, now, Mr. Big Contractor, that doesn't let **you** out, either. This is **Every Man's Mixer**—the mixer that fits into everybody's need. There isn't a concrete job on earth so small that it can't be done better and cheaper with this new model No. 4 Ransome, and there isn't a contractor anywhere whose work is so big that he will not find it a convenience and an economy to have one of these little No. 4's in addition to his larger machines. The No. 4 can be used on the small, isolated parts of jobs where it wouldn't pay to move a big machine.

Everybody who builds concrete walls, concrete walks, concrete **anything**, can have the best concrete that can be made at the least possible cost, because our new No. 4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an **exact reproduction,** on a small scale, of the Ransome that made the correct mixing of concrete **cheap**—it's the same wonderful mixer in miniature. This is **the first really modern, effective, and economical small mixer ever put on the market.**

The following description of the No. 4 Ransome will show you what a truly **complete** and highly efficient mixing outfit you can buy at a very low price.

It has a batch capacity of 4 cubic yards per hour, which is ample for any small concrete job.

It is made and sold in **one way only,** i.e., **mounted on trucks,** with a Gasoline Engine, **direct drive.** This is a powerful engine for its rated H.P. and the best designed—a most perfect-operating engine.

The No. 4 is fully equipped with **Gasoline Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates** and All Necessary Engine and Mixer Fittings—**an absolutely complete outfit, ready for perfect operation.**

The Drum is 36" in diameter and 24½" in length, and has a speed of 24 revolutions per minute.

For its size this is the most substantially built mixer. The drum plates are ⅛" thick; the scoops ⅛" thick; the counter shafts 1 7/16"; the traction rings ½"; face of traction rings 1½".

The mixer has only 16 parts all told and **only four wearing parts.** It is the Extreme of Simplicity—you can keep one extra part on hand—a journal. The journals are the only wearing parts. No danger of breakdowns. It is everlastingly durable and reliable.

The No. 4 Ransome is a great time saver in every respect. The charging hopper is being filled **while the batch is mixing,** so that no time is lost in charging. The batch is instantly discharged by merely reversing the discharge chute.

It is also a great economizer of **time** and **labor** because it is **not a tilting mixer**—it needs no room for clearance—is mounted several feet lower than any tilting mixer—a great saving in time and labor of elevating the materials into the mixer.

The No. 4 Mixer is equipped with a series of blades or scoops inside the drum, which produce a rubbing-grinding contact of the particles in the concrete, a combination of rolling contact with forcible kneading. Being the same in this respect as the larger Ransomes, it follows that the user of the new No 4 Ransome, although mixing in small batches, will get precisely the same **intimate** and **thorough** mixture for which the Ransome is unique. The user of a No. 4 may know positively in advance that his concrete will be a perfect, uniform mixture—sound throughout—no unmixed spots anywhere—no danger of the concrete crumbling after setting.

Because of this thorough mixing, the No. 4 Ransome permits of **real cement economy.** It will give **maximum** strength with the **minimum** cement countenanced by engineers.

The new 1910 Model No. 4 Ransome is small, compact, easily **portable.** Mixer, engine, and trucks complete, weigh 1750 lbs.

We carry No. 4's in our Warehouses for immediate delivery. Write for price, terms and additional information.

We give with each of these mixers an absolute and unequivocal **guarantee** that the No. 4 Ransome under equal conditions will mix more concrete, mix it better, in less time, and with less labor, repairs and expense, than any other mixing device.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, July 27, 1910 No. 30

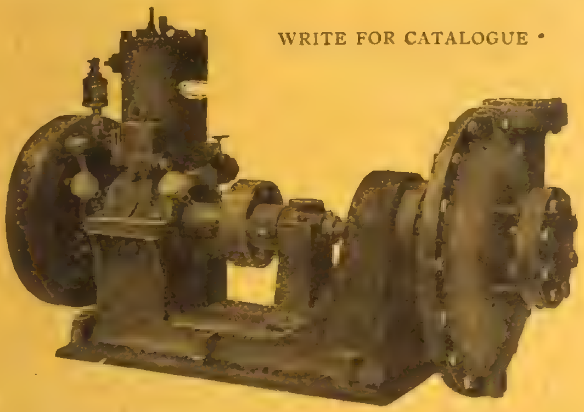
ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps, Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE



The **Smart-Turner Machine Company**
HAMILTON, CANADA Limited

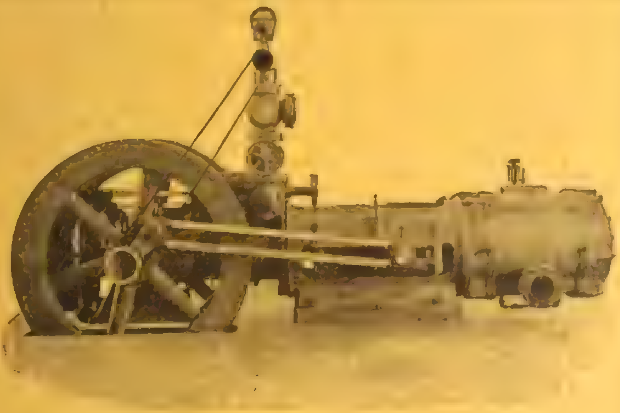
"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

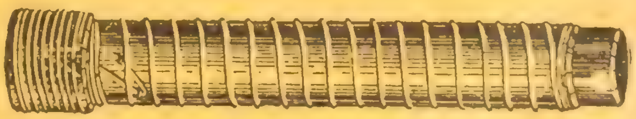
The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO



CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity—Efficient Regulation
Large Bearings—Rigid Construction
Ask for Descriptive Catalog K 84

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

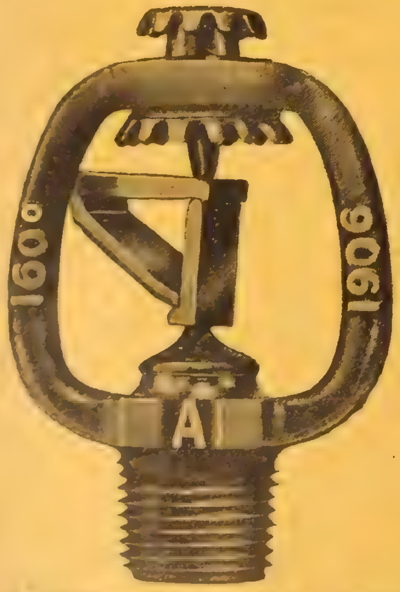
General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

$20,000,000.00!



The "Rockwood" Approved by all Canadian and American Insurance Associations

Canada's Annual Fire Loss.
What Proportion Do You Pay?

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums
For particulars and free estimates communicate with

The Rockwood Sprinkler Co., of Canada, Limited, Montreal

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Automatic Sprinklers Page
Rockwood Sprinkler Co 2

Architectural Iron Work
Canada Wire Goods Mfg. Co. 15
Dennis Wire & Iron Works.......... 58

Boilers
Inglis, John 22
Jenckes Machine Co.... 2
Marsh & Henthorn 53
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co 63
Waterous Engine Works Co.......

Brick
American Enamelled Brick Co.......
Canadian Pressed Brick Co... 59
Don Valley Brick Works.......... 7
Hamilton Pressed Brick Co........ 10
Milton Pressed Brick Co............
Port Credit Pressed Brick Co......... 59
Toronto Pressed Brick Co. ....

Bridges (Steel)
Canadian Bridge Co................ 54
Cleveland Bridge Co................. 54
Dickson Bridge Works..............
Dominion Bridge Co................ 54
Phoenix Bridge and Iron Works.... 55
Pennsylvania Steel Co. 54

Builders' Hardware
Taylor-Forbes Co.................... 63

Cement
Alsen Portland Cement Co.......... 62
Britnell & Co 58
Bremner, Alex...................... 57
Canada Cement Co 3
McNally & Co., W.................. 59
Morrison & Co., T. A............... 60
Rogers, Alfred.......... 4
Rogers Supply Co.................. 31
Sand and Supplies................. 59
Stinson-Reeb Builders Supply Co.... 58

Conduits Page
Conduits Co., Limited.......... 58

Concrete Mixers and Machinery
Canada Foundry Co............... 14
Cropp Concrete Machinery Co...... 6
Goold, Shapley & Muir...... 9
Hopkins & Co., F., H.............. 64
Jenckes Machine Co................ 2
London Concrete Machinery Co...... 21
Mussens Limited................... 32
Morrison & Co., T. A.............. 60
Rogers Supply Co.................. 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co..................... 55
Canada Wire Goods Mfg. Co..... 15
Hamilton Iron & Steel Co...........
Trussed Concrete Steel Co........ 13

Contractors' Plant
Beatty & Sons, M. 55
Hepburn, John T................. 17
H. & E. Lifting Jack Co..........
Hopkins & Co., F. H.............. 64
Katie Foundry Co.................. 60
Marsh & Henthorn................ 53
Mussens Limited................... 32

Crushers (Stone and Rock)
Hopkins & Co., F. H................ 64
Jenckes Machine Co................. 2
Mussens Limited................... 32
Morrison & Co., T. A.............. 60

Corrugated Iron
Galt Art Metal Co...................
Metallic Roofing Co................ 51
Metal Shingle and Siding Co....... 20
Ormsby, A. B., Limited............ 5
Roofers Supply Co................ 53

Contractors Page
McIlwraith, Jas. A................ 60

Drills
Beatty & Sons, M 55
Canadian Rand Co.................. 1

Drilling Contractors
Harvey, J.......................... 61

Dredges
Beatty & Sons, M 55

Engines
Inglis, John 22
Jenckes Machine Co..... 2
Mussens Limited........ 32
Waterous Engine Works Co........

Excavators
Harris, J. W......................... 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co......... 34

Engineers (Civil and Mechanical
Barber & Young.................... 60
Chipman & Power.................. 60
Bowman & Connor................ 60
Davis & Johnston.................. 60
Farmer, John T.................... 60
Fuce, Edw. O....................... 60
Galt Engineering Co., John........ 60
Hunt & Co., Robt. W.............. 59
Inglis, John 22
Lea & Ferguson.................... 60
Mace, T. Harry.... 60
Mitchell, C. H...................... 60
McRae, John B..................... 60
Moore & Scollan.................... 60

Fire Apparatus Page
Morrison & Co., T. A............ 62
Seagrave, W. E..................... 58

Fireproof Doors and Windows
Douglas Bros......................... 49
Mussens Limited........... 32
Ormsby, A. B........................ 5

Granite and Marble
Laurentian Granite Co.............. 60
Missisquoi Marble Co..............
Rogers Supply Co..................... 31
Smith Marble & Construction Co..

Glass
Chance Brothers & Co............... 8
Consolidated Plate Glass Co.........
Luxfer Prism Co..................... 5
Thompson & Co., B. & S. H........ 8
Toronto Plate Glass Importing Co.. 1

Heating Apparatus
Jenckes Machine Co................. 2
Leonard & Sons, E......... ......
Taylor-Forbes Co.................... 63

Hoisting Machinery
Beatty & Sons, M.................. 55
Inglis, John 22
Jenckes Machine Co................ 2
Hopkins & Co., F. H............... 64
Marsh & Henthorn................ 53
Mussens Limited................... 32
Scott Machine Co.................. 5

Hydrants
Canada Iron Corporation............ 57
Gartshore-Thompson Pipe Co...... 56
Kerr Engine Co....................

Lime
Christie, Henderson & Co........... 17
Jamieson Lime Co.................. 55

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Every

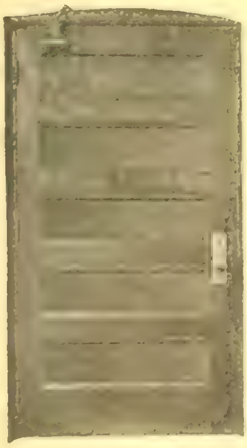
Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contracror who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited
100 King Street West, TORONTO

For Apartment Houses and Office Buildings



or any building where appearance is a consideration. Our KALAMEINED CLAD FIREPROOF DOORS have the artistic appearance and at the same time give Fire Protection. **We make them by machinery,** the wood and the iron become practically one. There is no bulging. They can be finished to any detail with trim to suit and they **mean a reduction in Insurance Rates.**

Let us give you an approximate figure.

A. B. ORMSBY, Limited

Factories
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish Page
Batts Limited 51
Brandle Lumber Co 49
Delaplante Ltd 40
Eaton & Sons, J. R. 21
Georgian Bay Shook Mills 63
Rhodes Curry & Co
Sanitary Floor Co 57
Seaman Bros 51
Standard Mills, Limited 62
Woodstock Lumber Co. 62

Metal Lath
Galt Art Metal
Metallic Roofing Co. 51
Noble C. W. 20

Meters
Hopkins & Co., F. H. 64
Neptune Meter Co. 15

Paving and Paving Materials
Dominion Carbolineum Works.
Metropolitan Paving Brick Co. 19
Ontario Asphalt Block Co. 62
Silica Barytic Stone Co., of Ontario 61

Plaster
Albert Mfg. Co 63
Britnell & Co 58

Pipe
Canadian Pipe Co. 56
Dominion Wood Pipe Co. 9
Gartshore-Thomson Pipe Co. 56
Municipal Construction Co. 17
National Iron Works 57
Pacific Coast Pipe Co. 1
Pedlar People 16

Power Engines
Inglis Co., John 22

Paints and Varnishes
Cabot, Samuel, Inc. 59
Glidden Varnish Co. 34
International Varnish Co. 56
Paterson Mfg. Co.

Pile Driving Page
Lincoln Construction Co. 58

Pumps and Pumping Machinery
Beatty & Sons, M. 55
Goulds Pump Co. 49
Hopkins & Co., F. H. 64
Inglis Co, John 22
Martin Steam Pump Co.
McDougall Caledonian Iron Works, John 31
Mussens Limited 32
Ontario Wind Engine & Pump Co. 55
Smart-Turner Machine Co. 1
Waterous Engine Works Co.

Roofing Materials
Barrett Mfg. Co.
Brantford Roofing Co 11
Galt Art Metal Co.
Metallic Roofing Co. 53
Metal Shingle & Siding Co 20
Noble, Clarence W 20
Rogers Supply Co. 31
Roofers Supply Co. 53

Railway Supplies
Gartshore, John J. 60
Hopkins & Co., F. H. 64
Mussens Limited 32

Road Machinery
American Road Machinery Co. 14
Case Threshing Machine Co. 19
Climax Road Machine Co. 56
Morrison & Co., T. A. 60
Mussens Limited 32

Sewer Pipe
American Sewer Pipe Co. 18
Britnell & Co 58
Canada Iron Corporation 19
Dominion Sewer Pipe Co. 18
Gartshore-Thomson Pipe Co. 18
Hamilton & Toronto Sewer Pipe Co. 19
National Iron Works 57
Ontario Sewer Pipe Co. 10
Rogers Supply Co. 31
Standard Drain Pipe Co. 18
Toronto Pottery Co 18

Sand
Rogers Supply Co. 31
Sand & Supplies 57

Stone Page
Britnell & Co. 54
Christie, Henderson & Co. 17
Consolidated Stone Co.
Contractors' Supply Co. 53
Corinthian Stone Co. 15
Crushed Stone, Limited 53
Doolittle & Wilcox 57
Hagersville Contracting Co. 5
Laurentian Granite Co. 69
Maloney John 55
Morrison & Co., T. A. 60
Myers, Oakley 53
Robertson, D 59
Rogers Supply Co. 31
Roman Stone Co 17
Sackville Freestone Co. 15
Sand and Supplies 59
Wiarton Stone Quarry 59

Structural Iron and Steel
Buffalo Steel Co. 55
Dominion Bridge Co. 54
Hamilton Iron & Steel Co.
MacKinnon Holmes & Co.
Pennsylvania Steel Co. 54
Phoenix Bridge & Iron Works 55
Queen City Foundry Co. 60
Reid & Brown 60

Shovels (Steam)
Beatty & Sons, M. 55
Hopkins & Co., F. H. 64
Mussens Limited 32

Shingle Stains
Cabot, Samuel, Inc. 59

Slate
Roofers Supply Co. 53

Steel Shingles and Ceilings
Galt Art Metal Co.

Safes and Vaults
Taylor, J & J 55

Sheathing Papers
Cabot, Samuel, Inc. 59

Telephone Supplies
Northern Electric & Mfg Co. 34

Tiles
Smith Marble & Construction Co.

Tanks and Stand Pipes
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 53
McDougall Caledonian Iron Works 31
Ontario Wind Engine & Pump Co. 55

Typewriters
United Typewriter Co. 62

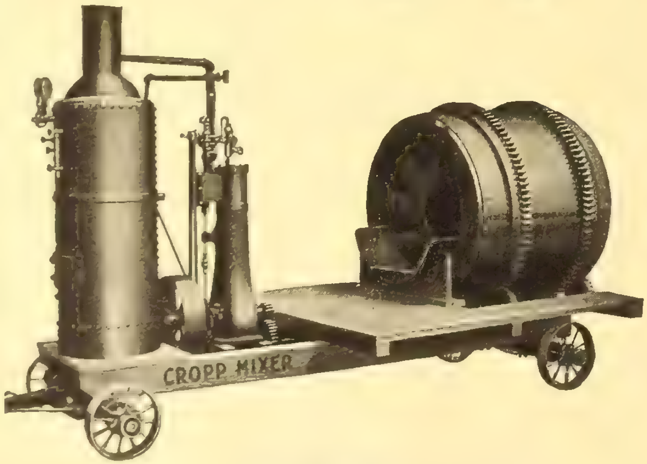
Valves
Canada Iron Corporation 57
Gartshore-Thomson Pipe Co. 56
Kerr Engine Co.
Standard Fitting & Valve Co 63

Ventilating System
Gardiner & Gaskill

Wire Rope
Dominion Wire Rope Co. 64
Greening Wire Co., B. 56
Smith, Thos. & Wm. 8

Wire Fences and Screens
Canada Wire Goods Mfg. Co. 15

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Don Valley Bricks

and Porous Terra Cotta Fireproofing

D
O
N

D
O
N

The Goods with the Reputation

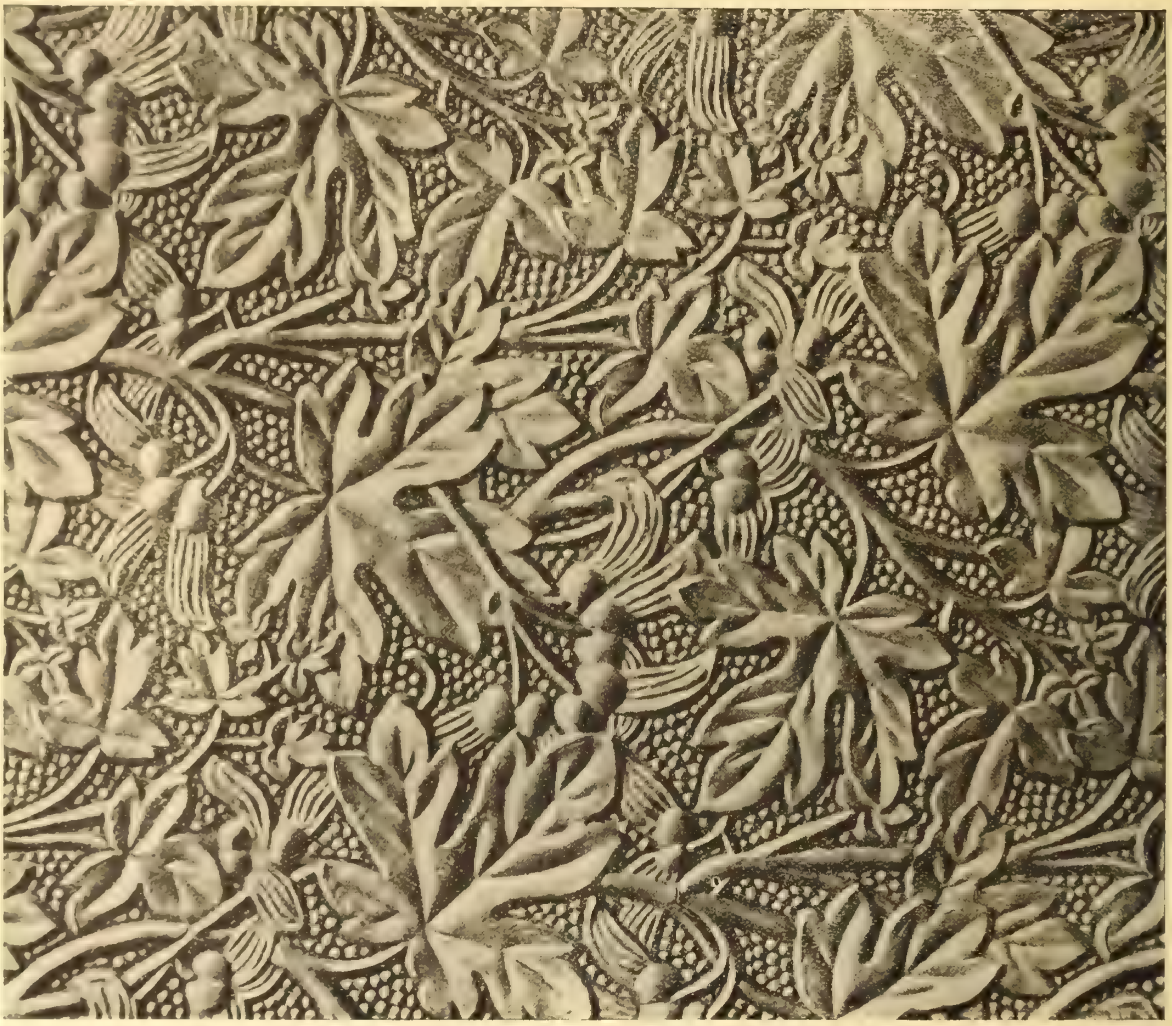
DON	Pressed Bricks
V	Enamelled Bricks
A	Vitrified Bricks
L	Wire-cut Bricks
L	Porous Terra Cotta Bricks
E	Porous Terra Cotta Fireproofing
Y	in Arches, Blocks and Furring

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: David McGill, 206 Merchants Bank Chambers

Chance's Famous Figured Rolled Glass



(Registered No. 545694)

To Architects, Builders and Contractors we will send, on request, samples of the Glass manufactured by CHANCE BROS. & CO., Limited, near Birmingham, England. Samples include Figured Rolled, Muffled and Rolled Cathedral Glass, in a variety of patterns and tints.

The "Maple Leaf" pattern, shown above, is one of our newest and most popular.

Write now for these samples. You'll probably find among them just the glass for which you have been looking.

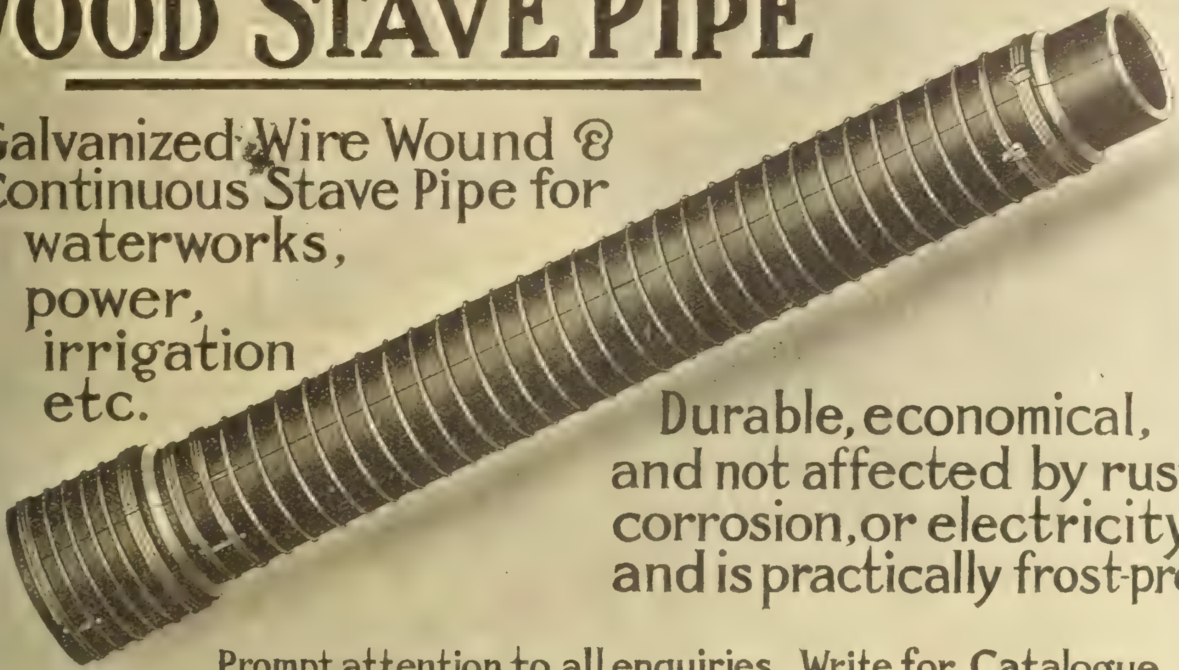
Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.



Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company, Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

When You Want Good Sewer Pipe

Don't forget that there is one place where you will be sure of the **best** article and the very best treatment.

Drop a line to

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

"MIMICO" Pipe Makes the Sewer Sure

"Brantford Specification" is now the choice of many builders and contractors

Easily and quickly laid

For stores, factories, and other buildings with flat roofs, Brantford Specification is particularly suitable. It makes a durable, lasting roof-protection at the minimum of expense.

Either Brantford ASPHALT Roofing or Brantford RUBBER Roofing is used for Brantford Specification. It is laid double, with Branroco Cement between laps. The nails are two to three inches apart and all nail heads are covered. By following our instructions for laying, the job can be easily and quickly done, and the roof made absolutely waterproof.

No coal tar is used for Brantford Specification. Coal tar gets soft and melts in summer, and becomes brittle and cracks in winter. Our saturation is 99 per cent. pure Asphalt. Asphalt of this quality and purity does not melt in summer nor crack in winter. It is the most durable saturation known.

The material for Brantford Specification retails from $5.00 to $7.50 per square, according to the thickness of the roofing. Brantford ASPHALT and Brantford RUBBER Roofing are both made in 1, 2 and 3 ply.

Further information about Brantford Specification will be promptly furnished on request.

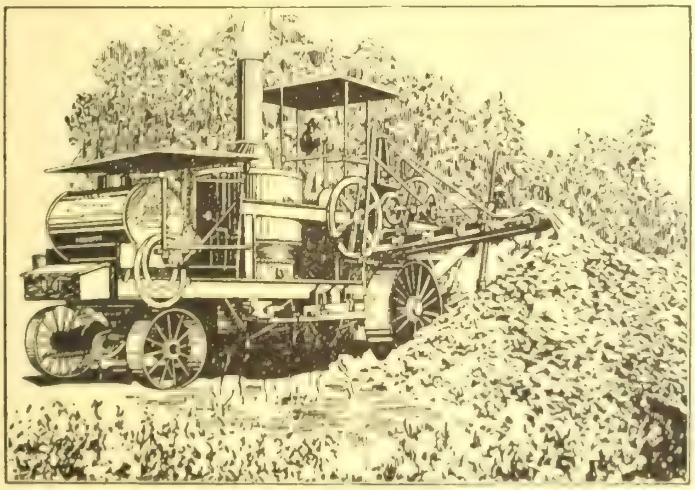
Brantford Roofing Company, Limited

Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C.
ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man.
BAINES & PECKOVER, Toronto, Ont.

Canada's Largest Reinforced Concrete Building

constructed throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS—if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and Roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

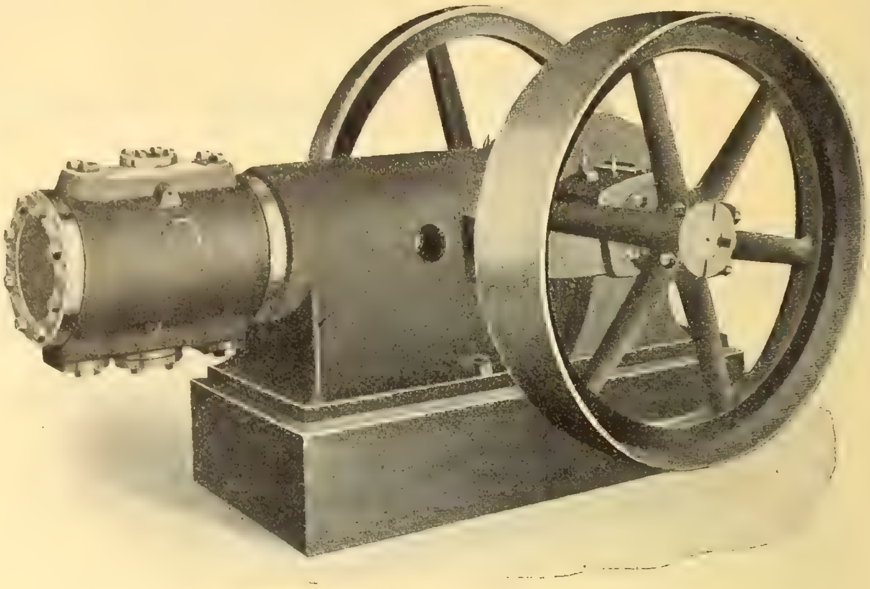
Branches: Toronto, Montreal, Winnipeg, Vancouver

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



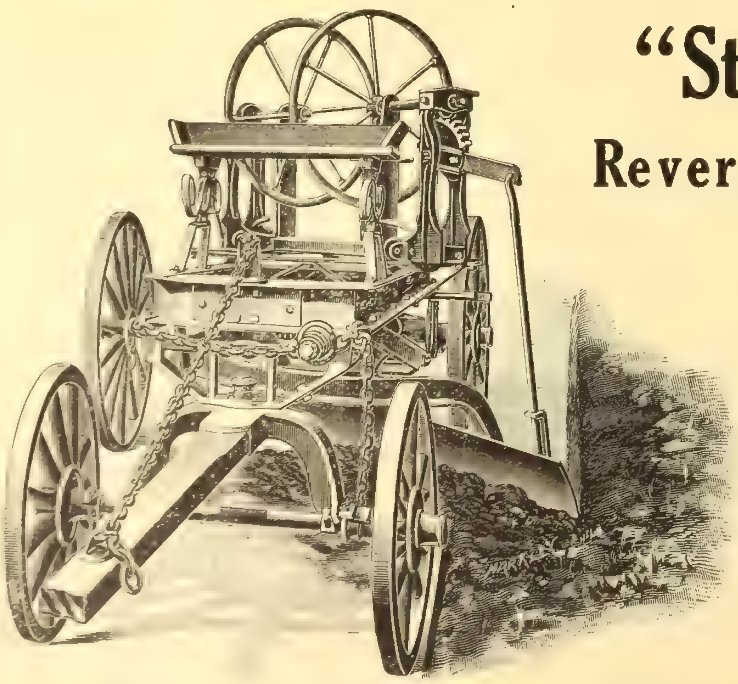
Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.

of Canada, Limited

Goderich, - - Ontario

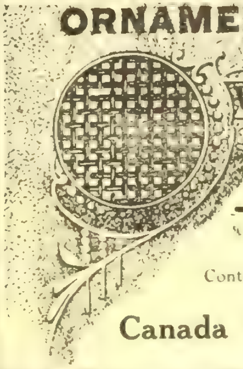
Designers and builders of road making and contractors machinery

Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

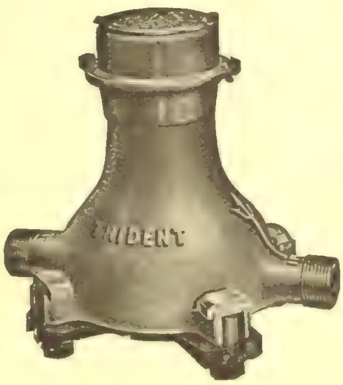
Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low Quality is High

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

"The best is cheapest"

"Sanorto"
Composition Flooring

Guaranteed durable, jointless, noiseless, fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.

CUT STONE
All kinds of Canadian and American Stone

D. ROBERTSON & CO.
Limited

Offices:
[illegible] Yonge Street, TORONTO
MILTON, Ont.

Quarries:
MILTON
CREDIT FORKS

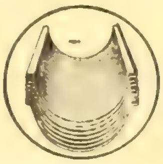
Yard:
Manning and Dupont, TORONTO

Telephones
Toronto M [illegible] C [illegible]
Milton [illegible]

Read why PEDLAR NESTABLE CULVERT

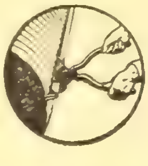
saves farmers money lowers taxes—betters roads

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:



And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

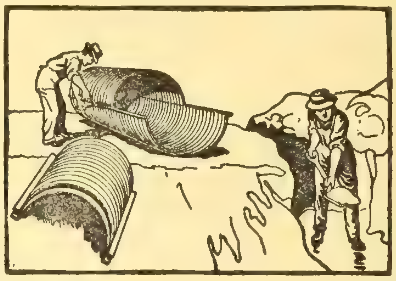
G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders—curved while cold, so the sizes never vary a fraction. These half-cylinders are then corrugated by a pressure of sixty tons to the square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.

PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no makeshifts—but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. Being made in half cylinders, they are nestable—so that a great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight and carriage costs, and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the whole story clear. State your possible needs when you write for the book, and let us quote prices.

HALIFAX
16 Prince St.

ST. JOHN, N.B.
42-46 Prince William St.

QUEBEC
127 Rue du Pont

MONTREAL
321-3 Craig St.

OTTAWA
423 Sussex St.

TORONTO
111-113 Bay St.

LONDON
86 King St.

CHATHAM
200 King St. W.

PORT ARTHUR
45 Cumberland St.

WINNIPEG
76 Lombard St.

REGINA
1901 Railway St. South

CALGARY
1112 First St. W.

VANCOUVER
821 Powell St.

VICTORIA
434 Kingston St.

ADDRESS OUR NEAREST WAREHOUSE.
WE WANT AGENTS IN SOME LOCALITIES
WRITE FOR DETAILS.
MENTION THIS PAPER.

Send Now For Free Book

BOOKLET NO. 23

And Sample Culvert

Address Nearest Warehouse of

THE PEDLAR PEOPLE

OF OSHAWA, ◦ ◦ CANADA

(Largest Sheet Metal Manufactory in the British Empire)

The Pedlar People of Oshawa
Ontario, Canada

include in the output of their immense factory the below-mentioned specialties in sheet metal building material. Samples, descriptions and prices of any of these will be readily forwarded postpaid and free upon request addressed to the Pedlar warehouse nearest to the inquirer.

Pedlar Nestable Culvert, Oshawa Steel Shingles, Steel Roofing, Corrugated Iron, Metal Shutters, Skylights, Conductor Pipes, Finials, Art Steel Ceilings, Art Steel Siding, Eave Troughs, Prepared Roofing, Metal Doors, Metal Lath, Ventilators, etc.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone
(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

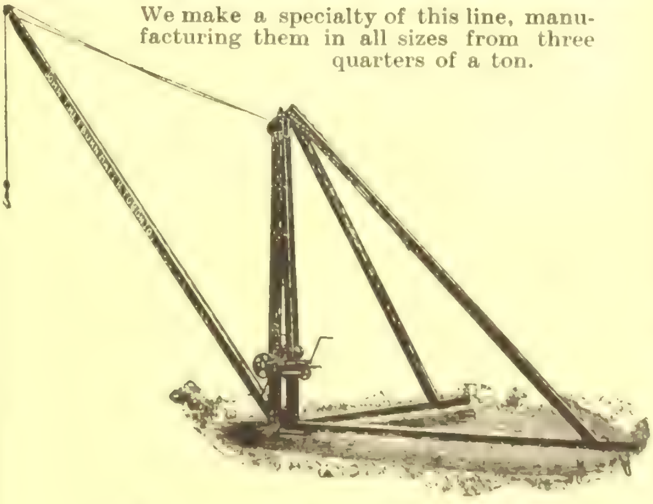
Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

Sewerage Acids do not affect the

Sizes 3 in. to 36 in.

The Standard for Quality in the United States and Canada

Fancy shapes in Chimney Tops, Fire Clay Stove Pipe and Fittings, Wall Coping, Fire Clay Flue Liners, Fire Brick and Fire Clay.

The Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

- **Chimney Tops**
- **Flue Linings**
- **Wall Coping**
- **Culvert Pipe**
- **Inverts**

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and **New Glasgow, N.S.**

American Sewer Pipe Co.

Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Glazed Earthenware

in the world.

Sewer Pipe

Single and Double Strength. Sizes 3 to 42″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

The Mint is about the only Concern that can make Money without much Effort

But if making money out of Sewer Pipe your efforts are greatly reduced if you will only specify

Hamilton Salt Glazed Sewer Pipe

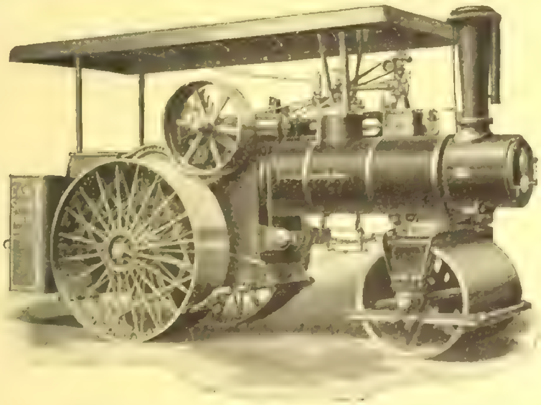
The leading pipe of its class in Canada. A half a century building up influence, and to-day the most progressive in the business. We pride ourselves on prompt delivery, good pipe too, we assure you. Write us to-day.

The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or write us

Hamilton and Toronto

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog [illegible] which gives full description. Guaranteed to do all or Anything that can be done by Any Other Make or Design of Road Roller

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba, Calgary, Alberta, Regina, Saskatchewan, Toronto, Ontario

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog [illegible]

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

Interior of "Men's Own" Winnipeg—John Atchinson, Architect.
Herringbone Lath and Perfection Studs Used Throughout.

Herringbone Metal Lath

with Perfection Studs make the best fireproof partitions known. Like all fireproof partitions they expand in a fire. Unlike all others, they buckle, but do not crush. "Some Facts" a book about it sent you on request.

CLARENCE W. NOBLE
GENERAL SALES AGENTS
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

PRESTON
STEEL
SIDING

In cases where dryness, durability, and fireproofness are desired for the most reasonable outlay it is a good policy for a contractor to

RECOMMEND

PRESTON Steel Siding. This material is moisture-proof and wind-proof. As it is made and galvanized according to British Government Specifications its durability is assured. While only costing a fraction of the price of stone or brick, PRESTON Steel Siding is equally handsome, as it is made in patterns which duplicate the appearance of stone and brick. Write us for designs and estimates on any work you may have on hand. We will reply promptly and treat you white.

Metal Shingle & Siding Co., Ltd.
Preston, Ont.
Branch Office and Factory: MONTREAL, P.Q.

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

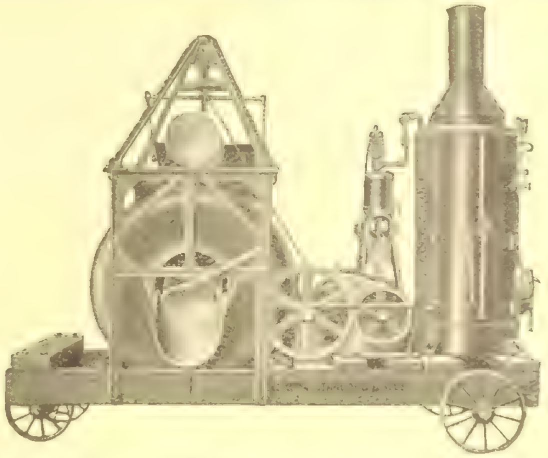
This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada



London Standard Drum Batch Concrete Mixer

Made in several sizes and with any equipment. This machine embodys the latest improvements in Batch mixers and is second to no other machine. Send for catalog stating capacity required.

We ALSO MANUFACTURE the now famous LONDON AUTOMATIC BATCH MIXERS Nos. 1 and 2, also Face-down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machine, Hand Drain Tile Machine, Sill and Lintel Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent, 52½ Princess St., Winnipeg, Man.	Geo. B. Oland & Co. 28 Bedford Row, Halifax, N. S.	A.G. Brown & Co., 1048 Westminster Ave., Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is ⅜ inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilating the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horror.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

Please Send for Samples and Prices

J. R. Eaton & Sons

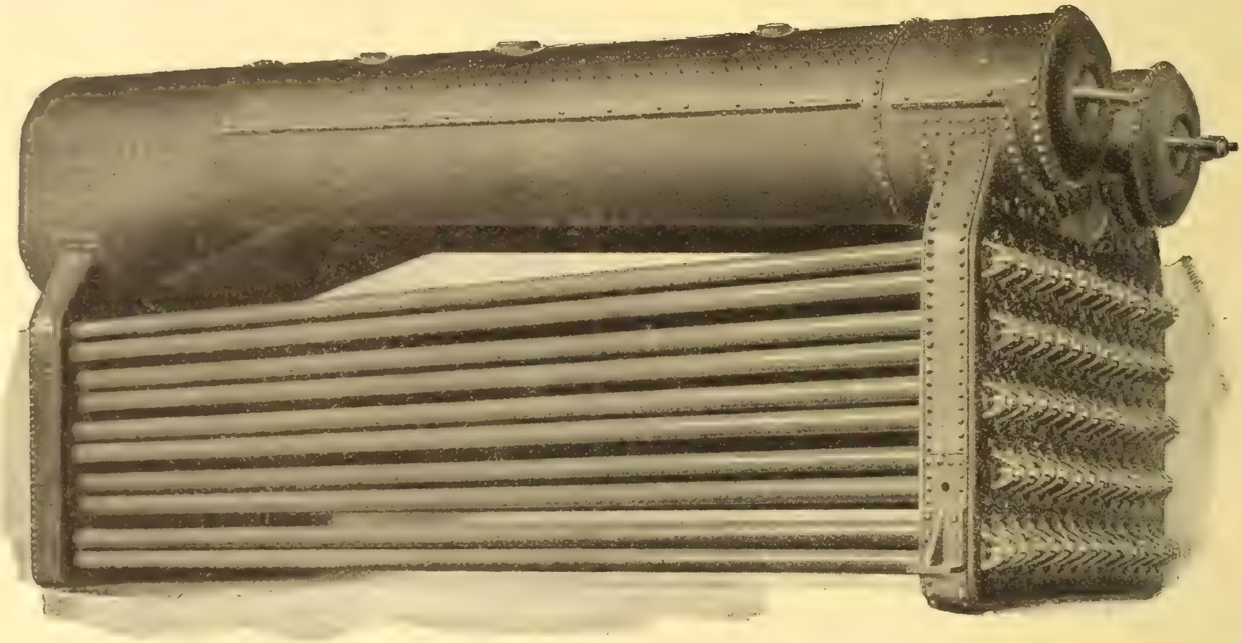
Orillia, Ontario

Montreal Agent *THE HARDWOOD* [illegible]
[illegible]

Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS **Limited**

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aylmer, Ont.

This municipality is calling for tenders until July 31st for the purchase of $21,000 waterworks extension debentures, etc. Jas. Bradley, town clerk.

Beaurepaire, Que.

Tenders for making about one mile of roadway from the main highway to G.T.R. station, are called until July 28th by C. L. Shorey, 475 St. Catherine street east, Montreal.

Collingwood, Ont.

It is probable that a by-law will be submitted for authority to spend about $5,000 on the increase of water supply. K. S. Macdonnell, town engineer.

Estevan, Sask.

Tenders addressed to L. A. Duncan, secretary-treasurer, will be received until August 24th for pipe-laying on storm sewers; power house; two return tubular boilers; high speed steam engine; electric lighting system; and sewer pipes. Plans, etc., at office of Chipman & Power, engineers, Winnipeg and Toronto, and at the town hall. For further particulars see advertisement in this issue.

Lethbridge, Alta.

The by-law for the expenditure of $148,000 on waterworks and sewers was carried. $35,000 will also be spent on streets and $12,000 on steam shovels and other equipment.

London, Ont.

Tenders for sewers on Sydenham and Miles streets and Dufferin avenue will be received until July 28th. G. W. Wright, deputy city engineer.

Moose Jaw, Sask.

The $375,000 by-law for sewer and waterworks extensions was carried: also that for $20,000 for road improvements; also that for $12,000 for concrete sidewalks; also that for $20,000 for permanent improvement of roads.

Medicine Hat, Alta.

A by-law to expend $45,000 on waterworks extension will be submitted to the ratepayers on August 15th.

New Westminster, B.C.

The ratepayers have passed a by-law to issue $150,000 street improvement debentures.

Outremont, Que.

The following list of tenders for sewers has been sent in: R. T. Smith & Company, Montreal, $1,928.50; W. G. McDonald, $2,434.00; W. Duquette, Montreal, $1,169.01; M. Lapointe, Montreal, $1,183.

Outlook, Sask.

The ratepayers carried the $25,000 waterworks by-law.

Orillia, Ont.

Tenders addressed to A. E. Cavana, O. L. S., engineer for Township of Medonte, will be received until July 29th for the construction of drain No. 7. Plans, etc., with T. D. Robinson, clerk, or at the office of the engineer.

Prince Albert, Sask.

City Engineer Creighton has submitted plans for a trunk sewer to cost $94,994. Construction will start as soon as the Provincial Health Department approves.

Peterboro, Ont.

Chipman & Power, consulting engineers of Toronto, are preparing plans for sewerage in the south end. Tenders to include sewer construction, pumping station, machinery, etc., will probably be called in a few weeks' time. T. S. Hay, city engineer.

Penetanguishene, Ont.

On August 2nd by-laws will be voted on to issue the following debentures: $2,075, 20 years, for cement walks; $2,078, 20 years for sewer construction; $24,220, 30 years for payment of floating debt; $3,280, 20 years for sewers, culverts and water meters. The above debentures all bear 5 per cent. interest. W. H. Hewson, town clerk.

Sydney, N.S.

The pelbiscites on water extension and subway received favorable verdicts.

St. John, N.B.

The tenders for the permanent pavement in Germain street were considered, and it was resolved to call for new tenders. Under the new call the tenderers will be asked to submit samples of the asphalt they propose to lay, for analysis, on which the engineer will report.

Steelton, Ont.

The plan submitted to the Provincial Board of Health for sewerage disposal was not approved.

St. Thomas, Ont.

Tenders will be received until July 27th for the clear water concrete reservoir at the waterworks. Jas. A. Bell, city engineer.

Swift Current, Sask.

By-laws for sewerage, sewage disposal and water supply were carried. J. Darlington Whitmore, of Regina, engineer.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until August 2nd for supply of water meters for the year. Specifications at office of city engineer.

The one tender for the 500-foot extension, etc., quoted $35,000. Engineer Fellowes' estimate, $20,000. Referred to the engineer for report.

The Provincial Board of Health has approved plans for sewerage disposal at Alma, Oshawa, Tillsonburg and Trenton.

Tenders will be received until August 2nd for supply of floor tile for the filtration plant. G. R. Geary, Chairman, Board of Control.

Victoria, B.C.

The C. P. R. has decided to lay Hassam pavement on the roadway through the Empress hotel grounds. The estimated cost of the work is $4,000.

Verdun, Que.

The town council have decided to replace the old board sidewalks with concrete. Work has already been started on the Lower Lachine road. Five miles of sidewalk will be laid before the autumn.

Winnipeg, Man.

Pavements, walks and sewers, totalling $224,506, were passed by council at last meeting and will be advertised for tenders.

AWARDED.

Brampton, Ont.

The contract for construction of 7,200 square yards of macadam roadway was given to John Conn, Windsor, at 88 cents per yard; that for grading to same at 39 cents per square yard.

Chatham, Ont.

The County Council have awarded the contract for paving the south approach of Kent bridge to the Fielder Paving Company.

Foam Lake, Sask.

C. H. Conery and C. Mattaini, of Guelph, Ont., were awarded a contract for construction of 13,000 square feet of concrete sidewalk, at 16 cents a square foot for walks, and 63 cents a lineal foot for curb.

Hamilton, Ont.

J. J. Armstrong was given the contract for sewers in the following streets: Barton, Bay to Park, at 47 cents a foot; Simcoe street, James to Hughson streets, 44 cents a foot, and Fife street, 60 cents a foot.

New Westminster, B.C.

The contract for the laying of the new Coquitlam pipe line has been let to the Municipal Construction Company for $108,557.57.

Ottawa, Ont.

The Ottawa Construction Company has been awarded the contract for surfacing in asphaltic mixture the drives leading to and from the House of Commons at 65 cents per yard.

Prince Rupert, B.C.

The Westholme Lumber Company got the contract for a million feet of lumber for sidewalks at $15,000.

Victoria, B.C.

The contract for the supply of [illegible] yards of sand for the filter beds at Elk lake will be awarded by the city to Messrs. [illegible] per yard. Four hundred enamel street names will be purchased from the Thomas Davidson Manufacturing Company, Montreal, at a cost of 37½ cents each. Tenders for these signs were called for some time ago, but only one bid was received of eighty five cents each.

Railroads, Bridges and Wharves

Dover, N.S.

Tenders for wharf here have been called until August 15th by the Public Works Department. Plans at offices of district engineers at Halifax and Antigonish. R. C. Desrochers, assistant secretary.

Elmira, Ont.

On the 1st of August a by-law will be submitted to the ratepayers to authorize the expenditure of $25,000 for cement arch bridge on Arthur street.

Kenora, Ont.

Plans for the new subway under the C. P. R. track on Main street were received from Geo. A. Montain, chief engineer of the railway commission. It is understood the C. P. R. have already approved of the plans, and construction will be commenced within the next month.

New Westminster, B.C.

The ratepayers have passed a $30,000 bridge by-law.

North Vancouver, B.C.

By-laws will be submitted to the ratepayers asking for authority to issue $100,000 debentures for the purpose of subscribing for stock in the Second Narrows Bridge Company.

Ottawa, Ont.

The C. P. R. accepted options on property aggregating $125,000 adjacent to their present freight yards on Sussex street. The company proposes to considerably increase their present train yard.

Port Arthur, Ont.

It is stated that tenders for extension of breakwater will be called shortly.

Port Felix, N.S.

Tenders are being called until August 15th by the Public Works Department for construction of wharf, etc., here. R. C. Desrochers, assistant secretary.

Richibucto Cape, N.B.

Tenders for extension to breakwater will Ottawa, until August 17th. Plans, etc., be received at Public Works Department, at offices of E. T. P. Shewen, district engineer, St. John; G. Stead, district engineer, Chatham, and on application to local postmaster.

Regina, Sask.

The C. N. R. has applied for permission for joint terminals with G. T. P. for the passenger traffic.

Sault Ste. Marie, Ont.

Tenders will be received until July 30th for the supply of 250,000 standard railway ties for the Algoma Central Railway, etc. For information apply General Superintendent, Sault Ste. Marie.

Toronto, Ont.

A conference was held on the 21st inst. between promoters of a terminal railway station in this city, and the Board of Control and representatives of the Board of Trade. The promoters comprise the following New York men: F. M. Andrews, architect; G. V. Hedden, contractor; A. P. Gillies, and F. E. Townsend. A scheme will be submitted later which, it is stated, will obviate the necessity of viaducts, etc. Messrs. Townsend and Eakins will open an office here.

Tenders are being called by the Board of Control for construction of reinforced concrete viaduct on Weston road, until August 9th. For particulars see advertisement in "Tenders and For Sale Department," this issue.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until September 6th for construction of steel viaduct on Queen street over the Don river, etc. Plans, etc., at office of Bridge Department, City Hall. For further information, see advertisement in "Tenders and For Sale Department" of this issue.

The Board of Control authorized the city engineer to advertize for tenders for ties and rail for the proposed civic industrial railway to be laid on the east side of the Don.

Winnipeg, Man.

It is found that the contract price of the Brant and Brown street overhead bridge exceeds the amount voted for the purpose by several thousand dollars and the work may be held up until a supplementary by-law for the additional amount

AWARDED.

Cornwall, Ont.

The following list of tenders for concrete arch bridge over River de Lisle, 1½ miles north of Alexandria, has been sent in:—Morpaw & McDonald, St. Andrews West, $2,066.25 (accepted); McDonald & McDonald, Alexandria, $2,393.07; Chisholm & Quinn, St. Andrews West, $2,511.45; G. R. Phillips, Cornwall, $2,477.25; Helmer & Winstanley, Russell, $2,527.31; D. G. McMillan, Finch, $2,535; A. Cameron, Alexandria, $2,196. W. H. Magwood, county engineer. Dimensions of bridge, 32-foot span and 18-foot roadway.

Orangeville, Ont.

The Hunter Bridge & Boiler Works, Kincardine, were awarded the contract for steel truss highway bridge in Township of Chinquacousy. C. R. Wheelock, engineer Peel County.

Public Buildings, Churches, Schools, etc.

Aylmer, Que.

Tenders are being called for a 2-room addition to the Academy at Aylmer, Que. The addition will be of stone, costing about $5,000. M. C. Edey, architect, Ottawa.

Bellville, Ont.

A by-law is soon to be voted on to issue $30,000 school debentures.

Brantford, Ont.

A building permit has been issued for the erection of the new St. Basil's school. Cost, $19,900.

Chatham, Ont.

Wilson & Son, architects, are preparing plans for a ventilation system for the House of Refuge.

Chilliwack, B.C.

A site has been purchased from Mr. S. A. Cawley, M.P.P., upon which the new city hall will be at once erected.

Tenders were received until July 23rd for the erection of hospital. Plans, etc., at office of the Snelgrove-Waddington Company.

Darlington, Man.

A new public school to cost $8,000 will be erected here shortly.

Edmonton, Alta.

Tenders will be received until August 6th for $115,000 5 per cent. 30-year, and $30,000 5 per cent. 10-year school debentures.

Fort Wililam, Ont.

The site for the court house and police station has not yet been selected.

Fredericton, N.B.

A committee formed of Rev. J. H. MacDonald, Rev. Dean Schofield, Rev. Father Carney, Messrs. E. Moore and D. Fraser have been appointed to look into the matter of the enlargement of hospital here.

Grand Forks, B.C.

Government Architect Henderson has plans for the new post office. The new building will be a two-storey brick structure and will cost $40,000.

Halifax, N.S.

Tenders addressed to R. C. Desrochers, assistant secretary, Department of Public Works, Ottawa, will be received until August 3rd for fittings for savings bank. Plans, etc., on application to Mr. D. A. Hewitt, architect, custom house, this city, and at the above department.

Kingston, Ont.

The Board of Education decided to have plans and estimates prepared for one or more school buildings, and later to ask council for necessary funds for same.

Tenders were called until July 22nd for erection of synagogue. Power & Son, architects.

Mitchell, Ont.

Plans for the reconstruction of the town hall here are being prepared by Architect T. J. Hepburn, of Stratford.

Montreal, Que.

Plans have been prepared and tenders will be received until August 4th for the construction of Maisonneuve Town Hall. Mr. C. Dufort, architect.

It has been decided to have more extensive plans prepared for the new Montreal Art Gallery. Estimated cost now $300,000. D'Archambault stone will be specified, and the building will be two storeys in height. Associate architects, Mr. Edmund Wheelwright and Messrs E. & W. S. Maxwell.

Plans and specifications have been prepared and tenders will be received until August 2nd for the erection of the Academy Garneau, on Visitation street. Marchand & Haskell, architects.

Building permit was issued to Chalmers Presbyterian Church, St. Lawrence Boulevard, $90,000. Reid, McGregor & Reid, contractors.

Niagara Falls, Ont.

On August 1st by-laws will be voted on to issue $2,500, 20-year, 5 per cent. Fire Hall debentures; $15,000 30-year 5 per cent. Collegiate Institute.

New Westminster, B.C.

A $12,000 church is to be built on Sixth avenue, between Eleventh and Twelfth streets, by the Sixth Avenue Methodists.

The $60,000 school bylaw was defeated. It will likely be submitted again shortly in a different form.

Oriole, Ont.

J. R. Whittaker is receiving tenders until July 31st for erection of school, section 11, East York.

Orillia, Ont.

Tenders addressed to J. R. Robertson, architect, will be received until July 30th for the erection of Sunday school building for the Baptist church. Plans, etc., at office of the above.

Ottawa, Ont.

A party of architects from New York have been taking measurements of Bank

Street Presbyterian Church to ascertain its adaptability for a theatre. This church is for sale, the congregation having secured a site for a new building.

Tenders addressed to R. C. Desrochers, assitant secretary, Department of Public Works, will be received until August 3rd for post office fittings, this city. Plans, etc., at above department.

Prince Albert, Sask.
Plans have been prepared by Architect Albretchsen for the theatre here. Noted in issue of July 13th.

Peterboro, Ont.
Hon. Senator Cox has offered the authorities of the Charlotte Street Methodist Church $10,000 towards the erection of a new church on the present site, or a site at the head of Simcoe street, or $25,000 and a site for the erection of a new church on Belmont avenue.

Quebec, Que.
Tenders are called until the 28th inst. for construction of fire hall at Limoilu. W. D. Baillairge, city engineer.

Tenders addressed to R. P. LeMay ,architect, Quebec, will be received until August 4th for supply and installation of the following apparatus for the Technical School here: complete forced hot water system, etc.; plumbing system; clock and telephone system; wiring and lighting fixtures; motor generator set; 55 k.w. vertical engine and 25 k.w. horizontal engine; d.c. electric generators; storage battery and booster; electric motor equipment; switchboard installation. Plans, etc., at office of above mentioned or at office of Canadian Domestic Engineering Company, consulting engineers for the Commission, 5 Beaver Hall Square, Montreal. The tenders are requested from contractors in Quebec province. A. Galipeault, secretary, Commission Ecole Technique de Quebec.

Regina, Sask.
The library board will call for plans for fireproof building to cost not more than $40,000, and be in the hands of the board by September 1st, 1910. The site has been acquired at the corner of Twelfth avenue and Lorne street.

Saskatoon, Sask.
Tenders were called until July 27th for erection of college barns and three houses for the University of Saskatchewan. Plans, etc., at office of University, or at office of architects, Brown & Vallance, Montreal.

St. Thomas, Ont.
The Roman Catholics of this city, it is stated, will either erect a new church or remodel the present one next year.

Stratford, Ont.
A by-law will be submitted to the ratepayers shortly to authorize the expenditure of $5,000.

Smith's Falls, Ont.
The tenders received for the new hospital were too high. Plans are being revised and new tenders will be called.

The award of the arbitration on the site for the school has not been accepted by the school board.

Toronto, Ont.
The following permits were issued recently: Sisters of St Joseph's Community House, Power street, [illegible]; Board of Education, alterations to the public school corner Richmond and York streets, [illegible]; Reformed Presbyterian Church's new edifice, Bloor street east, [illegible], and St. Barnabas Church's new building at the corner of Danforth and Hampton avenue, $12,000.

It is stated that 592 Sherbourne street, owned by H. Gooderham has been purchased as a site for Branksome Hall (Girls' School). Miss M. T. Scott is principal.

Tenders addressed to H. F. McNaughten, secretary Public Works Department, will be received until July 28th for construction of conservatory and green-houses at Normal School here. Plans, etc., at above department.

The congregation of Riverdale Presbyterian Church have decided to purchase 40 additional feet on Pape avenue, thus giving the new church a frontage of 160 feet. Rev. J. A. Miller, pastor.

A permit has been issued for the erection of a two-storey Sunday school building in connection with the Bathurst Street Methodist Church, corner Bathurst and Lennox street, $30,000.

Plans for the new Masonic Temple on College street, south of Markham, have been prepared. When approved by city architect, tenders will be called.

Tenders were called until July 25th for masonry work in connection with the enlargement of Earlscourt School. Plans, etc., at office of the Board, City Hall.

Victoria, B.C.
Tenders were called until the 20th for erection of a 4-storey club building on Rae street for the Alexandria Club. D. C. Frame, architect. Noted previously.

Vancouver, B.C.
The Cedar Cottage Orangemen will build a hall on the Flett road. The directors consist of the following: President, Rev. J. C. Madill; secretary, W. T. Broderick, etc. As soon as plans are finished, construction will begin.

Windsor, Ont.
Essex County Council have decided to accept the offer of A. L. Irion to erect a modern office building at the corner of Ouellette avenue and London street, to be used for county offices. Ald. Banwell is interested.

Winnipeg, Man.
The new Children's Hospital, for which $25,000 has been collected, will be modelled after the Hospital for Sick Children in Toronto. Noted previously.

Tenders are being called until August 1st for the construction of a new home for the Westminster church congregation. J. H. G. Russell, architect.

AWARDED.

Edmonton, Alta.
The contract for erection of school for Order of Oblates of Mary Immaculate has been awarded to McSporran Company. Barnes & Gibbs prepared the plans.

Montreal, Que.
The contract for rebuilding the Catholic church at Cote St. Paul, destroyed by fire in 1907, has been awarded to Contractor Martineau. Estimated cost, $40,000.

Moose Jaw, Sask.
We are informed that the contract for erection of Isolation Hospital has been awarded to Ellis Bros., at $11,350. Higgins & Moir got the contract for heating and plumbing at $2,600. W. Zimmerman, architect, also that Willoughby & Hay were awarded contract for sub-fire station at [illegible]. All three local contractors. Architect for fire-station, J. M. Wilson.

Ottawa, Ont.
Eastwood Public School Board has awarded contracts for a new four-roomed school. The aggregate of the tenders awarded was $10,545. C. J. Burritt is architect. W. G. Adamson gets the contract for masonry, bricklaying, etc., and carpentering, for $6,785. Others receiving contracts were Frank Hunt, plastering; J. R. McLennan, plumbing and heating; Modern Machine Company, galvanized iron work; George Higman & Sons, painting and glazing; T. E. Hobson, electric wiring.

Strathcona, Alta.
The contract for the new school has been awarded to Wm. Deitz, the lowest, at $12,900. The tenders ran as high as $17,000. Wilson & Herrald, architects.

Saskatoon, Sask.
Blum & Delbridge, of Cleveland, O., it is reported, have secured the contract for the cut stone required in the five buildings at the University of Saskatchewan at $87,000.

St. Catharines, Ont.
Mr. S. P. Gourlay has secured the contract for the plumbing at the Nurses' Home, and Mr. John Peart has obtained the contract on the new addition to the hospital.

Taber, Alta.
The following tenders were received for the erection of new school: E. R. Wildman, $52,975 (accepted); Hotson & Leader, Lethbridge, $59,980; J. E. Lusier Construction Company, Lethbridge, $55,000; R. A. VanOrman, B. A. Stringum, Taber, $52,975.

Toronto, Ont.
W. J .Maguire & Company will instal the steam heating plant in the Allan Gardens palm house at $3,970.

Waterford, N.S.
The following tenders for jail were received: Rhodes, Curry & Company, Sydney, $2,475; F. L. Dixon, Sydney, $2,034.90; J. R. Martin, Sydney, $1,825; Daniel Gillis, Waterford, $1,650; Angus McEachren, Lingan, $1,549 (accepted).

Residences

Fort William, Ont
Tenders are called until July 27th by Hood & Scott, architects, for erection of two residences.

Mansonville, Que.
The following residences were destroyed by fire recently: Mayor Perkin's brick residence, $5,000; Mrs. Burhardt's residence, $5,000.

Montreal, Que.
Plans and specifications have been prepared and tenders will be received up to August 2nd for the erection of residence on Elm avenue, Westmount, for Mr. F. Berlind. Mr. C. Dufort, architect.

Plans are being prepared for the erection of a residence on Western avenue, Westmount, for Mr. J. P. Vanier. C. Dufort, architect.

A residence is being erected at Ile Cadieux, Que., for Mr. R. P. Cowen, by Jas. Williams, contractor. Plans prepared by Mr. T B. Daniel, architect, Beaver Hall Square.

The [illegible] Realty Company, [illegible] street, [illegible] department, are erecting an apartment house on Bishop street to cost $10,000.

Ottawa, Ont.
C. J. Burritt, architect, is preparing plans for a residence for [illegible] on [illegible] street.

[illegible] is preparing to erect a country home near the golf links. W. E.

Noffke, architect, is calling for tenders. Estimated cost, $10,000.

W. E. Noffke, architect, is calling for tenders for a residence on the Driveway west of Bank street. Estimated cost, $13,000.

Toronto, Ont.

Mr. [illegible] has been granted a permit to erect a two-storey addition to his residence on Clarendon avenue. Cost, $25,000.

Victoria, B.C.

A contract will shortly be let for the construction of a two-storey residence for W. S. Drewry, Chief Water Commissioner. Cost, about $6,000. P. Leonard James, A. R. A. I. C., is the architect.

Building permits for residences were issued to J. C. Pendray, Belleville street, $5,500; to Alexander Peden, Richardson street, $4,500.

Vancouver, B.C.

Messrs. Thornton & Jones, architects, have prepared plans for a 4-storey apartment house on Hastings street for Mr. C. Tweedale; also of a two-store and apartment blocks on Broadway for Mr. C. R. Gilbert; also for apartment house on Westminster east.

AWARDED.

Montreal, Que.

Contracts have been awarded as follows in connection with the erection of two residences on Cedar avenue for Mr. G. A. Campbell: Masonry and brickwork, Messrs. Ward & Balldock; carpentering, W. Eveley; roofing, Sibley & Muot; steel work, Dominion Bridge Company; plastering, D. A. Bethune; hardware, Jas. Walker & Company; plastering, Clarke & Sons; painting, R. E. Jones. Messrs. McVicar & Heriot, architects.

Mrs. H. S. Phillips is erecting an apartment house on Dorchester street west, to cost $22,000. Contract for the erection of same has been awarded to Alex. Brosseau, contractor, 561 Maisonneuve street. Architect, Theo. Daoust, 90 St. James street.

The contract for the erection of two houses for Mr. S. H. Ewing, 100 Cote des neiges road, has been awarded to Francis Villeneuve, contractor, 1785 St. Lawrence Boulevard. Mr. Graham White, architect.

Oshawa, Ont.

Contract for brickwork of a new residence for Geo. MacLaughlin, Esq., Simcoe street, was awarded to Robt. Bennett, Euclid avenue, Toronto.

Ottawa, Ont.

James Mather has been chosen architect for an apartment house and stores to be erected on the corner of, Dalhousie and Murray streets; M. Drazin, owner. The general contract has been awarded to John Robertson & Son. The building will cost over $18,000.

Jas. McLaughlin has been awarded the plastering contract for the apartment house which Patrick LaBelle is erecting corner Metcalfe and Gilmour streets, $4,000.

Business Buildings and Industrial Plants

Brandon, Man.

Pratt & Ross, architects, Winnipeg, for the C. N. R., will receive tenders until July 30th for construction of hotel and depot.

Blairmore, B.C.

The large mill and lumber yard, the property of Peter McLaren, located near here, were destroyed by fire recently with a loss of $50,000.

Brandon, Man.

The fifth and sixth storeys of the Empire Hotel were damaged by fire to the extent of about $24,000 on the 24th inst.

Brantford, Ont.

The Brantford Brewery, owned by Westbrook & Hacker, was completely destroyed by fire on the 23rd inst. Loss about $50,000. Proprietors will rebuild.

Calgary, Alta.

The C. N. R. announces that it will build in Calgary a combined depot and hotel, on the corner of Tenth avenue and Tenth street, to be designed after the Royal Alexandra in Winnipeg.

Chatham, Ont.

It is stated that the International Harvester Company, of Chicago, has secured the control of the Chatham Wagon Company, of this city, and that they will eventually extend the plant. Present Board of Directors of latter company include President, Manson Campbell; vice-president, H. Malcolmson, etc. Plans also include a $75,000 addition to International Harvester Company in London.

Highgate, Ont.

The Dobson block was destroyed by fire on the 21st inst. Estimated total loss, $17,000.

Hamilton, Ont.

Lindsay A. Wardell, brick addition to hotel building, Mulberry and James streets, for Mrs. G. Case, $4,500.

London, Ont.

The Bell Telephone Company have secured a lot next to the local exchange. No additions will be made this year.

Mansonville, Que.

The properties destroyed by fire in the recent fire are as follows: Commercial House, loss about $6,000; George Holmes' store, loss about $6,000.

Montreal, Que.

Tenders will be received up to July 28 for the erection of a four-storey business building on St. Lawrence Boulevard, for the City House Furnishing Company. Mr. C. Dufort, architect.

Plans and specifications have been prepared and tenders are now being received for the erection of a factory building at Cote St. Paul for the Marx-Rawolle Company, of Canada, Limited. Messrs. Saxe & Archibald, architects.

Tenders were received up to Wednesday July 27th for the erection of a five-storey reinforced concrete, cold storage building on Dorchester street for Mr. Gatehouse. Mr. A. Piche, architect.

The Carsley property on St. James street wil lbe converted into a hotel and restaurant. The group of men who acquired the building have sub-let the property to Freemans, Limited, who are planning to spend $350,000, it is said, in fitting up a first-class restaurant and hotel, remodelling the entire building to suit their requirements. The present building will be remodelled and there will be constructed in the centre of the building a rotunda, which will lead into the restaurant and the connecting stores. The Carsley property now taken over consists of about 12,800 square feet of land and the five-storey building thereon. In addition, the company have leased the adjoining premises on Notre Dame street from the Caverhill estate. This has an area of about 18,000 square feet.

Owen Sound, Ont.

In the fire here on the 22nd inst. some of the losses are reported as follows: Davis, Smith & Malone, $22,000; MacLaughlin, Son & Company, $7,000; Godfrey & Sibbald, $7,000; Dominion Transportation, Northern Navigation Company and George Herbain, together, $5,000.

Ottawa, Ont.

J. Freedman is having plans prepared for four stores on Rideau street. W. E. Noffke, architect.

M. C. Edey, architect, is calling for tenders for shop and dwelling at corner of Bronson avenue and James street. Cost, about $8,000.

Prince Rupert, B.C.

The Prince Rupert Wholesale & Liquor Supply Company propose erecting suitable premises for their business here.

Preston, Ont.

The Ballantine by-law which was to have been voted upon on August 1st has been withdrawn at the request of the company.

Peterborough, Ont.

Tenders are called until July 30th for erection of brick foundry. W. Blackwell, architect.

Port Arthur, Ont.

The Riley-Ramsey Company, Lincoln street, will erect a four-storey and basement warehouse on Water and Cameron streets. Work will not commence until the spring. W. P. Riley, president.

Prince Rupert, B.C.

J. Hamblin's bakery and Peterson & Olsen's hotel were restroyed by fire on the 19th inst.

Regina, Sask.

Tenders were called until July 25th for erection of warehouse for National Drug & Chemical Company. Storey & Van Egmond, architects.

Ruskin, B.C.

The E. H. Heap Company's lumber mill here was burned last night. The loss is estimated at $50,000.

St. Stephen, N.B.

The Maritime Edge Tool Company purpose enlarging their buildings, in consideration of which exemption is asked.

Seaforth, Ont.

On August 8th the ratepayers will vote on a bylaw to guarantee the Bell Engine & Threshing Company to the amount of $50,000 in return for which the company will enlarge their plant.

St. Andrews, N.B.

It is announced that the C. P. R. will add another large concrete wing to the Algonquin Hotel here this fall.

Sydney, N.S.

The plebiscite taken here on the 20th re bonus for shipbuilding plant mentioned in issue of July 13th was favorable to the grant.

Saskatoon, Sask.

The Hill Manufacturing Company (sash and door factory) state that they will not rebuild at once their plant recently destroyed by fire.

Tupperville, Ont.

The grain elevators of R. F. Stover were destroyed by fire on the 19th inst. Loss is estimated at about $20,000.

Three Rivers, Que.

The foundry and machine shop of Bellefueille & Frere were destroyed by fire on the 21st inst. The loss will be about $10,000.

Torrance, Ont.

The hotel here on Lake Muskoka was destroyed by fire recently. Loss, about $10,000.

Toronto, Ont.

The following permits were issued recently: Wm. Neilson's Company's factory, Gladstone avenue, $35,000; Otto Higel's addition to factory, King and Bathurst, $15,000.

The storage sheds and eastern dock of the Niagara Navigation Company are reported damaged by fire on the 24th inst. Estimated loss, about $20,000.

Tenders addressed to Darling & Pearson, architects, will be received until July 30th for trades required in the erection of branch building for Imperial Bank on the corner of Queen and Roncesvalles.

Victoria, B.C.

Damage to the extent of about $3,000 was done to the B. C. Fur Manufacturing Company, Government street, on the 11th inst.

A building permit was issued to George Carter for a two-storey brick building on the south side of Courtney street between Douglas and Blanchard streets, to cost $4,500.

Vancouver, B.C.

The stock exchange have secured a central site for a new building.

The Maple Leaf Milling Company will establish warehouses here. Hedley Shaw, president, is at present at the Coast.

The British Columbia Piano Company, Limited, will locate a factory, it is stated, at 1670 Cordova street. President, J. Auld; secretary, F. H. Lewis.

Building permit was issued to the Vancouver Trust Company for a bank block on Pender street between Granvilel and Seymour. Estimated cost, about $50,000.

A building permit was granted to Mr. F. Morgan covering a brick business block at 242 Hastings street east. The building will be three storeys in height and cost $25,000.

Mr. O. Kahlert, Chicago, Ill., has been in communication with the civic market and industries committee here in regard to the establishment of a wire window screen factory. He purposes making a tour of Canadian cities after July 25th with a view to selecting Canadian headquarters.

Tenders were taken until July 18th for excavation for the World Building, corner of Pender and Beatty streets. W. T. Whiteway, architect.

Messrs. Thornton & Jones, architects, have plans for a large warehouse to cost about $100,000.

Welland, Ont.

Contract for the Peter [illegible] will be let shortly. H. S. Peter, Dover, N.J.

Winnipeg, Man.

Tenders will be received up to August 1st for the construction of a [illegible] warehouse for D. E. [illegible] street. J. H. G. Russell, architect.

Tenders will be received by J. H. [illegible] Russell until August 1st for the construction of a four-storey factory for Stobart and Sons, corner of Lydia street and McDermot avenue. The factory is to be of mill construction.

E. L. Drewry is having plans perfected for the construction of a 54-horse stable in connection with his big manufacturing plant, the Redwood Breweries.

J. D. McArthur has secured a permit for a warehouse on the south side of McDermot avenue.

The Manitoba Elevator Commission, 279 Garry street, will receive tenders for supply of gasoline and drums to be despatched to points within the province of Manitoba for operation of grain elevators.

Yorkton, Sask.

Bulk tenders were called until July 23rd for erection of bank building for the Bank of Toronto. J. D. Atchison, architect, Bank of Toronto Building, Winnipeg.

AWARDED.

Montreal, Que.

The Foundation Company, Limited, Montreal, has been awarded the contract for the construction of several oil tanks for the Queen City Oil Company. The structures will be about 110 by 50 feet.

The general contract for alterations to Kastell's restaurant has been awarded to D. M. Long. Messrs. Finley & Spence, architects.

The general contract for the erection of a factory building for the Berliner Gramaphone Company, St. Antoine and Le Noir streets, has been awarded to D. L. Loomes & Company, general contractors. Messrs. McVicar & Heriot, architects.

Contracts for erection of milling plant for the St. Lawrence Flour Mills Company, Canal bank, have been awarded to the Barnett-McQueen Company, Limited, Winnipeg and Minneapolis. The mill is to be built of reinforced concrete. It will be fireproof throughout. The grain elevator will also be of reinforced concrete, with marine elevators and all modern handling machinery. The contract for the mill machinery has been secured by the Allis-Chalmers Company.

General contract for the alterations to property at 132 Mansfield street, for Madame Marie, has been awarded to Sparrow & McNeil, general contractors, Coristine Building. Architect, James E. Adamosn.

Messrs. E. & W. S. Maxwell, architects, 6 Beaver Hall Square, have awarded the general contract for alterations to property on McGill College avenue, for E. M. Renouf, to Sparrow & McNeil, general contractors, Coristine Building.

Sub-contract for the glazed terra cotta for the new Blumenthal Building on St. Catherine street west, has been awarded to Messrs. G. W. Olliscroft & Son, Limited, Hanley-Stoke-on-Trent, England. Architects, Agilvy & Mitchell, associated, 127 Stanley street. General contractors, D. G. Loomis & Sons, Cote St. Paul.

Sug-contract for the plumbing and heating for the Holland Varnish Company's factory, has been awarded to John A. Gordon, 301 St. Antoine street. Architects, T. Pringle & Son, Limited, Coristine Building. General contractors, Geo. W. T. Nicholson, E. T. Bank Building.

Oshawa, Ont.

[illegible] and Colborne streets, for the MacLaughlin [illegible]

Winnipeg, Man.

J. H. G. Russell has awarded the contract for the construction of a seven storey warehouse for J. D. McArthur on McDermot avenue, to A. Simmons. The price of the building is $65,000.

The contracts for the building of a five-storey, reinforced concrete and brick warehouse, for Joseph Brown on Princess street, have been let by J. H. G. Russell, architect, as follows: W. J. Davidson, masonry and concrete; Gray & Company, carpentry work; and A. B. Ormsby Company, sheet metal and fireproof door and window contracts.

Power Plants, Electricity and Telephones

Brockville, Ont.

The Brockville Light & Power Department asked tenders for the erection of a new power house adjoining the waterworks pumping station for the purpose of combining the plants, but the figures were so high that it was deemed wise to do the work by day labor.

Blyth, Ont.

Tenders are being called until July 27th for erection of municipal telephone system for Blyth Telephone Company. Plans, etc., at office of the engineer, G. J. Beattie, 109 Victoria street, Toronto, and at office of A. Elder, secretary, this place. L. [illegible], president.

Chicoutimi, Que.

The ratepayers voted down the negotiations for loan of $70,000 to be used in making payment to the Saguenay Hydraulic Company, upon part of its property desired for municipal lighting system.

Camrose, Alta.

The by-law authorizing the issue of $30,000 debentures for an electric light plant was carried. The installation will be begun at once and hurried to completion. Mr. Maxwell, B.S.C., has charge of the work.

Edmonton, Alta.

City Engineer Latournel submitted the detailed plans for the east end extension of the street railways. Tenders will be called for immediately and construction begun as soon as possible.

London, Ont.

The time for opening tenders for electrical pumping equipment at Springbank has been extended until August 8th. H. J. Glaubitz, C.E., consulting engineer, Toron[illegible]

New Hamburg, Ont.

[illegible] cal apparatus for this municipality have been sent in: Puddicombe Estate, $7,560; C. H. Burgess & Company, $7,464; W. A. McKenzie & Company, $7,450; Brentt Noran & Company, $7,344. None of these were accepted. W. Millar, clerk.

Ottawa, Ont.

A building permit for a solid brick transforming station to cost $18,000, on south side of Slater street, has been taken out by the Ottawa Electric Company.

Stratford, Ont.

This municipality will purchase 800 75 [illegible] Forman Company, of Montreal. Lamps will [illegible]

Victoria, B.C.

[illegible]

(Continued on page [illegible])

Tenders and For Sale Department

FOR SALE

Kelly Steam Pump Horizontal Cross Compound, in good condition, capacity 2,000,000 imperial gallons, must be removed to make room for electric equipment. Inquire the Water Commissioners, London, Ontario. 31

TO CONTRACTORS

Sealed bids will be received by the undersigned up to noon, FRIDAY, JULY 29TH, for all trades required in the erection of a residence in Whitney avenue, Rosedale.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
30 Traders Bank Building, Toronto.

Town of Estevan

Province of Saskatchewan

Electric Lighting and Sewerage

Sealed tenders will be received by the Secretary-Treasurer until 8 p.m. on WEDNESDAY, AUGUST 24TH, 1910, for the following works:

Contract "A"—Pipe-laying on Storm Sewers.
Contract "B"—Power House.
Contract "H"—Two Return Tubular Boilers.
Contract "J"—High Speed Steam Engine.
Contract "K"—Electric Lighting System.
Contract "S"—Sewer Pipe.

Plans and specifications may be seen at the office of the engineers, Winnipeg, and Toronto, and at the Town Hall, Estevan.

J. G. HASTINGS, ESQ.,
Mayor, Estevan, Sask.

L. A. DUNCAN, ESQ.,
Secretary-treasurer,
Estevan, Sask.

CHIPMAN & POWER, Engineers,
30 Winnipeg and Toronto.

City of Winnipeg Electrical Distribution System

Tenders for

Underground Cable

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope "City of Winnipeg Electrical Distribution System, Tender for Cable," will be received at the office of the undersigned up to noon on THURSDAY, SEPTEMBER 1ST, 1910, for the manufacture, delivery and installation, 46,000 feet of thirteen thousand volt, three-core cable.

Copies of the specifications and form of tender may be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg.

These specifications may also be examined at the offices of Messrs. Smith, Kerry and Chace, Confederation Life Building, Toronto, Ontario.

Each tender must be accompanied by a certified cheque for one thousand dollars, which cheque will become forfeit to the corporation in the event of the successful tenderer refusing or neglecting to sign a satisfactory contract when called upon so to do.

The city reserves the right to reject any or all tenders or to accept any bid which shall appear advantageous.

M. PETERSON.
Secretary.

Board of Control Office
Winnipeg, July 15th, 1910. 31

Tenders for

Pumping Engine

Tenders will be received by the undersigned up to AUGUST 1ST, NEXT, for a Compound Duplex Pumping Engine, capable of pumping two million imperial gallons per day, against a head of 125 pounds per square inch. A second-hand pump will also be considered.

For further information apply to

H. HYMMEN,
Superintendent Berlin Waterworks.

Berlin, Ont., July 13th, 1910. 30

Tenders for Electrical

Pumping Equipment

London, Ontario

The time of opening tenders for Electrical Pumping Equipment at the Springbank Pumping Station, London, Ontario, has been postponed from July 29th to AUGUST 8TH. All tenderers are requested to have their quotations reach Secretary Ellwood of the Board of Water Commissioners before noon of that day.

H. J. GLAUBITZ, C.E.,
30 Consulting Engineer, Toronto, Ont.

Steel Viaduct

on Queen Street East

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon, on TUESDAY, SEPTEMBER 6TH, 1910, for the construction of a steel viaduct on Queen street in the City of Toronto, crossing over the River Don, and the roadways on each side, and over the tracks of the Canadian Pacific, Canadian Northern ,and Grand Trunk Railways, including the following approximate quantities:

Excavation (ordinary)—5,400 yards.
Excavation (trenches)—2,300 yards.
Filling—24,000 yards.
Concrete reinforced walls and footings—1,570 yards.
Concrete reinforced floor slab—880 yards.
Piling concrete—10,400 lineal feet.
Steel reinforcing rods—113 tons.
Reinforcing fabric—20,000 square feet.
Structural Steel—752 tons.
Paving (wood block)—3,010 square yards.
Paving (macadam)—9,000 square yards.
Also Railing, Waterproofing, etc.

Plans and specifications may be seen, and forms of tender obtained at the office of Bridge Department, City Hall, Toronto, and office of "Contract Record, B. 34, Board of Trade Building, Montreal, Que.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer) not members of the City Council, or officers of the Corporation of the City of Toronto, or in lieu of said sureties, the bond of a guarantee company approved of, as aforesaid.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, July 22nd, 1910. 32

Township of Mersea

Tenders for Dredging

Sealed tenders, addressed to Mr. Alfred Hairsine, Township Clerk, Mersea, Leamington P.O., Ont., and endorsed "Tenders for Dredging," will be received for the Dredging required in the Eastern and Western Divisions of the Point Pelee Dredging System, up to 6 o'clock p.m., AUGUST 5TH, A.D. 1910.

Plans, specifications, etc., for the Eastern System may be seen at the office of Owen McKay, Civil Engineer, Walkerville; and plans for the Western System at the office of Alexander Baird, Civil Engineer, Leamington, Ont.

The lowest or any tender not necessarily accepted. 30

Reinforced

Concrete Viaduct

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, AUGUST 9TH, 1910, for the construction of a reinforced concrete viaduct of beam and slab construction on the Weston Road, in the City of Toronto, containing the following approximate quantities:

Excavation—1,068 cubic yards.
Concrete (retaining walls)—472 cubic yards:
Concrete (viaduct)—577 cubic yards.
Reinforcing steel—126,000 pounds,
Also Pipe Railing, Waterproofing, etc.

Plans and specifications may be seen and forms of tender obtained at the office of the Bridge Department, City Hall, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer), not members of the City Council, or officers of the Corporation of the City of Toronto, or in lieu of said sureties, the bond of a Guarantee Company approved of as aforesaid.

The usual conditions relating to tendering as prescribed by the city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman of Board of Control.

City Hall ,Toronto, July 22, 1910. 31

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 inch x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

CONTRACTOR'S OUTFIT FOR SALE—Six Wheeler, No. 3, concrete line plant, nearly new. Owner going into another line of business. Joseph Patterson, Box 114, St. Marys, Ontario. 35

The B. C. Gazette gives notice of the incorporation of the following camponies:—Canadian Doorhanger Manufacturing Company, Limited, capital, $50,000; Quain Electrical Supply Company, Limited, capital, $50,000; Great West Light Company, Limited, incorporated to install lighting systems within the Province of British Columbia, etc., capital $10,000; Producers Rock & Gravel Company, Limited, capital, $350,000; Anvil Island Brick Company, Limited, capital, $100,000; British Columbia Electrical Supply Company, Limited, capital, $25,000.

Power Plants, Electricity and Telephones

(Continued from page 27)

for installation of system of cluster lights. Plans at office of W. W. Northcott, purchasing agent, City Hall.

Winnipeg, Man.

Tenders addressed to P. E. Ryan, secretary, commissioners Transcontinental Railway, were received at Ottawa, until July 26th for wiring system, switch board and transformers in connection with the locomotive shops of the Transcontinental Railway.

AWARDED.

Fleming, Sask.

Tenders for telephone construction were received as follows: Wm. Bobier, Fleming, $385 (accepted); Berwick & Laster, Miniota, $418; Somerville & Taylor, Regina, $540.

Winnipeg, Man.

We are informed that the contract for supply of two sets of line disconnecting switches for the transmission line system, has been awarded to the Western Iron Works, Limited, Winnipeg, for the sum of $2,258.

The city council has accepted the tender of the Northern Electric Company for the supply of 9,000 pounds, No. 2, B & S, DB weatherproof solid copper wire, required for power line to No. 7 well, at $16.45 per hundred pounds.

Miscellaneous

Montreal, Que.

Recent building permits include; Mrs. G. A. Campbell, 223 Milton, residence, $7,000; Mrs. Wm. Clelland, 51 Durocher, residence, $7,000; J. B. Julien, 125 Church street, two houses containing three dwellings and two stores, $12,000; W. Langlois, 1138 Simard street, house containing two dwellings, $2,900; Congregation of Jerusalem, 2487 Papineau avenu, church building, $3,000; H. Debellefeuille, 70 Laconte street, house containing three dwellings, $3,700; J. L. Gravel, 1359 St. Catherine east, house containing five dwellings, $5,500; Jos. Pepin, 1279 Ontario east, two houses containing two dwellings, $8,000; Napoleon Paquin, 580 Carieux, house containing two dwellings, $3,000; Alex. Shields, 162 Grand Trunk, house containing two dwellings, $6,100; H. Jacobs, 29 Hermine, residence, $3,500; M. Leduc, 318B Dufferin street, house containing three dwellings, $3,000; E. Bradbury, 160 Forsyth, residence, $3,000; E. Masse, 1221 des Erables, two houses containing six dwellings, $5,000; Thompson & Ticehurst, 1795 Christopher Colomb street, house containing three dwellings, $3,000; D. L. Dupre & Company, 567 Delormiere, three houses containing nine dwellings, $9,000; H. S. Phillips, 500 Guy, two houses containing six dwellings, $22,000; Advance Realty Company, 4160 Sherbrooke street, two houses containing twelve dwellings, $40,000; P. Chapleau, 2443a Waverley, two houses containing five dwellings, $5,000; J. A. Stevenson, 716 Dorchester west, alterations to residence, $3,500.

Ottawa, Ont.

A preliminary notice has been issued by the Naval Service branch regarding the construction of ships of the Canadian Navy. Under the conditions imposed tenderers must have a ship yard capable of building a ship of the Bristol type, or be prepared to construct such a yard within a year. Under the Rush-Bagot Treaty no ships of war are to be built on the Great Lakes.

Tenders addressed to P. G. Keyes, secretary, Department of the Interior, will be received until September 1st for furnishing of iron posts for use on survey of Dominion lands, to be delivered at Winnipeg, Prince Albert, and at Edmonton.

Recent building permits include: F. Diamond, brick dwelling, Archibald street, W. Gibson, builder, $8,000; Water Street Hospital, alterations, W. E. Noffke, architect, T. J. Fautany & Company, builders, $12,600; H. A. Caplin, storehouse, Queen street, G. Stewart, builder, $3,600; A. Monette, dwelling, Holland avenue, $2,500; Isabel Whyte, alterations to dwelling, Cartier street, C. J. Burritt, architect, J. Robertson and A. G. Marshall, builders, $4,000; Mary Graham, dwelling, Daly avenue, A. Tomlinson, builder, $2,800; W. Shenkman, dwelling, Rideau street, $3,500; R. B. Stethem, dwelling, Kent street, $2,500; J. G. Elliott, shop and apartment, Bronson avenue, $8,000.

AWARDED.

Victoria Harbor, Ont.

Messrs. Edge & Gutteridge, Seaforth, have been awarded the contract by the C. P. R. for the erection of four residences, station, coaling plant, turn table, ash pit, boarding house, store and oil house, machine shop and engine house, ship stores, ice house, offices, laundry and boiler house here, the terminus of the Victoria Harbor & Peterborough line. Construction has been commenced.

Vancouver, B.C.

The contract has been let to W. Finney for the 2-storey brick apartment building on Denman street for Mr. W. S. Hugo. Messrs. Thornton & Jones, Hastings street, architects.

WATERPROOFING CONCRETE.

According to Prof. Ira L. Baker, when alum and soap are used as waterproofing for concrete, the alum in powdered form may be mixed with the dry cement or the sand, and the soap may be dissolved in the water employed in mixing the concrete; or both the alum and the soap may be dissolved in the water. The former is probably the safer method in practice, since with the latter method the water must be thoroughly stirred while the two are being mixed or the precipitate may form in large masses which it is practically impossible to break up; and, further, the water must be kept stirred to prevent the compound from accumulating on the surface. However, the alum is more easily dissolved than the soap; and hence the alum may be dissolved in, say, one-fifth of the water, and the soap in the remaining four-fifths, and then the two portions may be mixed together. The alum and the soap combine and form a finely divided, flocculent, insoluble, water-repelling compound which fills the pores of the concrete and decreases its permeability. The best proportions are: Alum one part and hard soap two parts, both by weight. Soap varies in its chemical composition, and hence a single proportion cannot be stated which will be chemically exact for all cases. The above proportion is in round numbers the relative combining weights of alum and average hard soap. Any reasonably pure soap will do. It is difficult to dissolve more than about 3 per cent of hard soap in cold water; and hence this practically limits the amount of alum to 1.5 per cent., and of the soap 3 per cent. These amounts will give a precipitate equal to about 3 per cent of the weight of the total water. The amount of precipitate formed in the pores of the mortar or concrete will depend upon the amount of water used in the mixing.

The bridge recently completed across a deep gorge, with vertical sides some 170 ft. high, on the Bellegarde-Chizery Railway in France, justly ranks among the greatest works of the kind in the world. The main arch of 262 ft. 9 1-2 in. span springs from the solid rock on either side of the gorge, the thickness of the rib being 4 ft. 11 in. at the crown and 8 ft. 2 in. at the springings. Eleven spandrel arches with semicircular openings surmount the main span, and serve the purpose of carrying the roadway above. As the crown is at the height of more than 215 ft. above the level of the stream running along the ravine, some particularly interesting falseworks were necessary before construction could be commenced in earnest. These comprised three lofty timber towers 133 ft. high, and an elaborate arrangement of braced centring, the whole including nearly 22,000 cubic feet of timber and about 30 tons of steel. To obviate any inconvenience from settlement of the falseworks, the arch was built in eight sections, finally connected by closing voussoirs. This remarkable bridge, designed by M. Picard, Chief Engineer to the Bridge Department of the railway company, was commenced in August, 1908, and the masonry finished in August last year, although the centring was not struck until early in November. It is stated that no settlement was noticed, and that the total cost of the work was less than $90,000.

SANDBLASTING BRICK FRONTS.

An expert in the sandblasting trade who has operated on many buildings, on being asked as to the efficiency of the sandblast upon soiled brickwork, said that he could not advise it except when the bricks were extremely hard. When used against stone the blast does not remove the original face, he said, ''only the grime'' That is the aim of the skilful operator. But in the case of brick not extremely hard the result might be different.

The great force with which sharp sand can be driven through a fine nozzle is very great. If permitted it would actually cut a stone in two in time. In the case of granite, marble, and cut stone, the skilful operator preserves the original face of the block, but he cannot guarantee to do so with respect to all sorts of front brick. He would advise cleaning front brick with acid instead of sandblasting. The same opinion seems to be held abroad. The cleaning of brick fronts was the interesting subject of a paper recently read before the German Association of Brick and Terra-Cotta Manufacturers. The author protested against the use of sandblast or any other method by which the original face of the brick would be taken away or be likely to be disturbed, saying:

''When the blast is used, and the face of the brick taken off, the cleared front will show a good appearance only for a short time, as the brick with the original face removed will be very much more porous than before, and absorb dirt more readily. The use of steel brushes is also very bad and will not give a first-class job. The best method is cleaning the brick fronts with a solution of muriatic acid. The strength of the solution can be made to 1 in 12. When this solution is too strong for the [illegible] would be used. A good soap solution will, as a rule, take off all thick dirt, and the cleaning with acid solution can then be done easily.''

''The Building Age.''

Interesting Injunction Suit

Evidence in the injunction proceedings instituted by Messrs. Hyde & Webster, supply dealers, to restrain the city of Montreal from contracting for a supply of scoria blocks to meet their requirements for the ensuing year, has all been received and it is expected that Mr. Justice Guerin will shortly render his decision in the case.

The chief point of contention on the part of Messrs. Hyde & Webster in instituting injunction proceedings was that on a certain day the city authorities, namely the Road Department had called for tenders for supply of three million artificial paving blocks, while on the same date they had asked tenders for the laying of four million scoria or artificial paving blocks. This company also claimed that the tender form received by them asked for a quotation on one hundred and eighty thousand artificial blocks, whereas other supply men had been asked to figure on three million.

The city's defence on this point was that they did not mean to specify scoria particularly, yet notwithstanding, the evidence went to show that in the tender forms the words "tenders on paving blocks" had been struck out, leaving the word "scoria" standing alone.

Mr. J. B. Fellows, city engineer of Westmount, testified that he had used artificial and natural blocks for years. He put scoria on heavy traffic streets and the Metropolitan in other streets where the traffic was lighter. In short, he thought the scoria were less breakable than Metropolitan, the latter being liable to be attacked by varying temperatures.

Mr. C. A. Jaques, of the Jaques Steamboat Line, said that he had had the contracts to carry the Metropolitan blocks from Toledo, Ohio, to Montreal, and he thought he was safe in stating that not more than five blocks per thousand broke in handling them.

Dr. Milton Hersey, city analyst, testified to having made analyses at various times. Tests, made a short time ago by means of the brick rattler, recognized as the standard by the United States Government, showed the following losses in weight by abrasion: Metropolitan, 16.03 per cent.; Massillon, 11.28 per cent., and Scoria, 9 per cent. Referring to a report he had made in 1908, for Messrs. Hyde & Webster, Dr. Hersey stated that on this occasion the Metropolitan blocks lost 17.75 per cent. by weight and the scoria 30 per cent., which would point to the belief that the former were more uniform in manufacture. In concluding his report in 1908, Dr. Hersey stated that there was no doubt whatever in his mind but that Metropolitan blocks were infinitely superior to scoria blocks.

Major H. C. Lordy, civil engineer in charge of construction of the Lachine Canal, said that in 1908 he had used both Metropolitan and scoria blocks in paving work on the wharf at the foot of McGill street. In the handling of these two kinds of blocks he had found that the breakage on 40,000 scoria blocks was as heavy as that on 280,000 Metropolitan blocks. Since then he had made examinations of both blocks, in actual paving in different parts of the city, and had come to the conclusion that the Metropolitan block was superior to the scoria, bith in initial handling and in use.

Mr. J. N. Nelson, 35 years civil engineer for the Harbor Commissioners, said they had used thousands of scoria blocks between 1902 to 1908, and that they had stood well in exposed places, the principal reason being that they were carefully made. In 1908 when tenders were called for paving blocks he took the samples submitted, and in a rumbler in Parker's foundry, found the percentage of loss was less for Metropolitan than scoria, being six per cent., while the other ran eight to nine per cent.

Mr. W. H. Walker, paving block expert, stated that the scoria block is a casting and has all the weaknesses that castings have—blow holes, bubbles, etc. He had found scoria porous and spongy.

Mr. Ernest Marceau, engineer in chief of Government railways in the Province of Quebec, said homogeneity was a great factor and there were holes in the depth of scoria while none existed in the Metropolitan.

Mr. Emile Vanier, formerly engineer for St. Louis, testified to having superintended the laying of both scoria and Metropolitan. He thought that scoria was the superior block. The texture of Metropolitan, in his opinion, was less uniform than that of scoria. He had found that a quantity of Metropolitan were very friable and were broken easily. This, he had noticed when some of the Metropolitan were being unloaded.

Messrs. Hyde & Webster claimed that the Metropolitan blocks in St. Louis had been laid under most disadvantageous circumstances, a great number having been placed in position during the winter month of December.

J. Anderson, of the Standard Construction Company stated before witness that one of the chief clerks in the Road Deparement had remarked that there was no use tendering on any material other than scoria.

Money Flowing Into Montreal

Record breaking development in the establishment of new manufacturing concerns in Montreal has been going on during the last three months. In fact capital reaching a total of $42,128,900 has been invested in 54 new manufacturing concerns incorporated under Ottawa or Quebec charters since April, all of which will make their headquarters in Montreal or in its immediate vicinity.

Several of the new incorporations represent English firms which are establishing branch industries in Montreal but a greater number are American concerns which had apparently been waiting until the settlement of the tariff negotiations had inspired more confidence in them to cross the border and establish plants there.

Among the new industries are two pulp mills, one with a capital of $1,000,000 and the other with $100,000 invested, these being among the first direct moves to follow the pulp wood policy prohibiting the export of pulpwood cut on Crown lands in Quebec. There is also a new lumber company with half a million capital.

The Montreal Herald Disaster

Editor, "Contract Record":—

Dear Sir,—In the July 13th issue of the "Contract Record" on page 50, under the heading of "The Montreal Herald Disaster," I read the following: "Building Inspector Chausse stated that in 1905 a permit has been granted, etc." This is not correct, as in my testimony before the coroner I stated that since the Herald had bought the building in 1905 no permit had been applied for and consequently had not been granted. All work of alterations and repairs done to the Herald building since 1905 were done without any civic authority or permission.

Yours very truly,
Alcide Chausse,
Architect, Inspector of Buildings.

"A Foine Country!"

Mike—"Sure, Pat, this do be a foine town to wurruk in."

Pat—"How's that?"

Mike—"Be jabers, Oi was wurrukin' in this same spot lasht wake putting the strate down for the city ingineer; to-day Oi'm tearin' it up for the waterwurruks; an' nixt wake Oi'll be in the same place for the gas wurruks. 'Tis a foine country, bedad."—Victoria Times.

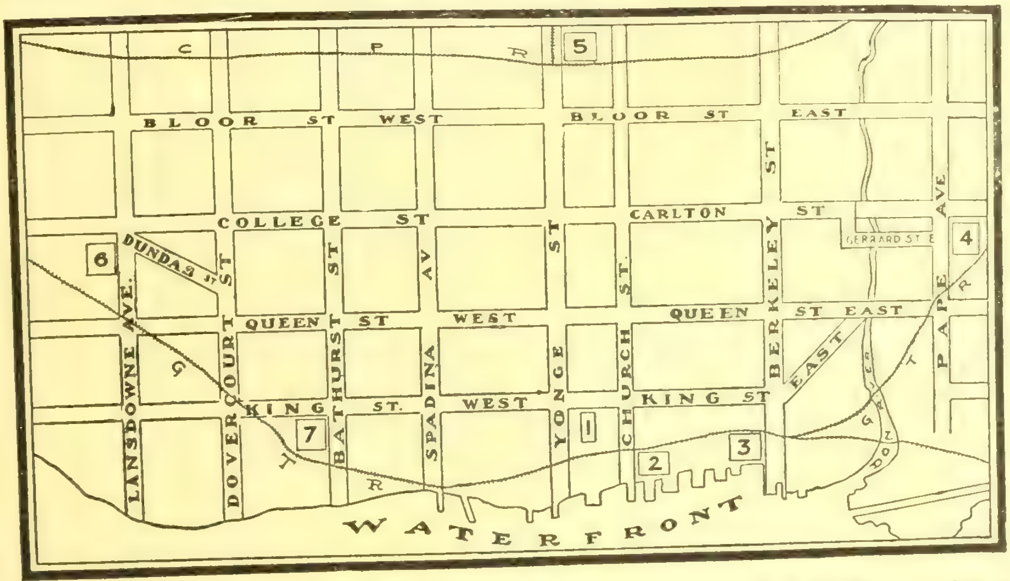
Appropriations provided for Winnipeg's civic improvement works are almost exhausted and less than two-thirds of the work projected has been started. This condition means that very little more work will be ordered this season.

The city of Winnipeg is about to advertise in every large city of the continent for a manager for the civic power plant.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5



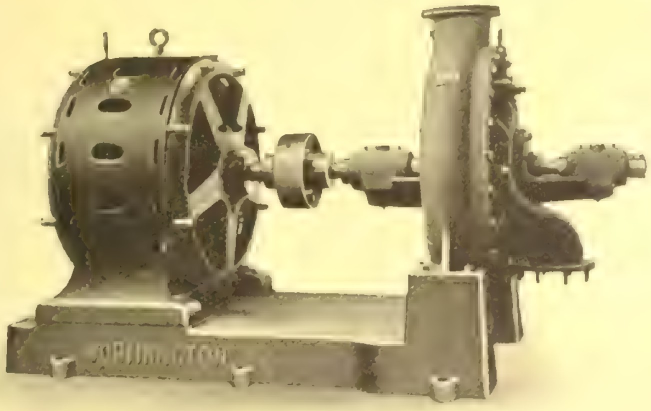
No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is

PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, **Toronto**

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

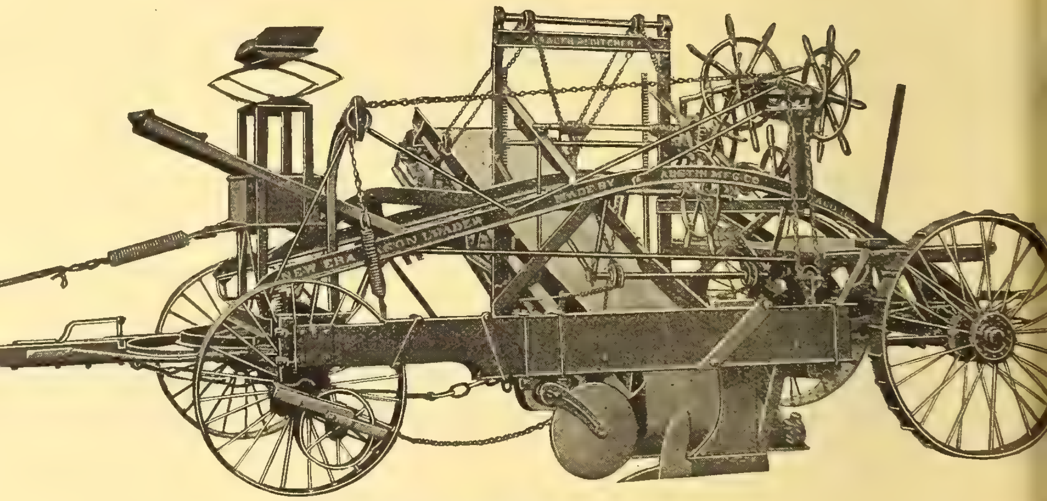
SEND FOR DESCRIPTIVE LITERATURE

WORKS: 512 WILLIAM ST., MONTREAL

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
Limited

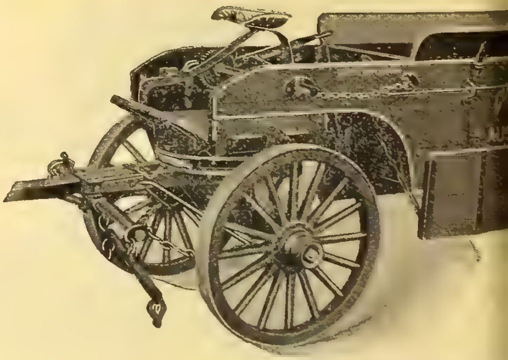
Elevating Graders

for Railroad Grading, Irrigation Work, Municipa Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment



Austin Dump Wagon

Head Offices and Warehouses :

Montreal

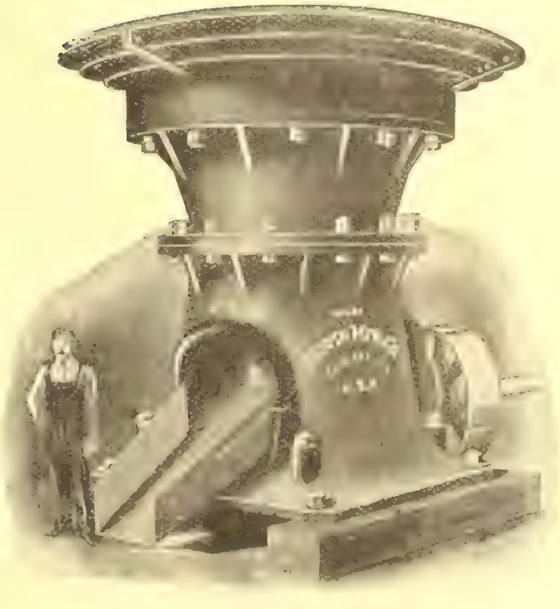
MUSSEN

mplete Rock Crushing Plants

signed and Supplied

- Crushers
- Elevators
- Screens
- Bins
- Hoists
- Derricks
- Rock Drills
- Drill Steel
- Cars
- Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

3rd Edition is Out

and free to Architects, Contractors and Engineers

Glidden's Advanced Finish Booklet for Modern Building Construction

gives full data and specifications covering the finishing and waterproofing of concrete

Address

The Glidden Varnish Company, Cleveland, Ohio
Concrete Finish Department

or

Stinson-Reeb Builders Supply Co., Montreal, Quebec

FACTORIES
Cleveland, Ohio,
Toronto, Ontario

BRANCHES
Atlanta, Boston, Chicago,
New York and St. Louis

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 2016—Type-Metal Inter-phone for desk use

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 413 with full particulars.

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto July 27, 1910 No. 30

Government's Consideration for Railroad Development

The Dominion Government is at last easing the immigration regulations in regard to laborers on railway construction. The following memorandum has been issued:

"Owing to the great scarcity of railway laborers it has been decided to admit from all countries except Asia, railway construction laborers who are mentally, morally and physically fit, willing to work, and who are guaranteed employment by railway contractors or railway companies irrespective of money qualifications or direct journey."

This means that for the time being railway construction men are placed in practically the same position in so far as immigration regulations are concerned, as farm laborers have been in the past. It also means that contractors in the prairie provinces and on the Pacific coast will be able to secure large numbers of Scandinavians and other first class construction men who, under the strict interpretation of the immigration regulations, might be debarred either for the lack of the required $25 or for not coming from the country of birth or naturalization. This alteration in the regulations is of especial importance to railway contractors in view of the fact that operations have been considerably curtailed across the border and first class men are therefore easily available.

The Government is to be congratulated upon this step—tardy though it may be. It is as essential to the trade of the country to have good transportation facilities as it is to have a good crop, and it was dull witted nobody to tie up with red tape the brawn and muscle needed so badly by western railroad contractors. If a man be "mentally, morally and physically fit" and, in addition, "willing to work," he represents about the highest ideal ever fulfilled by a railroad laborer. Let us have immigration regulations—and let us enforce them—but for Heaven's sake let those regulations be of a *defensive* and not of an *offensive* character. If we take in criminals and such like we have ourselves to blame. If we shut out the very men we most need, we go down to posterity as imbeciles.

The following paragraphs, culled from a Winnipeg despatch of July 15th, show the gravity of the situation brought about by the old enactment:

"An acute labor problem is confronting the construction contractors for the mountain section of the National Transcontinental Railway.

"Messrs. Chamberlain & Stewart, contractors for the mountain section, have intimated that it is impossible to complete the section in reasonable time unless they can get more labor.

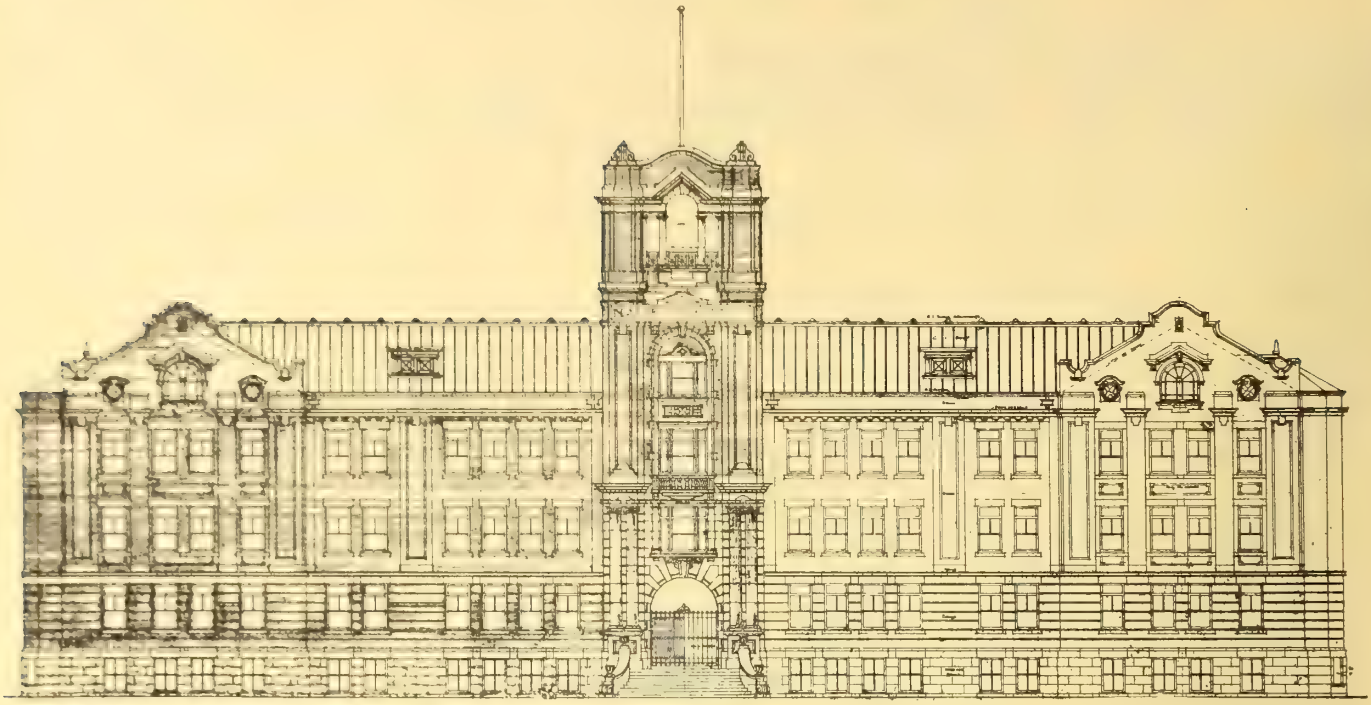
"Existing immigration regulations provide that no foreigner can come into Canada except directly from his native country. It is understood the regulation was designed to deal with drifting Asiatics.

"United States railways are shutting down in construction to a certain extent, and many foreigners accustomed to railway work are out of jobs. Under the regulations they can not be hired in Canada. Contractors report that they cannot get labor although they are offering $2.25 to $3 per day with board. They have 1,600 men at work and ought to have over 5,000.

"Chief Government Engineer Collingwood Schreiber, in charge of the western division of the Grand Trunk Pacific, reports to the Minister that he cannot complete the work in time unless labor is immediately secured. The contractors engaged hundreds of men from the United States, but they were turned back at the border by officials of the Department of the Interior under existing regulations."

British Columbia's New Regulation

The impression is pretty general that British Columbia's new regulation, causing incorporated companies wishing to do business in that province to obtain a license, is an imposition. Especially is it a cause of loss and inconvenience to Ontario concerns. Inconvenience of this kind, however, we venture to think, will ultimately militate ten-fold against the interests of British Columbia. An instance of this in a small way is provided by the case of the Ontario Wind Engine & Pump Company, which had arranged to open a branch in British Columbia this summer, but which has given up the idea since the new provisions have come into effect The principle underlying regulations of this kind is a very narrow one and it is to be hoped, in the interests of Western Canada generally, that the example of British Columbia will not commend itself to the neighboring provinces.



Technical High School, Winnipeg, Man.

Appropriateness of Design, Excellent Interior Arrangement, and Modern Equipment —Progressive Manitoba Metropolis Alive to Importance of Industrial Training

For some years the Winnipeg Public School Board has realized the growing importance of technical training, and the desirability of having suitably designed buildings, properly equipped, in order that the pupils attending the Winnipeg schools may have the opportunity of better fitting themselves for the ever-increasing competition in the industrial world of to-day.

It was accordingly decided to erect two buildings, one at either extremity of the city, to form centres toward which all the pupils from the graded schools would gravitate. The present policy of the board is to place in the central portion of the residential section of the city another technical high school, with possibly several new features, which will be the arch stone of the educational system of Winnipeg.

The two buildings, for which contracts were awarded on the 14th ult., will cost $300,000 each, exclusive of plumbing, heating and ventilating plant. They will be built of Tyndall cut stone and Estevan red pressed brick on concrete foundations, and will be equipped with every modern improvement. The buildings will have a frontage of 220 feet and a depth of 180 feet.

A comprehensive idea of the plans of the buildings may be obtained from the following description of the interior:

The basement will be occupied by the boiler room, heating and ventilating plant, and a machine shop, forge shop and woodworking room, each 40 by 80 feet; a mechanical drawing room, 34 by 28 feet; a plumbing shop, 28 by 30 feet locker rooms in connection with each of these, 14 by 26 feet; electrical shop, 40 by 60 feet; and boys' and girls' shower baths which are situated immediately under the gymnasium.

The ground floor comprises main auditorium, 50 by 80 feet; household science room, 40 by 44 and 28 by 34 feet; six classrooms and boys' and girls' retiring rooms.

The second floor contains principal's office, 20 by 24 feet; running track and gallery of gymnasium, seven classrooms and a library, 28 by 40 feet.

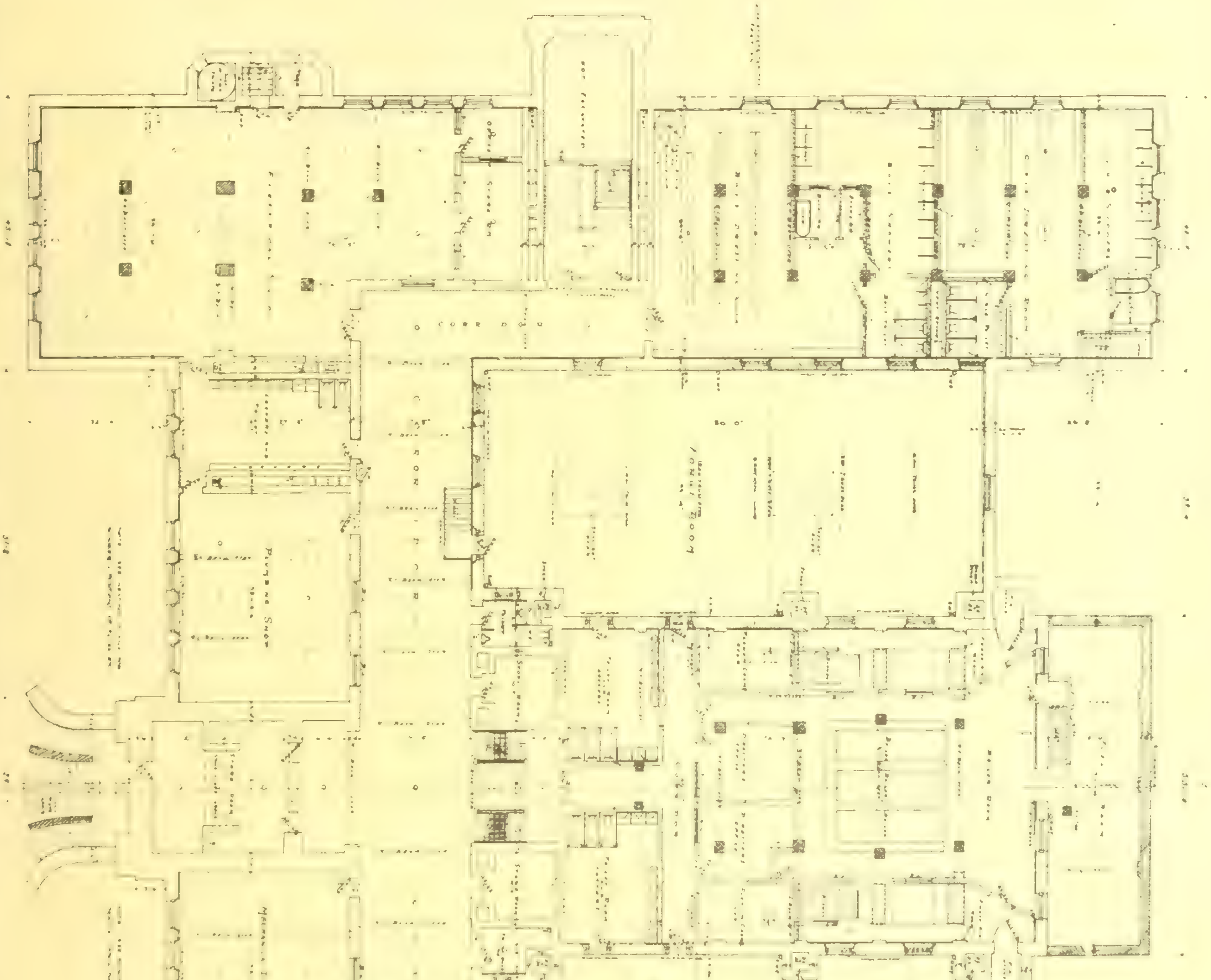
On the third floor are a museum, 20 by 24 feet; physics laboratory, 40 by 42 feet; chemical laboratory, 28 by 34 feet; household art room, 50 by 50 feet; plant room, 24 by 34 feet, and seven classrooms. The interior finish throughout will be in keeping with the character of the building.

There will be one entrance at the front of each building and two at the ends, giving three separate flights of stairs. All stairs and floors will be fireproof in construction. In addition to the staircases there will be two spiral fire escapes encased in brick walls. The central tower extends upwards of 100 feet from the street line and gives an effect of stability and finish to the structures.

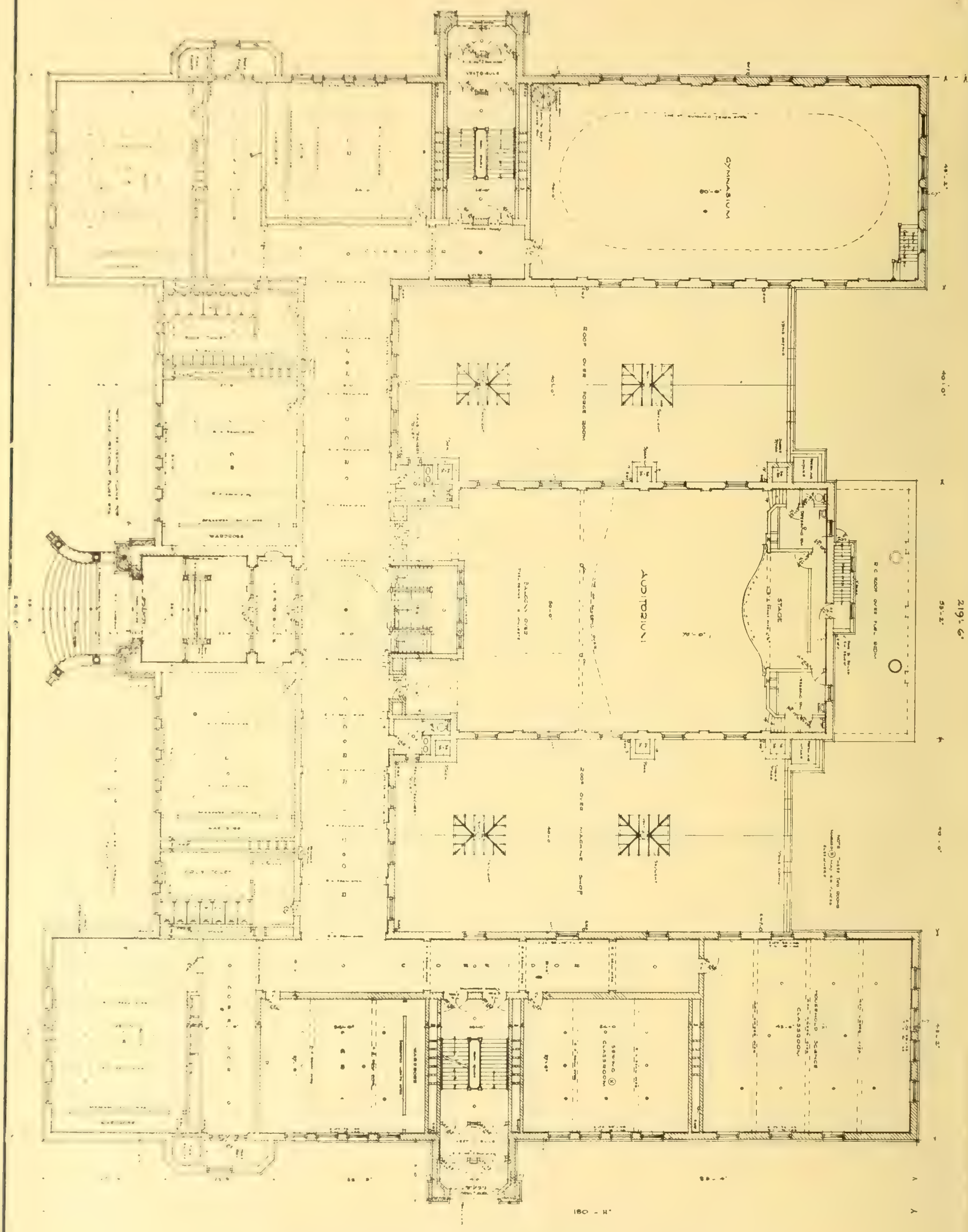
The buildings were designed by Mr. J. B. Mitchell, Commissioner of School Buildings, Winnipeg, and are being erected under his personal supervision. The general contractors for the work are Mr. John Saul and Messrs. J. H. Tremblay & Company, Limited, contracts being awarded in both instances at slightly under $300,000.

Victoria, B.C., aldermen are discussing the relative merits of a cement concrete base and an asphalt concrete base for their road construction work. By means of the latter method the contractor claims that the city will save $7,000.

M. P. Cotton, Vancouver, B.C., as previously noted, has the contract for constructing the Burnby line of the British Columbia Electric Railway from Vancouver to New Westminster, B.C. The contract includes 100,000 cubic yards of earth excavation and six small trestles.



Basement Plan, Winnipeg Technical Schools



First Floor Plan, Winnipeg Technical Schools

The Planning of Undeveloped City Areas

Logical Routes for Transportation Lines—Existing Roads in their Relation to Future Development—Desirability of Municipal Blocks

By N. P. Lewis

In most American cities whose growth is conspicuous additions are made from time to time, and frequently these additions have already been exploited by the suburban developer. They are often so limited in area that it is difficult to do anything but extend the already established city plan over them or accept the street lines which may have been adopted by the local authorities or fixed by the real estate developer. It occasionally happens that an extension of the city limits will include large areas where there are a number of centres of population, and that these centres are disconnected and can be absorbed in a larger city plan without serious detriment to the latter. Areas of this kind contiguous to a large city are almost invariably traversed by highways which have been established for many years and which follow natural lines of traffic. These old roads are the logical routes for transportation lines such as electric railroads, and they can be made the controlling features of the city plan.

The first thing to do is to determine the relative position of the different parts of the new territory and the different existing highways with respect to the remaining portions. This can only be done by a triangulation, which will establish points whose precise relative positions will be known, these points being, say, not less than 2,000 feet or more than 5,000 feet apart. It will then be possible to proceed with the mapping and planning in widely separated sections of the new territory with a positive knowledge of the relation of the street lines which will be established in one section to those in another.

Existing Roads Skeleton of Future System

The next thing to demand attention is the system of existing roads. These should form the skeleton of the future street system. In many cases it will be necessary to straighten them, and in all cases to widen them, but wherever possible the new lines should be parallel with the old ones, so that the old roads may become a part of the new street with as little disturbance as possible and without sacrificing the trees. They should, in most cases, be not less than 100 feet in width, and in some instances even wider. It is unnecessary at this time to discuss the subdivision of the streets which are to exceed 100 feet in width, but if the old road was fortunate enough to have good shade trees, the original highway can probably be preserved for pleasure driving while another section can be reserved for railroad tracks, and, perhaps, still another for automobiles, with adequate sidewalk spaces. Such an arrangement for the separation of different kinds of traffic will require a total width of about 150 feet or even more.

These old roads which are the basis of the city plan may have been nearly parallel with each other or they may have been approximately radial, while the cross connections may have been infrequent or unimproved, but these cross connections will be a necessary feature of the final city plan and must therefore be carefully considered. They should be straight between the parallel or radial highways wherever possible and should join them at points where there are deflections. At these intersections there can well be an enlargement of the street area, creating plazas or some decorative space.

As soon as this system can be determined, the property required for the new streets or boulevards should be acquired. The cost could properly be assessed upon the entire territory which will be developed by it, as the benefit will not be merely local, but their establishment will be the first step toward the development of the entire suburban area. If the whole system of arterial streets could be acquired under a single condemnation proceeding, it would be advantageous.

When these controlling streets shall have been definitely determined the city plan is fairly safe. Whether it would be advantageous to have the intervening spaces treated in a uniform or conventional manner is questionable. The interest of the average citizen it not in the map; it is in the street system itself, and it might be preferable to allow these various subdivisions to develop along lines of least resistance, without exercising too much control over them. In fact, if the treatment of these different sections varies, a more pleasing result may be attained.

Reservation for Parks

Parks are a necessary part of any city plan, and they should be given a conspicuous place in designing a city street system. If there is a particular bit of woodland, an elevation with a commanding outlook, or even a piece of lowlying land traversed by a stream, which has not yet been cut up into building lots, it can be most advantageously set aside at this time as a future park. These reservations should be scattered over the entire area so that there will ultimately be some open space within convenient walking distance of every resident of the city. These parks should be connected by adequate roadways, not necessarily straight or even of uniform width, but contracted where the topography would involve expensive construction and again expanded to include a small area which might ultimately become a most attractive feature of our park and parkway system.

As we are dealing with a territory which is at the present time suburban and where detached houses are likely to be always a characteristic feature, it will not be necessary to provide large park areas, and yet parks of considerable size may be exceedingly desirable as playgrounds and places of recreation for these living in the more congested areas in the older parts of the city, especially if they are so located as to be easily reached by existing or prospective transportation lines. It may be deemed unwise to assume that parks will be ultimately needed in the particular localities selected. The city may not grow in the direction and along the lines assumed, but, while it must be admitted that the manner in which any city will expand cannot be predicted with any degree of accuracy, it is not unlikely that this expansion will follow the lines of least resistance, and if encouragement is given by a judicious selection of park areas connected by adequate roadways, and if the controlling features of the street system are laid out along the lines already indicated, the future development is almost certain to follow these lines, and the result

---

*Abstract of paper read at the Rochester City Planning Conference.

will be a city plan which will appear logical and reasonable, rather than a mere accident.

Municipal Blocks

In such a territory it may be useless to speak of the grouping of public buildings, for the important municipal centres will have already been established and will not be moved. There are, however, minor public buildings, such as schools, libraries, public baths and comfort stations, police stations and fire houses, for which provision must be made, and it would be most desirable to set aside here and there what might be termed municipal blocks, upon which buildings of this kind could be grouped in a very effective manner. The park areas and municipal blocks should be acquired at as early a date as possible. It is often very difficult to justify a public expenditure in advance of actual needs when so many demands are being made for urgent municipal improvements in the older portions of the city, but a little foresight in this respect would undoubtedly save many times the sums which will inevitably be required to correct mistakes owing to lack of foresight in providing for what is sure to be required some day.

Caisson of the Quebec Bridge

The following particulars of the above work are contained in a late Quebec despatch, which runs:

The caisson of the Quebec bridge recently built by Messrs. M. P. & J. T. Davis and launched at Sillery Cove, which weighs 1,700 tons, is 180 feet long and 54 feet wide, and when completed will have a height of 68 feet. It is built of southern pitch pine (12-inch x 12-inch) and its cutting edge, which sinks into the floor of the river, is shaped like an equilateral triangle with a 30-inch side.

The working chambers are 8 feet high with walls 2 feet 6 inches thick, which is also the thickness of the roof. There is one tier 12 x 12, and two tiers of 3-inch planks, tongued and grooved. On top of that there is another tier of 12 x 12.

The men work under water until they get down to solid rock. In order to force the water out compressed air must be pumped into the chamber and great pressure is needed. The men who work in the chambers enter by a circular shaft, which has two trap doors. When the first of these is opened the latter shuts, and when the man has entered and closed the top door, a valve is then opened releasing the air in the lower part of the shaft, which is holding the second door up. This release has the effect of closing the top door and opening the second to allow the man to pass below.

Two pipes are used for working the bed of the river. One is a water pipe with a nozzle, which is used by two men to loosen sand and stones, etc. There is another pipe with a foot valve, which establishes a draught and carries up this material by suction up to the top above the caisson. When the solid rock is reached the chambers will be filled with concrete. Then the masonry will be built on top.

There is a good deal of activity going on up at the yard and bridge. Staging is being built at the latter place, where there will be soon six derricks, ten boilers and four air compressors. There will be also four double tracks. There is boarding accommodation on the spot for some two hundred men. Several hundred men are now employed, the majority of whom are Canadians, though there are various other nationalities, including Austrians, Italians and Poles.

The caisson will probably be brought up to the bridge in a few days, and the "sand hogs" will then get to work. These will number 80 to the shift, and at the beginning they will work eight hours. The deeper they go, the shorter will be their shift, since they will not be able to work so long under water under the higher pressure.

A number of interesting features marked the second annual convention of the Master Painters' and Decorators' Association of Western Canada held recently in Winnipeg. Among those who read papers were W. S. Fallis, manager of the Sherwin-Williams Company, Winnipeg, and P. W. Nelson, professor at the Royal Industrial High School, New York. The sessions were held in the fine new quarters of the Winnipeg Builders' Exchange. An interesting event on the programme was a visit to the new St. Andrew's locks. The president of the association is Mr. J. W. Morley, who, it will be remembered, is also vice-president of the Canadian National Association of Builders.

Victoria, B.C., denies the report of a shortage of building materials in that city. It is stated that orders for brick and cement are being filled with the usual promptitude. A short time ago the Vancouver Portland Cement Company had to shut down for repairs, but in spite of this they were able to meet the demand. At present they are working to their full capacity. On the other hand, however, the lumber mills are said to have great difficulties in keeping pace with the market.

Construction work on the Canadian Northern Railway in British Columbia has already commenced, and the entire line from east to west will be completed by 1914.

Oak Bay, B.C., is going to experiment in permanent road making. In order to do this successfully, the engineer has been asked to recommend suitable machinery, etc., for the work.

It is probable that Jacobs & Davies, consulting engineers, New York City, will hand in their report to the city council of Toronto, Ont., on a system of subway railways for the city early next month.

An exchange tells of a man who answered an advertisement headed "How to Save Your Gas Bills." He sent the required amount and in return received a letter instructing him to "paste them in a scrap book."

Forest fires along the Transcontinental Railway in Ontario have destroyed much property owned by the contractors engaged in constructing the line. From Nipigon it is reported that the Pembroke Contracting Company lost camps, powder house and storehouses and supplies to a total amount of $30,000. Anderson & Mann lost two camps and a large amount of supplies; Bonfield & Harvey lost one powder house and Morris & MacKie one complete camp.

In all probability there is no maxim of common law more generally recognized than that of responsibility for one's acts. Particularly must responsibility be accepted when an assumption of special knowledge concerning a given subject leads to employment and the payment of a fee. Even a physician or lawyer, who through neglect, whether by reason of carelessness or incapacity, allows his patient or client to suffer, is liable for damages. An architect's responsibility is not less clear. If he assumes and leads the owner to believe he possesses the requisite knowledge and ability to perform certain services, and in pursuance of such representation undertakes or pretends to render such services, he can scarcely escape responsibility for the results following his acts.—American Architect.

Sewage Disposal Ideas

The ideal site for sewage works is one which is sufficiently far removed from dwellings to prevent any possibility of nuisance arising, and it should be at such a level that the sewage can reach it by gravitation. Where this is not possible, only that portion of the sewage should be pumped which will not gravitate. The subsoil of the site should be suitable for the final process after treatment in tanks and filters.

In selecting the system of treatment, the chief factors to be considered are the character of the sewage to be treated, the extent to which it must be purified, and the fall available at the works. The ideal grit chamber is one that will arrest all the mineral matters in the sewage but none of the organic matter, and it should have special facilities for the removal of the deposit. Screens, if used, must be designed in such a way that they will arrest the matters they are required to intercept but allow all others to pass, and not readily become choked.

There are so many types of tanks that it is extremely difficult to choose the most suitable type. The question is raised as to whether it is essential to have septic action as a preliminary process in all cases. The ideal method is such that it is adapted to the particular character of the sewage to be dealt with, and will produce the most suitable effluent for the filters, while at the same time reducing the quantity of sludge to the minimum, and preventing the possibility of nuisance from smell. In the construction of tanks, attention must be given to the rate of flow through them, and special care must be devoted to the provision of every facility for the removal of sludge.

In the design of contact beds the ideals to be attained are to make them absolutely water tight, to provide a self-cleansing gradient on the floors, and a false bottom over the whole area, and also to select the best material and see that it is properly graded. Another important point is to arrange them so that they can be operated in the proper manner.

With regard to the percolating filters, the ideals as to floors, false bottoms, and material laid down for contact beds, apply with equal force. The question of distribution is of prime importance, and the author considers that continuous distribution, where possible, is more efficient than intermittent. Humus settling tanks or fine grain filters are necessary in order to produce the ideal final effluent.

From the general constructional point of view the ideal works should be executed in such a manner that while they are constructed throughout in a substantial manner and of materials which are the best of their kind, they should contain nothing which has not a direct bearing upon their efficiency in the production of a satisfactory effluent, and their maintenance in a good condition at the least possible outlay for repairs.—C. W. Easdale before the Society of Engineers.

Road Treatment of Terminology

Knowledge of how to do a thing is, of course, more important than the ability to describe it. Nevertheless when, as in the case of the application of road binders, experimenters throughout the country are endeavoring to obtain as quickly as possible the maximum amount of information not only by their own experiments, but by knowledge of what others are doing, it greatly simplifies matters and conduces to much more clear and certain information if an agreement can be reached as to the meaning of terms. The absence of such agreement is being realized as a serious difficulty by officials and others who are now endeavoring to describe the road treatment work which they are doing. Tars and oils are being applied to broken stone roads by sprinkling, by pouring and by injecting in jets having considerable velocity; and this is done to old roads, which have received no preparatory treatment in some cases, while in others they have been relieved of all loose dirt, and in still others they have been brushed or otherwise treated so vigorously as to remove all the dirt above and much of that which is between the surface stones. In new construction, bituminous material is applied in a cold, semi-liquid form, or a material heavy in bitumen is heated before use. This may then be applied by miring it with the stone before this is laid upon the street, or the stone may be rolled and the material poured in afterwards.

Each of these methods of treatment is variously designated by officials in describing their erperiments and work. Many of them, in order to make clear their explanation of such work, have described more or less at length the process adopted each time it is referred to, and this is probably desirable until there be a general agreement as to the meaning of terms which can be applied to at least the more common methods. Several societies have appointed committees to struggle with this question, and there is every probability that some definite conclusions will be reachel before the end of this year.

Meantime there has been a more or less general acceptance of certain terms, and we hope that, unless some good reason be advanced for changing them, they be generally adopted. The term tar macadam, asphalt macadam or bituminous macadam has been applied to the mixture of bituminous substances with broken stone, whether added before or after the latter has been placed upon the road. To avoid the ambiguity thus occasioned there has been a partial adoption of two terms: the application of the bitumen to stone newly placed upon the road being called bituminous macadam, and construction by mixing the bitumen with the stone before laying being called bituminous concrete. These terms are believed to be suggested by analogy, since the bitumen as a binder takes the place of the binder of water and screenings, and in ordinary macadam the binder is placed upon the stone after it has been put upon the road and rolled, never mixed with the stone before application. It is self-evident that the mixing of binder and stone (with or without sand) before application to the road is the same treatment as is given to concrete.—Municipal Journal and Engineer.

In many large cities civic improvement leagues are evolving plans for the improvement of their municipalities along architectural lines. There is room for great improvement in the majority of cities. We are just beginning to realize that while we have progressed commercially we have stood still architecturally speaking. Few of our big cities have anything to commend them from the standpoint of beauty. Their public buildings as well as private structures have been built with the single purpose of making them useful. Group plans have seldom been considered in the past. The country is young and there is ample time for these improvements to be made. As time goes on these changes will cost more. There is no reason why our cities cannot be made as beautiful as those of older countries. We have the wealth and the brains and the materials. All we need is the impetus.

Contracts have been made for the construction of about 7,000 miles of railways in British Columbia within the next three years.

The Properties and Uses of Hydrated Lime

Classification and Most Satisfactory Methods of Manufacture—The Particular Advantages of this Material in Various Kinds of Construction Work

Specially Contributed by A. G. Larsson, C. E., of the Grey and Bruce Portland Cement Company.

By hydrated lime is generally meant, now-a-days, the dry powder obtained by slaking quick lime. In Europe, this product, owing to its many good qualities, has been a commodity of commerce for a long time, and it is therefore astonishing that it was not until a few years ago that it was introduced into this continent. Thinking that it may be of increasing interest to readers of the "Contract Record," I shall, in the following lines, discuss briefly its properties, manufacture and use.

The hydrated lime is, as was said above, obtained from quick lime by slaking. This is the chemical process that takes place when quick lime, acted upon by water, is transformed into calcium hydrate. The following formula expresses the reaction:

$$CaO+H_2O=Ca\ (OH)_2$$

One hundred pounds of lime are, according to the above equation, hydrated with 32.1 pounds of water. A large quantity of heat is thereby generated, and the volume is increased about three and one half times. The formula is a true expression of the reaction only for chemically pure lime. Such a product, however, is seldom, if ever, obtained in the practice, where 98.25 per cent. CaO may be considered the maximum. The other matters found in lime are: magnesia (MgO), silica (SiO_2), oxides of iron (Fe_2O_3) and alumina (Al_2O_3) and underburnt lime ($CaCo_3$). The increasing percentage of the first four (MgO, SiO_2, Fe_2O_3, Al_2O_3) changes the character of the product considerably. On that account we must distinguish between two classes: the "white lime" and the "grey" or "lean" lime. The former contains less than 10 per cent. of the said matters and the latter more than 10 per cent.

The results obtained when slaking white lime will correspond fairly well with the above formula. The process is rapid, and the generated heat and the increase in volume are considerable. The resulting product has a pure white color and is very fine.

The grey limes may be divided into two classes: the "non-magnesian" and the "magnesian." The former has less than 5 per cent. magnesia, and the latter more than 5 per cent.

The dominating foreign matters in the non-magnesian limes are silica, and the oxides of iron and alumina. The group has also been called "hydraulic lime" or "waterlime," as mortars made therefrom will harden more or less in water. Le Chatelier claims that a good waterlime must hold four molecules of lime for each molecule of silica. We generally find that the best kinds hold about 3½ times more lime than clay-matter, ($SiO_2+Al_2O_3+Fe_2O_3$).

As for the second class or the magnesian limes, these should include, theoretically, all the varieties containing from 5 per cent. to 47.7 per cent. magnesia. We find, however, in the practice that the magnesia content is either comparatively low or high, i.e., either close to 5 per cent. or above 30 per cent. From investigations I have found that for Ontario the limits are between 36.87 per cent. and 40 per cent.

The slaking of the grey limes differs from that of the white in several ways. The water required for the hydration is less, the quantity depending on the percentage of magnesia, silica and the oxides of iron and alumina. The reason for this is that the said matters do not take any part in the reaction. Suppose, for instance, 15 per cent. of them are present, then 26.45 pounds of water instead of 32.14 are theoretically enough to slake 100 pounds of lime. The process takes place more slowly than is the case with white lime, and the time is increasing with the greater percentage of magnesia and clay matter ($SiO_2+Al_2O_3+Fe_2O_3$). The point is finally reached when slaking does not take place at all. This occurs when the silica and the oxides of iron and alumina are 30 per cent. or over. It is evident that to secure a thoroughly hydrated product, the slaking must be done very carefully. The slower the process the better the results. The increase in volume is less for the grey than for the white lime.

Two different methods of slaking are in use: the "wet" and the "dry." In the former a great excess of water is used and the resulting product is a slurry, when in the latter only enough is added to hydrate the lime, and a dry powder is obtained.

Before proceeding any further, I would point out the necessity of having the lime well slaked. Suppose, for instance, a part remains as quicklime when the mortar is put into the wall. It will finally slake there under expansion, which in its turn will cause cracks, thus injuring the work. Now, many people claim that the only sure way to get the lime thoroughly hydrated is to use an excess of water. This seems at first thought to be a strong argument in favor of the "wet" process. It should not be forgotten, however, that no matter how carefully the quicklime is prepared it will always contain some overburnt lime. This product hydrates very slowly and will therefore remain intact when the rest is slaked in the mortar box. If there is not enough of it present, the mortar thus prepared will undoubtedly cause trouble. Contrary to what we might think at first, the possibility of this is minimized by the dry process, i.e., by preparing hydrated lime. The reason for this is that those parts, not acted upon by the water, remain almost entirely as lumps, or as a fairly coarse powder which can easily be separated from the fine flour, constituting the slaked material.

The dry slaking is done in several ways. The different methods may be grouped as follows:

Dry Slaking
- Labor
- Machine work
  - Intermittent
    - 1 To a certain quantity of quick lime is added the necessary amount of water.
    - 2 A part of the lime is slaked wet and then more is added to dry the mass.
  - Continuous

There are various methods of slaking by labor. One, for instance, is to dip the pieces in water as long as air-bubbles appear on the surface and then to take them out to slake. The author has found that this way does not give the best results for white limes, but that it works very satisfactorily on magnesian limes, such as are found in Ontario. The reason for less success in the former case is that owing to the comparatively large quantity of water needed the pieces can not absorb enough of it.

Another hand-method used to some extent in Europe is to make a small pile of quicklime about 4 or 5 feet in diameter and 1 foot high, and then pour water on the same. When the most active part of the slaking is over, the mass is shovelled in a steeper pile. More water is now added, if it be needed, or some fine quicklime, if it be too wet. A new batch is then started, and, after being treated the same way, the slaked product is shovelled on top of the other and so on. The resulting large pile is finally left undisturbed, for some days, to temper, i.e., to finish the slaking. The coarse particles are then sieved off and the product is ready for the market as hydrated lime. The author has seen first class products prepared in this way in Europe.

When hydrated lime is produced for the market in large quantities, it is undoubtedly more satisfactory in this country to use machinery than labor. The reasons are those common to any industry and need not be repeated.

Three different stages may be distinguished in the manufacture of hydrated lime:

1. The quicklime is reduced to a fairly small uniform size.
2. The ground quicklime is mixed with water; the slaking proper.
3. The larger grains in the slaked lime are separated.

The first stage, or the crushing, is done somewhat differently in different plants. Some use only fine crushers and reduce the lime to ½ or 1-inch size, and others grind the crushed material so as to leave 15 or 20 per cent. residue on No. 50. The latter method is the best as far as the grey limes are concerned.

We come now to the hydrating proper. The apparatus used for this purpose is either intermittent or continuous. When the former kind is employed, two ways may be followed. One method is to load the hydrating mill with from 1,000 to 2,000 pounds of lime (crushed or ground). To this add the necessary amount of water and then start it working; or we may slake about two-fifths of the quicklime in the total quantity of water and dry the slurry thus obtained by slaking the remaining three-fifths in the same. The hydrator is often a stationary horizontal cylinder, having inside a revolving shaft with pedals for working the mass; or else it consists of a rotating pan with several stationary plows for the mixing.

In every industry efforts are made to develop continuous systems of manufacture. Considerable saving in time and money is thus made possible. It is but natural, therefore, to find this idea introduced in the hydrating plants. The continuous hydrator is either a single, stationary, horizontal cylinder about 30 feet long and 4 feet diameter with revolving pedals, or it consists of several smaller cylinders arranged so that the material travels from one to another. The quicklime and water enter the machine at one end, and hydrated lime is discharged at the other. As it is of importance to use neither more nor less water than is necessary to hydrate the lime, a simple chemical or mechanical test should be applied frequently to regulate the water supply. If not enough water is used, we get a gritty powder that does not work well in mortar. The reaction, causing the same, may be expressed by the formula:

$$2\ CaO+H_2O=HO\text{-}Ca\text{-}O\text{-}Ca\text{-}OH \text{ or } Ca_2O\ (OH)_2.$$

The product leaving the hydrator is transported to bins, where it is kept about 48 hours to temper, i.e., to finish the slaking. From there it is taken to screens or wind separator, where the coarse, not hydrated particles are separated from the rest of the mass. The fine flour thus obtained is ready for the market as hydrated lime.

The separated coarse particles are often discarded. Sometimes, however, they possess excellent cementing qualities and are then ground. The product thus obtained is either mixed with the hydrated lime or put on the market as cement. The well known Lafarge cement is obtained in this way.

The hydrated lime is generally shipped in either paper or cotton sacks. The former are preferable as they make a dust free, airtight package and save the trouble of returning empty bags.

The hydrated lime when made from suitable material and manufactured carefully, is light colored and extremely fine (about 94 per cent. pass No. 200). The specific gravity varies from 2.08 for pure white lime to 2.90 for hydraulic. Being dry, it can be stored any length of time without any detrimental effects whatever. The same can not be said about the quick lime, which by absorbing water and carbonic acid soon becomes worthless. The hydrate should not contain any excess of moisture, because this facilitates the absorption of carbonic acid from the air, thus injuring the product. Hydrated lime has another advantage over quicklime as far as storage is concerned. The latter is known to have caused fires in buildings in which it has been stored, owing to the great amount of heat generated when acted upon by water and carbonic acid. An instance may be mentioned. Over one-half the town of Amal, Sweden, was burned in 1900. It was found, when investigated, that the fire was started by quicklime stored in a barn. As hydrated lime is inert towards moisture and air, there is absolutely no danger of this kind. It can, therefore, be kept in any building that keeps out rain and snow.

Hydrated limes may be divided into the following classes, which are practically the same as those given above for quick lime:

Classification of Hydrated Lime

			$\frac{\text{Per cent Clay Matter}}{\text{Per cent Lime}}$
White Lime			[illegible] .10
Grey Limes	Hydraulic Limes	Weak Hydraulic Limes	0.10—0.16
		Average " "	.16—0.31
		Strong " "	0.31—0.42
	Magnesian Limes	Weak Magnesian Limes	a little over [illegible] Mg o
		Strong " "	over 25% Mg o

The most important use for hydrated lime is as building material. It is then mixed with sand and water to mortar. After being put in place, the latter is dried out by absorption and evaporation. When, however, the moisture finally becomes about 6 per cent., the lime takes up carbonic acid from the air rapidly, forming carbonate of lime. This acts as cement and hardens the mortar. The reaction may be written:

$$Ca\ (OH)_2+CO_2=CaCO_3+H_2O.$$

Besides the advantages pointed out above, the hydrated lime presents here a few others well worth consideration. Masons at first objected to its use because it did not travel quite as easily as lime-putty. This, however, was due to inexperience. With the improved modern methods of manufacture there has been found to be little, if any, difference. Being an impalpable, perfectly hydrated powder, it will give a stronger and better product than it is possible to obtain in the ordinary way of preparing mortars from wet slaked lime. The mixtures (lime, sand) can easily be kept constant, or can be varied at any moment to meet the conditions encountered. The practice of using the same proportions of lime and sand in the mortar, no matter how much the two ingredients are changing, is wrong. Instead of doing so, one should test the materials and then determine the most economical mixture that will safely satisfy the requirements of the job. This would ensure good work and often effect a saving. The lime manufacturer and the contractor should be sufficiently interested in this subject to spend a little money in investigations of this kind, as the results would undoubtedly be of benefit to both.

It is often required that a mortar should harden more quickly or have greater strength than the ordinary one made with lime. Portland cement and sand fulfil these requirements, but the bricklayer objects to the mixture, because it is too lean to handle with the trowel. The difficulty is overcome by adding hydrated lime. The use of lime-cement mortars for brick and stone work is steadily gaining ground. This mixture is also employed successfully for waterproofing purposes. It has been found that the addition of hydrated lime to certain cement-sand mixtures will reduce their permeability for water. The hydrate itself is not waterproof

Its solubility constant L_{15}° is 0.18. The real waterproofer is in this case the calcium hydrosilicate or cement-glue, formed by the hydration of the Portland cement.*

Any mortar is therefore waterproof that contains enough of the latter to close the voids. If that is not the case, the work will be more or less porous and the water will consequently go through. Suppose, now, that the said cavities were filled with lime instead of cement and sealed up with the above mentioned silicate. The result would be a waterproof body, where the cement glue would act in about the same way as a cork in a bottle, in keeping the lime from being carried away by the water. This is, to the author's mind, what takes place when cement mortar or concrete is made water tight with hydrated lime. Enough of the latter should be added to fill the voids and no more, as a surplus would be useless, or even injurious. The reason is that an excess of lime, above what can be protected by the cement glue, will be dissolved, and the result will be a porous structure.

The lime-cement mixture is used a great deal for facing cement blocks, partly to make them shed the water and partly to give them a light color. When mixed with white sand, it is possible to get a block-face white enough for any exterior work.

Hydrated lime plays a very important part in the manufacture of hard wall plaster. Being an impalpable powder, perfectly hydrated and easy to handle, it can be given a very good finish.

The manufacture of lime-sand bricks presents another opening for hydrated lime. As this industry is gaining ground steadily, it will undoubtedly become a good customer. Sharp, comparatively fine sand is mixed with 5 to 10 per cent. lime, and some water is added. The mortar is pressed into bricks, which, after being loaded on cars, are placed in large horizontal iron cylinders. These are closed up and the hardening is done with steam, having a pressure of 100 to 150 pounds per square inch. The time required for the curing depends on the steam pressure and varies from 4 to 12 hours. The bricks are then ready for use. The cause of the hardening is that the hydrate of lime unites with the silica on the surface of the grains of sand, forming a silicate, which, in its turn, acts like cement in binding the particles together. In the author's opinion, white lime is best adapted for the manufacture of lime-sand bricks. Good results, however, are reported from the use of magnesian lime.

A few of the most important uses of hydrated lime as a building material have been indicated above. Before leaving the subject, however, I should like to point out something that would undoubtedly facilitate matters and serve to strengthen confidence in the product. Many contractors, while acknowledging the advantage of using hydrated lime, raise the objection that it is difficult to detect any finely ground admixture to the same, such, for instance, as air-slaked lime, limestone, overburnt lime or ashes. To this I may say that the cement maker has just as many opportunities for adulterating his product as the lime manufacturer—and the consumer of cement seems to take care of himself pretty well. The reason is that the producer and his customers have agreed upon certain standards and tests that the cement must stand. The same can be done just as well in the lime industry. A nomenclature of the different kinds of lime together with standards defining their respective qualities should be agreed upon. In addition some practical tests should be devised for the control and identification of the product. Under such conditions it would be much easier for the contractor to order just what he wanted, and for the manufacturer to deliver what was asked for. Confidence in hydrated lime would also increase, as the consumer could satisfy himself at any time as to the quality by a comparison with the standards.

Hydrated lime is used extensively for the purification and softening of water. Hard water often contains lime and magnesia as double carbonates (CaH_2 $(CO_3)_2$, MgH_2 $(CO_3)_2$.) These are precipitated by the addition of hydrated lime. The following formulæ explain the reactions:

$$CaH_2\ (CO_3)_2 + Ca\ (OH)_2 = 2\ CaCo_3 + 2\ H_2O$$

$$MgH_2\ (CO_3)_2 + Ca(OH)_2 = MgCO_3 + CaCO_3 + 2H_2O$$

There are other uses for hydrated lime in connection with water purification, but the above example may suffice.

Only a few of the important matters in the hydrated lime business have been discussed, as the scope of this article does not allow the author to enter into any details. For instance, it was impossible to give either a full description of the different methods of hydrating or of the cost of plant and manufacture. These subjects alone would furnish enough material to fill a good sized volume.

---

*See Author's Article "Notes on the Hardening of Portland Cement," "Contract Record," June 1st, 1910.

The Government House Competition

The Royal Architectural Institute of Canada and the Ontario Association of Architects have taken a decided stand in connection with the competition for plans for the Lieutenant-Governor's residence at Toronto. When the conditions of the competition were made public they did not include the appointment of an advisor satisfactory to the Institute, who should be employed to draw up the conditions and assist in the award. This omission was brought to the attention of the promoters of the competition, but was not acted upon by them. Other objectionable features were included in the competition, not the least of these being that there was no guarantee that the winner would be given the work of supervising the building. In addition to this, the time given for preparation of the plans was insufficient. A deputation of members of the Royal Architectural Institute of Canada and of the Ontario Association of Architects visited the Ontario Minister of Public Works and laid these objections before him. The Minister stated that he would do whatever he could in connection with the matter. Subsequently the time was increased but the other objections were not removed. The Royal Architectural Association and the Ontario Association of Architects have therefore decided to advise their members to refrain from taking part in the competition.

A very large mild steel plate, the largest every produced in England, was recently rolled at the Grimesthorpe Steel Works of Messrs. Cammell, Laird & Company, Limited, Sheffield. The ingot utilized weighed 120 tons, its dimensions being 9 feet x 3 feet 10 inches x 18 feet 1 inch, and the charge was obtained from three S.M. furnaces. The ingot was stripped the following day after casting, taken from the casting pit, and within one hour charged into a horizontal re-heating furnace. The ingot was slabbed down under a 4,000-ton press to 12 feet 9 inches x 9 feet x 40 inches, reheated and rolled into a plate 18 feet x 10 feet 9 inches x 25⅛ inches, the latter operation occupying 45 minutes. When the scrap has been removed and the plate machined at Cyclops, the approximate finished weight will be 65 tons. Transit between the two works will have to be by road, three heavy traction engines being required for the purpose. Messrs. Cammell, Laird & Company are represented in Canada by F. H. Hopkins & Company, Montreal.

Vancouver, B.C., is to have a new dry dock which will cost about $1,200,000 to construct. The Dominion Government has bonused the new docks to the extent of 3½ per cent. on its capital, for 25 years. The docks will lift ships of 15,000 tons capacity. The company will also have a ship repair and construction works, and car shops which will cost about $500,000. This department is not bonused.

Road Materials and Rules for Testing Them

A Discussion of the Methods by which the Best Results are Obtained in Various Classes of Roadwork—Particulars of Some Recent Tests*

With the single exception of ordinary earth or loam, sand and clay in combination is probably the lowest type of material available for road purposes.

Without doubt loam should never be so used, with regard to economy, if anything better is obtainable at a reasonable cost. It is true that by the use of a log drag or road scraper, under the direction of trained operators, loam roads may be kept in excellent condition during the summer months, but in the spring with the frost coming out and the snow melting the condition of such roads is intolerable.

Sand, of itself, while at its best in winter and spring, does not ever have sufficient stability to sustain traffic over it, and clay, of itself, is open to the same or greater objection than loam.

It is possible, however, to combine sand with clay in such a manner that under moderate traffic and favorable climatic conditions a fairly serviceable road may be obtained. But were a gravel even of inferior quality available, a sand-clay road would not be considered seriously.

Gravel

Gravel, unlike sand, loam and clay, is not a simple material. Indeed, it is usually a mixture of materials, small pebbles or stone fragments combined with either sand or clay.

It is very widely distributed throughout the glaciated portion of the country. Prof. N. S. Shaler has stated that it rarely occurs that gravel cannot be found within an area of ten miles square in the glaciated field.

But gravel suitable for road purposes is not so plentiful as the foregoing statement would indicate, since unless the pebbles are combined with the sand or with the clay in proper proportions, the gravel, without treatment, may be of little value.

Probably the best gravel is what is called in some parts of New England, "blue gravel." This material is in effect finely broken trap rock which has been subjected to little or no water action. The fragments are angular; the graven contains little argillaceous matter and when placed on the road and rolled the fragments lock together into a mass having relatively few voids and great stability. The deposits of this blue gravel are rare and the community with a bed of such material is to be congratulated. Its road problem is not a serious one.

As between the sandy gravels and the clayey, the choice should be usually in favor of the former unless the clay is in relatively small proportion. Too much clay makes a muddy road and one which is easily rutted by traffic. Too much sand, with large pebbles makes a mass with little or no stability and no amount of rolling will compact it.

For the best results, in general, considering the ordinary gravels, the writer believes that all stones which will not pass through a two and one-half inch mesh should be screened out; that at least 50 per cent. by weight should consist of pebbles or fragments which will not pass through a one and one-quarter inch mesh; at least 80 per cent. should not pass through a one-half inch mesh; and that the remainder should consist of small fragments of pebbles and sand from less than one-half of an inch in diameter to an impalpable powder.

The writer admits that such a gravel is too rarely found but he offers it as an ideal to be approached as nearly as is possible, always bearing in mind the economics of the problem.

A gravel so graded, when properly rolled, has great stability in the road. If the pebbles in the gravels are from rocks of a crystalline or eruptive nature, as is usually the case in New England, a road built of such material will make but little mud under traffic and should not rut to any considerable extent even when the frost is coming out of the ground.

Rocks

In general, the chief desiderata in rocks for road building are hardness and toughness, and the writer believes that toughness should be written first. It is wholly within the range of possibility that in the most modern types of road surfaces, considered economical for the kind of roads herein contemplated, namely, those in which some form of bitumen is used as a binder or matrix, or as a wearing coat, stones of somewhat inferior quality may be used safely.

If the road builder has a choice between stones for macadam purposes, and too often he has not, no scientific instruments of precision are usually required to determine the relative value of the stones. The stone hammer and the scratching of one stone with the other are all that are necessary. And it may also be generally stated that the rocks having a fine texture are more likely to be tough than those having coarse crystals. When there is not an excess of motor vehicles in the locality, a smooth surfaced road will be more often secured if ledge rock is used rather than field boulders. The field stones are usually of glacial origin. The fact that they escaped utter demolition in the cataclysmic grindings of the glacial period indicated that they were of the toughest and hardest parts of the rocks from which they were separated. But while they may be harder and tougher than the ledge rock in the locality, because of lack of uniformity in these characteristics, comparing boulder with boulder, the road surface in which they are placed is likely to wear less smoothly than if ledge rock is used.

Under very light traffic or when motor vehicles predominate, the writer believes that a relatively soft rock will often prove to be more economical than a relatively hard one; also that under such conditions when a good gravel is obtainable, its use will usually prove to be more economical than if the road is built after the macadam type.

Much has been said and written about the cementing power of the fine dust or powder which results from the crushing of stone by machinery. The writer believes that certain stones, notably the limestones, undoubtedly produce screenings of value in this respect. But while most of the other stones make a dust almost wholly lacking in this property, such screening when properly applied serve well as a binder. It would seem that the action is more mechanical than chemical. The fact that sand, if the particles are angular and not rounded, is often used satisfactorily as a binder would seem to prove this hypothesis.

Of the most common stones used for macadam work, it has come to be generally accepted that trap rock (diabases, diorites and some other rocks of an igneous metamorphosis) is the best. In the order of merit there follows the felsites, hornblendic, granites, the harder limestones, schists and quartzites. It is not safe, however, without investigation and tests to say for instance that a granite is always better than a limestone, since some of the non-crystalline limestones are often found to be far superior to the large crystallized granites. This may also be found to be true when other rocks of the foregoing list are compared with one another.

---

*A paper read at the American Congress of Road Builders at Seattle by Austin B. Fletcher, secretary Massachusetts Highway Commission.

Undoubtedly, the best laboratory tests of rocks for road building are those made by the Office of Public Roads at Washington, D.C.

That department undertakes to make tests and analyses of stones without charge. It has done much excellent work and tests and reports on tests are made with admirable promptness. The nature of the tests as made by the Office of Public Roads will not be discussed here. They include everything hereinbefore referred to concerning tests of rocks and much more, and they have been completely described in the bulletins of that department.

Bituminous Materials

The writer pauses before entering upon the discussion of the tests of bituminous materials which may be used in road work. While there is no doubt that this material is the most interesting that has so far entered into the construction of road surfaces, it is so new that no standards have been fixed.

The necessity for the use of such materials on our rural roads is wholly due to the rapid change in traffic conditions from horse drawn to self-propelled vehicles. Nor is it known precisely why motor vehicles require so different a kind of road surface. Much has been said and written, and the writer of this paper acknowledges his own errors in that particular about the suction caused by the tires of such vehicles. While suction may play some part in the erosion of road surfaces, it is coming to be recognized that the principal source of difficulty lies in the disintegrating action of the rear wheels of motor vehicles. The tractive power being applied through the rear wheels results in a tangential stress upon the surface instead of a pressure normal to the surface, as in the case of the horse-drawn vehicle.

Until comparatively recently it has not been necessary to provide against any such tangential stress, but no macadam road which will receive much motor vehicle traffic could now be planned without taking it into consideration.

Thus far bituminous materials, only, seem to offer a remedy for the difficulty at a cost which is reasonable, and the coal tars, asphaltic oils, and asphalts are the materials to which road builders have turned their attention in their search for a binder for the broken stone.

The writer is aware that the title of this paper mentions particularly simple tests. There is no such thing as a simple test of bituminous materials. There is no branch of chemistry which gives the chemist more trouble than the analyzing of materials containing bitumens.

It is true that the coal tars have been used for many years here and abroad for sidewalk purposes and to some extent in roadways, and that some of the men who have handled the materials have become more or less expert in their use. Indeed, some of these men claim to be able to judge of the quality of a tar when heated by watching it drip off the end of a stick or by chewing it. But these tests are rather too crude for the engineer and the expert chewer cannot describe his sensations accurately enough for insertion in specifications. The results secured in the use of tar also indicate that these empiric methods are too crude, since while some of the work done has been excellent, other tar constructions have disintegrated rapidly.

All this leads the writer to the belief that the chemist must, in a large measure, work out this new problem for the road builder.

The coal tars have been used sufficiently in the past in road making to indicate that to be of substantial benefit they must be partially refined and possibly combined with other materials. Unless they are treated so that all the water, the naphthas, some of the light oils and the ammoniacal liquors, are removed, they will prove of little value. But just what the permissible specific gravity and percentage of free carbon, and what the viscosity and other characteristics should be, are questions of greater difficulty.

The chemists, acting with the engineers, are working diligently on these questions, and it is hoped that by their combined efforts the essential characteristics will be standardized.

The asphaltic oils likewise promise to be useful as binders for macadam and gravel roads, but even less is known of them than of the tars. It seems to be reasonably safe to say that they should be free from water, and that no oil which has a base of paraffin should be used. The value of the oil should depend on the amount of bitumen contained in it. Oils having a relatively low percentage of bitumen are useful for surface application to alleviate the dust nuisance, but for use as a binder in gravel or macadam work it now seems that those oils which have the greatest percentage of bitumen will prove most economical.

It is an open question whether the best asphaltic oil is such as is made up synthetically by thinning down asphalts with lighter oils or fluxing oils, or whether the best oil is secured by stopping the refining process at just the right point and before the refining is carried to the hard asphalt stage. It would appear that the first process should give a product more uniform than the latter, but which process is the better is not yet determined.

The asphalts which are being experimented with as binders are mostly of those made from asphaltic oils. No one knows whether they will prove more economical for use than the so-called natural asphalts such as the Trinidad or the Bermudez. Lacking the test of time, the oil asphalts appear to be cheaper.

The following specifications will give some idea of the complexity of the artificial binders here under discussion. They are such as have been prepared for the Massachusetts Highway Commission by Mr. H. W. Clark, chief chemist of the Massachusetts State Board of Health, and represent the results of a considerable study of the materials in the laboratory and in the roads. It is not claimed that they are in perfect form but the commission is using materials conforming to them this year in its treatment of many miles of road. The specifications are intended to represent what have been so far offered as the best materials for bituminous road binders:

Refined Tar

Sec. 10a—The tar must be uniform in color, character, appearance and viscosity and must have the following qualities:

a—It shall contain not more than 0.5 per cent. of mineral matter or dirt.

b—It shall have a specific gravity between 1.18 and 1.25.

c—It shall not contain more than 14 per cent. by weight of free carbon.

d—It shall contain no body that distills at a lower temperature than 25 deg. C.; not over ten per cent. by weight shall distill below 270 deg. C. and it shall contain at least 65 per cent. by weight of pitch and bituminous material remaining after all bodies up to 360 deg. C. have been distilled.

e—When 20 grams are heated in a flat-bottom dish 3 inches in diameter for 21 hours in an oven kept at a temperature of 100 deg. C. the loss shall be not more than 10 per cent. by weight.

f—It shall be of such viscosity that 60 c.c. measured at room temperature (78 deg. F. or 26 deg. C.) shall, when at 100 deg. C., be not less than 85 seconds and not more than 240 seconds in passing through a viscosimeter orifice 5-64 of an inch in diameter when acting under a head of 4¼ inches.

g—When 12½ per cent. by weight of the material is mixed with 87½ per cent. by weight of sand, of such grade that all will pass through a sieve having 10 meshes to the linear inch and practically none through a sieve having 100 meshes to the lineal inch, and briquettes made 3 inches square and ½-inch thick, such briquettes will so harden in seven days at ordinary room temperature that when laid flat and held by their edges by two parallel knife-edge bars, they shall not bend when a weight is suspended from a third knife-edge or parallel bar placed across their centre until this weight reaches 200 grams, and shall not break at less than 250 grams, and the weight causing bending shall not be greater than 80 per cent. of the weight causing breaking.

Asphaltic Oil

Sec. 10b—The oil submitted shall be of a uniform color, appearance, general character and viscosity, must contain no bodies not naturally present in an asphaltic oil and must fulfill the following requirements:

1. It shall not contain more than 0.5 per cent. of dirt or adventitious mineral matter.
2. It shall have a specific gravity of at least 0.97.
3. It shall not contain more than 1 per cent. of matter insoluble in carbon bisulphide and should not contain more than 10.0 per cent. insoluble in petroleum ether.
4. It shall contain no body that distills at a lower temperature than 250 deg. C. and shall not lose more than 55 per cent. by weight by distillation to 360 deg. C.
5. It shall be of such viscosity that 60 c.c. measured at room temperature (78 deg. F. or 26 deg. C.) shall when at 100 deg. C. be not less than 5 minutes nor more than 10 minutes in passing through a viscosimeter orifice 5-64 of an inch in diameter when acting under a head of 4½ inches.
6. When 20 grams are heated in a flat-bottom dish 3 inches in diameter for 21 hours in an oven kept at a temperature of 100 deg. C. it shall not lose more than 5 per cent. by weight.
7. When 12½ per cent. by weight of material is mixed with 87½ per cent. by weight of sand and briquettes made 3 inches square and ½-inch thick, these briquettes must keep their shape and show some binding together.

Oil Asphalt

Sec. 10c—1. The asphalt submitted shall be of uniform color, appearance and character, and shall contain no body not naturally present in an oil asphalt.

2. It shall not contain more than 1 per cent. of dirt or adventitious mineral matter.
3. It shall have a specific gravity between 1.00 and 1.10.
4. It shall not contain more than 1 per cent. of matter insoluble in carbon bisulphide and should not contain more than 30 per cent. insoluble in petroleum ether.
5. It shall contain no body that would distill at a lower temperature than 225 deg. C. and should not lose more than 40 per cent. by weight by distilling to 360 deg. C.
6. When 20 grams are heated in a flat-bottom dish 3 inches in diameter for 21 hours in an oven kept at a temperature of 160 deg. C. the weight shall remain practically constant.

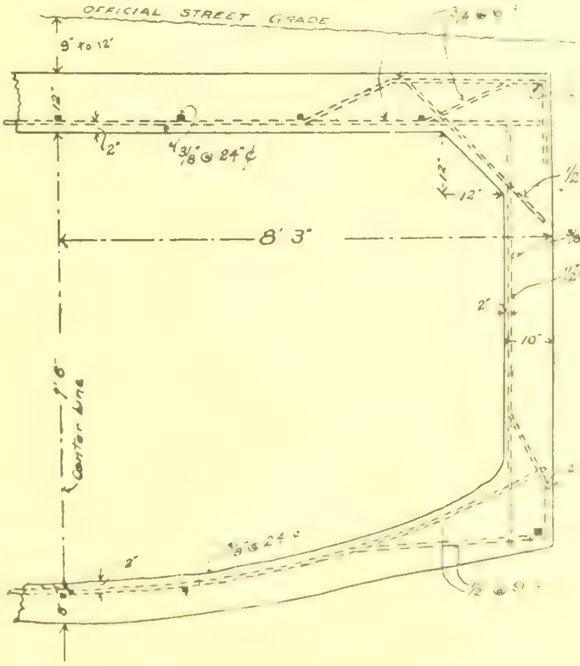
Concrete Hollow Blocks

The "Engineering Record" comments in part as follows on the standard rules and regulations governing block making as adopted by the National Association of Cement Users:

"Concrete hollow blocks like a number of other concrete and reinforced concrete products, have come to stay, and have already found a wide and rapidly widening application in building construction and in some other lines of work. They constitute a useful and attractive building material in consequence of the ease with which they can be made of any shape, and because they may be conveniently and economically laid. Their utilization constitutes, so far as modes of manufacture and procedure in building are concerned, practically an extension of the use of bricks. Further than this, they possess an advantage over the latter in ease of manufacture and especially in the ease with which void spaces may be formed in the concrete, thus making, what is frequently much desired, an air space in the wall. At the same time they have one other characteristic, porosity, in which they are unfortunately too much like brick. Any process of manufacture or simple, economic treatment which will eliminate the porosity of the hollow concrete block will add much to its value. Again, inasmuch as the hollow blocks are bound to be used where more or less heavy loads will come upon them, it is of the utmost importance to be assured that they have the requisite carrying capacity, not only at the time of laying them, but also at a subsequent period when they receive their greatest loadings. While the operations of hollow concrete block making constitute practically shop work and they may consequently be controlled with corresponding ease and accuracy, it is imperative that these concrete shop operations, so to speak, should be subject to just as stringent specifications as those which belong to the fabrication of steel structural members, also a shop operation. This is all the more necessary from the fact that the manufacture of concrete hollow blocks is essentially a new industry."

Reinforced Concrete Brick

Several structures which we have inspected recently have called to our attention the importance of paying more attention to the angles and corners of concrete structures than is frequently done, says the "Municipal Journal and Engineer." This is especially the case where there is a change in the thickness, form or conditions to which the two parts of the structure which meet at such an angle are subjects. An angle of 90 degrees or less is an invitation for a crack to begin at that point, whereas a round surface will frequently prevent a crack from spreading. An illustration of the last statement is found in the fact that a crack in an iron or steel plate may sometimes be stopped from extending further by drilling a round hole at or just beyond the extreme limit of the crack.



The above would suggest that junctions between the side walls of tanks, reservoirs, etc., and between the sides and either top or bottom of a sewer or conduit should be made with rounded rather than with square corners; also that additional reinforcement be placed at such intersections to resist any tendency to cracking apart. An illustration of both of these is found in a recent design for a sewer or creek conduit to be constructed at Vasalia, Cal., made by Mr. M. L. Weaver, the city engineer. The section shown here, which will be about 860 feet long, is intended to carry the street traffic with a cover of only 9 to 12 inches above the roof. The most of the conduit, however, will be off the highway and in this section the construction will be lighter. In this plan it is seen that the top intersection is made with two 120 deg. angles rather than one 90 deg. In our opinion a quadrant of a circle would be still better than this.

Railways to Become Large Builders in Concrete

Officials of railways, who have in their charge the construction and maintenance of buildings, bridges, roadbed and other equipment, proceed with extreme care in the selection of materials and methods for handling them.

Concrete has already come to play an important part in railroad building and as yet only a start, as indicated by the committee reports submitted to the recent maintenance of way convention, held in Chicago. Concrete bridges, coaling stations and fence posts seem to be considered successful. The following paragraphs are taken from the reports of committees that have been investigating the different classes of construction mentioned:

In any bridge the qualities to be desired are: (1) adequate strength; (2) freedom from vibration and excessive deflection; (3) economy in first cost; (4) economy in maintenance, and (5) permanence.

The theory of flexure of reinforced concrete is sufficiently well understood to enable safe and economical designs to be made, and experience with reinforced concrete structures carrying dead loads only has been abundant. Experience with such structures carrying heavy live loads and subjected to the shock and vibration of these loads, moving at high speed, has not been so extensive, but reinforced concrete girders can be designed and built in short spans of any strength required (or likely to be required) by railway loads. In the event of overloading or defective construction, reinforced concrete will give quite as much warning of probable failure as other materials.

While the art of bridge construction in steel has so far progressed that the safeguards surrounding the manufacture of steel and its fabrication into bridges have come to be matters of course, the equally careful supervision of the manufacture of reinforced concrete seems burdensome to the engineer, although it is just as necessary as in steel, but no more so. This necessity for careful inspection of methods and materials of manufacture needs to be emphasized, for (like steel) concrete may most easily be ruined by careless workmen. But when the same pains are taken to produce good concrete as are now taken to produce good steel, with the same rigid inspection and insistence on proper specification, there will result a product which we believe will prove to be equally reliable.

Advantages of Reinforced Concrete

One of the chief advantages of reinforced concrete over steel for short spans is that the form lends itself more readily to ballasted floor construction, the superiority of which over open decks is evident, not only on account of the absence of wood, which may rot or burn, or exposed steel, which requires protection from brine drippings or other corrosive influences, but also on account of the freedom from vibration and excessive deflection, and the reduction of the cost of maintenance to a minimum.

The comparative economy of the two styles of construction is a matter which is not easily determined in general terms, depending as it does upon the market price of steel, concrete materials and labor. The character of the design is also a factor of first importance. Generally speaking, if it is not considered advisable to use ballasted floors in any particular case, for that case, the short span of I-beams with ordinary floor of wooden ties is the cheaper construction in first cost. If, however, a large number of similar spans is to be built, so that concrete slabs can be constructed in a central and conveniently arranged plant, and if the erected price of steel work approximates 3 cents per pound, the difference between concrete slab construction built with ballast floor and steel construction with open wooded floor, will be small, and in many cases will be favorable to the concrete.

If the designs contemplate the use of I-beams embedded in concrete, compared with reinforced concrete girders, economy will be all on the side of the latter.

Short spans of reinforced concrete also permit a substantial economy in the design of abutments carrying them.

Reinforced concrete flat slabs or girders are not generally advisable for railway loads in spans exceeding 40 feet. But as the great majority of structures carrying tracks over openings in the roadway are of spans less than 40 feet, the importance of these small structures is very great, and the use of reinforced concrete for these small spans is desirable.

Concrete Fence Posts

While American railways have been conducting extensive experiments to demonstrate the economy of the reinforced concrete post, the art is still in a primitive state. Distinct progress, however, is being made, and another year should produce much valuable information. The following facts have been established and are self-evident propositions:

(1) Concrete fence posts will heave very little and in most cases not at all; posts set from two to five years ago are still in almost perfect alignment.

(2) They appear sufficiently strong for all practical purposes after having been properly cured and set. A cedar post of dimensions identical with the average concrete post would weigh about 25 per cent. as much and is about four times as strong when new. But this only brings out the fact that the cedar post is stronger than necessary and that the concrete post with its lesser strength is yet strong enough to serve it purpose, and has a longer life.

(3) The claim that a concrete post reinforied with steel forms a lightning protector appears reasonable.

(4) They resist the action of fire and decay, and will not float and cannot be displaced as easily as wood.

(5) They must be handled carefully in loading and unloading, and be well cured before being set.

(6) They are much heavier than wood posts and the cost of distributing and setting is about 25 per cent. greater.

It is reasonable to assume that, since concrete has supplanted wood and steel for a great variety of purposes, it will also do likewise in the case of fence posts. It remains only to produce a really practical post from the viewpoints of economy and utility to bring them into general use. They will naturally have to be made by machinery. There are already a number of cheap portable machines on the market.

Reinforced Concrete Coaling Stations

The cost of reinforced concrete coaling stations averages about 50 per cent. greater than that of timber structures of like capacity.

It would seem that the use of the reinforced concrete type of coaling stations and storage bins is increasing. In many cases, no doubt, the freedom of this type from the danger of the loss of the structure and contents by fire due to spontaneous combustion of soft coal will cause many engineers to install one or more of these structures so that they may have a practical test of their efficiency.—"Concrete."

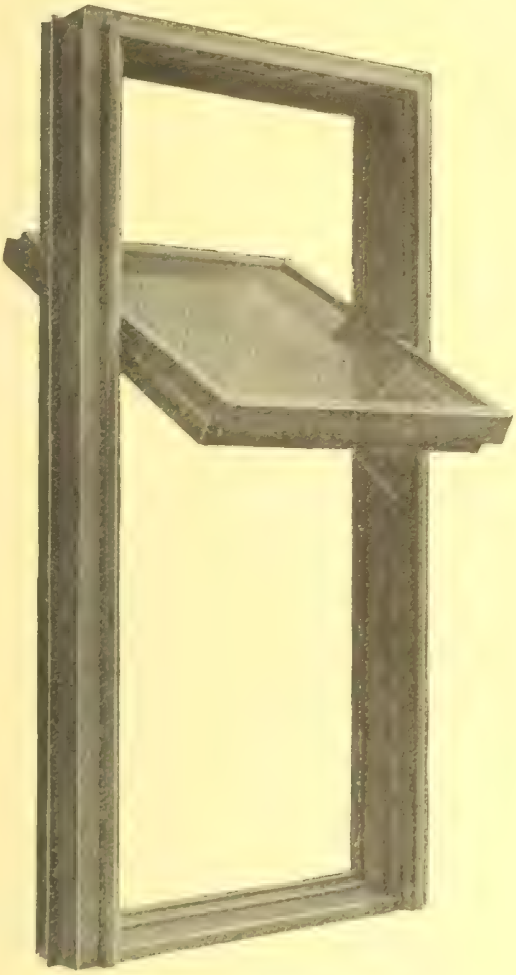
The architectural firm of Michie & Dowler, Calgary, Alta., has been dissolved, and Mr. Dowler has engaged in partnership with Mr. G. M. Lang, C.E. The new firm will be known as Lang & Dowler, with offices in suite 6, Alexander corner, over Molsons Bank, Vancouver, B.C. Mr. Lang is an associated member of the Canadian Society of Civil Engineers, and was for several years in the engineering department of the C.P.R. Mr. Dowler is a registered member of the Alberta Association of Architects, and together with his former business associate, has been connected with the erection of a large number of the more important business buildings in Calgary.

Reasons why

you should specify

DOUGLAS BROS.

FIREPROOF WINDOWS



View of Double Hung Window

- Easy to handle.
- Mechanically perfect in construction.
- Rigid and easily glazed.
- Simply made and easily adjusted.
- Made in a model factory by special machinery and skilled workmen.
- And always delivered on time.
- Other reasons will be found in our catalogue.

SEND FOR A COPY

Douglas Bros., Limited

TORONTO, Ont. MONTREAL, Que.

Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

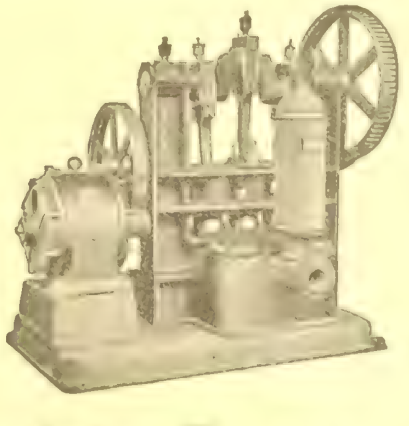
We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, Montreal
Phone Main [illegible]
Works: Seneca Falls, N.Y.

Ottawa's New Building By-law

The new building by-law of the city of Ottawa contains over 100 pages. It does not cover the plumbing or electrical fittings, which will come under separate by-laws.

At first it was proposed to limit the height of buildings in this city to eight storeys, but at the council meeting at which the by-law adopted this clause was cut out. However, the by-law does not make any provision for the thickness of walls over eight storeys, and this table will have to be added. All dwellings of over 80 feet in height must be fireproof. No frame building can be erected over three storeys high. Dwellings on inside lots must not cover more than 75 per cent. of the area of the lot. A back yard 10 feet wide for a dwelling 25 feet high and widening 3 inches per every additional foot, must be provided. If there is an alley at the back, half the width of this may be included as back yard. In case there is a side yard the entire length of the lot, the back yard need only be five feet. In case of a corner lot, the dwelling may cover 90 per cent. of the lot. All ceilings in dwellings must be at least 8 feet high and every room must have at least one window opening onto outside air. The aggregate of the window area for each room must be equal to 10 per cent. of the floor area. Attics, of course, are excepted from this regulation. Business buildings may cover the entire lot, but if upper storeys are used as dwellings, they must be reduced in size to comply with the clauses respecting dwellings. Enclosed courts must have horizontal intakes at the bottom whose area must be equal to 10 per cent. of the area of the court.

Particular specifications are made with the view to making foundations secure, such as that all buildings up to 40 feet in height must have foundations of at least 13 inches in thickness for concrete and 18 inches if of stone. The permissible load per square foot to which different kinds of soil under the foundation walls and piers of buildings may be subjected is as follows:

Gravel and coarse sand, well cement,..	8 tons per square foot
Dry hard clay	4 tons per square foot
Sand, compact and well cemented	4 tons per square foot
Moderate dry clay or clean sand	2 tons per square foot
Soft, wet clay	1 ton per square foot
Quick sand or alluvial soils	½ ton per square foot

The width of all footings and ranging timbers shall be at least sufficient to meet these requirements.

The load per square foot placed upon walls, piers or other supports of masonry constructed of first class materials of the several kinds mentioned, shall never exceed the limit given in the following table:

	Safe load per sq. ft.
Gravel and coarse sand, well cemented..	8 tons per square foot
Ordinary brick laid in Portland cement mortar	5 tons
Hard brick laid in lime mortar	6 tons
Hard brick laid in Portland cement and lime mortar	9 tons
Hard brick laid in Portland cement mortar	12 tons
Pressed brick laid in lime mortar	8 tons
Pressed brick laid in Portland cement mortar.......	14 tons
Rubble stonework in lime mortar	4 tons
Rubble stonework in lime and cement mortar	6 tons
Rubble stonework in Portland cement mortar	8 tons
Concrete, one part cement, two parts sand and five stone	15 tons

Water tanks erected over roofs of buildings are to be supported on sufficient brick bearing walls or beams, and pillars of metal, and so constructed as to protect the bearing walls and walls of building from water.

Before getting permits for a reinforced concrete structure, specifications, giving the composition of the concrete, must be filed.

All stone or lime offered for sale, if required, must be weighed on the city scales. Each vehicle for delivering materials must be numbered and its capacity stamped on it.

No projection will be allowed from a building over the sidewalk at less than 10 feet above the walk, and (except in the case of main cornices) none may project more than two feet. Main cornices are limited to four feet. All canopies or hoods over the sidewalk must be supported entirely from the building.

All public buildings or places of amusement with a capacity of over 1,200 persons, must be fireproof. Smaller theatres, etc., must be of slow burning material. There must be emergency exits on each side of the auditorium whose area will aggregate half the area of the main entrance. None shall be less in width than 3 feet 6 inches. These exits must have two doors which open outwards. Main stairways and doors must aggregate in width 18 inches for each 100 persons' capacity.

Canadian City Engineers

A. J. Latornell, Edmonton, Alta.

Mr. A. J. Latornell, who was recently appointed city engineer of Edmonton, is of French Hugenot descent but is a Canadian by birth, having been born at Meaford, Ont. After acquiring all the education to be obtained at the public and high school of his native town, Mr. Latornell began his engineering training in the autumn of 1898 by entering the chops of the W. A. Johnson Electric Company, of Toronto, as special apprentice. After serving in these shops and those of the United Electric Company of Toronto, he entered the School of Practical Science in October, 1900, from which he graduated in May, 1903, with honors in the Department of Civil Engineering. His vacations during this period were spent in survey work in the West.

A. J. Latornell, City Engineer of Edmonton, Alta.

In May, 1903, he entered the services of the Canadian Pacific Railway as assistant to the resident engineer on Maintenance of Way at Ottawa, Ont. Resigning from this company in June, 1904, he made connections with the Public Works Department of the Northwest Territories, in whose employ he continued until October, 1905, when he returned to the University of Toronto to take the post graduate work in civil engineering. In May, 1906, he graduated from this University with the degree of Bachelor of Applied Science.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."
—The Philosopher of Metal Town.

"METALLIC"
Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

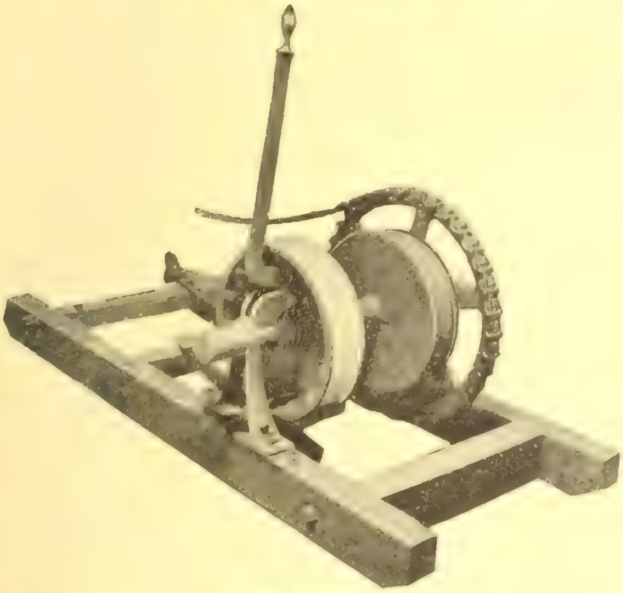
Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work
Bridge Building
Mortar Conveying
Sewer Building
Well Digging
Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

After graduating, he was employed by the Iroquois Construction Company of Lockport, N.Y., being engaged on transmission line work for the Ontario Power Company. In July of the same year he resigned to enter the service of the city of Edmonton. There he was employed first as instrument man on construction work and later as assistant city engineer. In May, 1908, when Mr. Keely, the former city engineer, left, Mr. Latornell was appointed acting city engineer. In December of the same year he was offered the position of city engineer but declined the appointment owing to certain unsatisfactory conditions. His services as acting city engineer were retained, however, and in February of the present year he was again offered, and accepted, the post of city engineer.

The city of Edmonton owns and operates all its own utilities, and as these have had their greater development during the period of Mr. Latornell's connection with the engineering department, he has had unusual opportunity to become familiar with all the details of the city's work. Mr. Latornell's somewhat rapid promotion at Edmonton has been due, we venture to think, not so much to the excellent opportunities he has had, as to his own good ability and to his capacity for hard work.

Personal News and Notes

The National Good Roads Congress is now in session at Niagara Falls, N.Y. The dates of the convention are July 28-30.

Mr. A. E. Potter, consulting engineer, of New York, has submitted a report and plans for the proposed sewerage system at Strathcona, Alta.

In our last issue we reported the resignation of City Engineer Cameron of North Vancouver. The latest word from this municipality is that the entire engineering staff has gone out.

Mr. Ross Malcolm, a son of Mr. Thomas Malcolm, contractor for the International Railway in New Brunswick, was seriously injured last week in an automobile accident at Campbellton, N.B.

Mr. George Wright, formerly assistant city engineer of London, Ont., has been appointed city engineer, vice A. O. Graydon, resigned. Mr. Graydon is being retained as consulting engineer and building inspector.

Mr. T. Martin, assistant engineer of the C.P.R. at Calgary, Alta., has been appointed division engineer of the new Saskatchewan division, with headquarters at Moose Jaw, Sask. Mr. H. B. Sims, resident engineer at Moose Jaw, has been appointed assistant division engineer.

The sixth annual convention of the Northwest Plumbers' Association was held recently at Vancouver. Delegates were in attendance during the whole week commencing July 11th. Representatives were present from Butte, Mont., and other distant points. The proceedings were directed by the president, Mr. A. L. Williamson, of Portland.

It is authoritatively announced that the C.P.R. will begin construction very shortly of the Arrowhead and Kootenay Railway pushing the work forward to completion as rapidly as possible. Construction will proceed simultaneously from Arrowhead and from Gerrard and the road will probably follow the north shore of Trout lake to Trout lake city.

The annual convention of the Master House Painters' Association of Canada is now being held at Ottawa. The opening session was on July 26th. The closing day is July 28th. Representatives are in attendance from as far west as Edmonton and as far east as St. John, N.B. Addresses are being given by John Dewar, of Pittsburg; E. J. Linnington, of Hamilton; Mr. Frank, of New York; Mr. Fred Trelford, of Niagara Falls, Ont.; Mr. John Giorloff, of Ottawa, and Prof. Gardner, of Philadelphia.

The Dominion Safe & Vault Works are opening up a foundry at Farnham, Que., where they have secured the C.P.R. shops. Besides this new industry, a building is being erected as a sash and door factory for Messrs. M. Boucher & Company, formerly of St. Francois du Lac. Their building is well under way and will be completed in a couple of months. This firm has the contract for a new steel bridge at Magenta.

Mr. John B. McRae, consulting engineer, and his assistant, Mr. A. H. Dion, both of Ottawa, left that city last week for Moose Jaw, Sask., where they will supervise the building of the new street railway now under construction. The franchise for the new road was secured by a number of Ottawa men headed by Mr. A. A. Dion of the Ottawa Electric Company, and Mr. Newton J. Ker, city engineer, and extends for 20 years. Moose Jaw now has a population of about 18,000 and is growing rapidly. The road will extend for six miles and it is intended to have three miles in operation this fall.

The big water tower to supply the Edmonds section of Burnaby, B.C., is nearing completion. It is situated opposite to the power house and it will have a capacity of 1,500 gallons. It is 75 feet in height and is constructed of wood and cement piers with tank of wooden staves. The base is 40 feet square. Water is being supplied by the B. C. Electric Railway Company at their own expense by pumping from their artesian well, which has a capacity of $42,000 gallons a day. It is expected that completion will be effected early in August. The pipes will stand a pressure of 250 pounds to the square inch. This is part of the Burnaby waterworks system.

The Ratepayers' Lament

They took a little gravel, and they took a little tar,
With various ingredients imported from afar.
They hammered it and rolled it, and when they went away,
They said they had a pavement that would last for many a day.
But they came with picks and smote it, to lay a water main;
And in time they called the workmen to put it back again.
To run a railway cable they took it up once more;
And, later, put it back again, just where it was before.
They took it up for conduits to run the telephone;
And then they put it back again, as hard as any stone.
They took it up for wires to feed the 'lectric light,
And then they put it back again, which was no more than right.
Oh, the pavement's full of furrows: there are patches everywhere;
You'd like to ride upon it, but it's seldom that you dare.
It's a very handsome pavement, a credit to the town;
They're always digging of it up, or putting of it down.

Foreman "Falls," Too

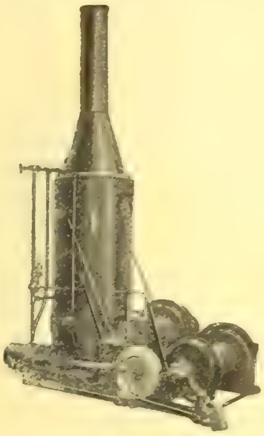
He was a twentieth century hustling builder, and under his auspices cottages and buildings seemed to spring up like mushrooms.

"Please, sir," said one of his foremen, rushing up to him one morning in a state of mental collapse, "one of the new houses has fallen down in the night."

"What?" he roared, "you mean to say that one of my well-built, desirable residential houses has come to grief? Ah, I suppose you took the scaffolding down before you put on the wall paper?"

"Yes, sir."

"Well, what can you expect, you rank outsider? Call yourself a foreman? Get off the works. You're fired."



The Best HOIST in Canada

Note Well the Exclusive Features

The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Offices:
Nos. 346 and 348 Broadway, NEW YORK CITY U.S A

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S ; Hamilton, Ont. London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N B ; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS C IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis,

(Taylor & Gordon)

Architects

North British & Mercantile Chambers,
80 St. Francois Xavier St., Montreal
Telephone Main 281.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Phone Main 685 686

The

Roofers Supply Co.

Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and
Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and
Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime.

FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

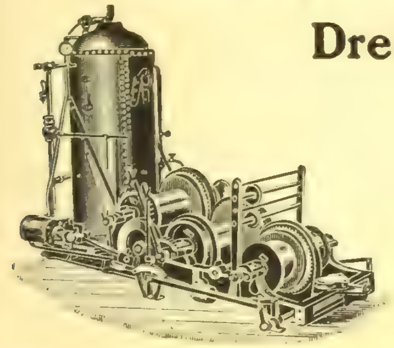
Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

M. Beatty & Sons, Limited

Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 **TORONTO**
Branches: Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer
Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**
Office Phone P. 64 Residence P[illegible]

Steel and Wood TANKS

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and
Rounds
3-8 in. to
1 1-4 in.

Elastic Limit
50,000 lbs.
or Higher

HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate
Shipment
from
Stock

Cut to
Required
Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. *Suburb of Buffalo, N.Y.

Toronto Office
117 Home Life Building

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

You Can Safely Recommend and Specify

ELASTICA FINISHES

and rest assured of their Uniformity, Durability and Excellence

Look out for your reputation and your business will take care of itself. Elastica Finishes are intended for the finest and exclusive work in residences, office buildings, banks, hotels, etc., where only the best is good enough and cost a secondry consideration.

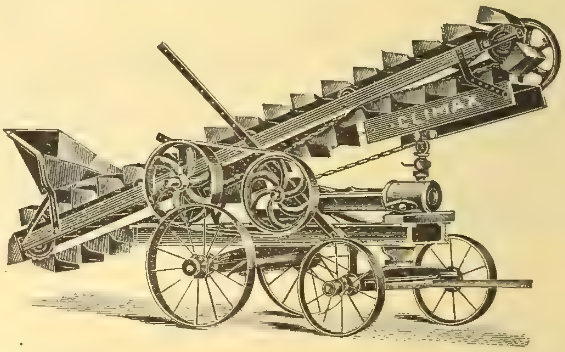
ELASTICA FINISHES were the first varnishes introduced to and specified by architects on this continent and the increasing number of prominent architects and contractors, in both Canada and the United States, who are specifying and endorsing these finishes, furnish unmistakeable proofs of their high and unvarying excellence.

Write for our nickel steel bond book of Architectural Finishes and stains. It contains facts you ought to know and is mailed free.

Sold in Imperial Measure Cans only

INTERNATIONAL VARNISH CO.
Limited
Toronto Winnipeg
2510

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER-

All sizes ready for shipment.

Catalogues furnished on application.

The
Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

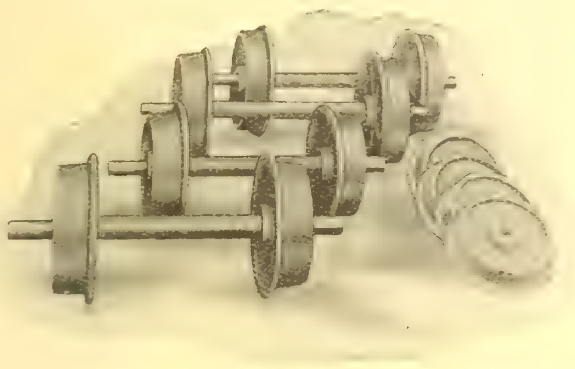
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N.S.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

ROCALITE

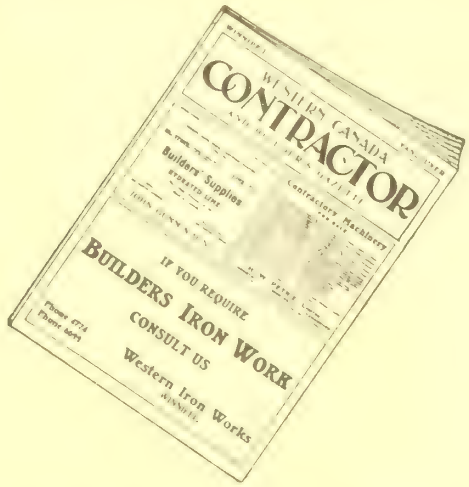
The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



Winnipeg
Western Canada
CONTRACTOR
and Builders' Gazette
Builders' Supplies
Contractors' Machinery
If you require
Builders Iron Work
consult us
Western Iron Works
Winnipeg
Phone 6774
Phone 6691

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridges' Bay, TORONTO**

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U.S. Letters Patent.

Toronto Canada

WE HAVE THE STOCK

Ready for prompt shipment

FIRE CLAY
FIRE BRICK

CEMENT
CRUSHED STONE

BUILDING STONE
BUILDING SAND

GRAVEL, SCREENED, PIT RUN AND PEA GRAVEL

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664 665 Evenings, North 2107 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**
London, Canada Limited

Toronto Office: 103 Pacific Bldg.

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited

9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

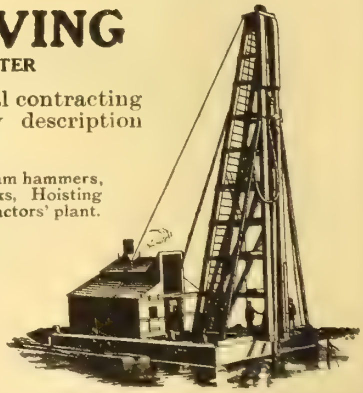
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



Harry Allen Jacobs,
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving strains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS {
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Summer Contracts

Architects and contractors who are desirous of making or of keeping a good reputation will act in their own interests by specifying

Port Credit Brick

We have recently made extensive enlargements and improvements to our plant and have now one of the finest equipments in America.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Sand & Supplies
LIMITED
Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite
Crushed Stone and
Sewer Pipe

M. 4507

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
——HEAD OFFICE:——
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA aud H. S. FERGUSON
ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

**MECHANICAL and
HYDRAULIC ENGINEER**

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

**Charles H. Mitchell
Percival H. Mitchell**

**Consulting and Supervising
Engineers**

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG
Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

The John Galt Engineering Co.

**CONSULTING CIVIL AND
SANITARY ENGINEERS**

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The
KATIE
**Foundry,
Galt, Ont.**

Municipal
Water Pipe,
Service Boxes,
Manhole
Frames,
Crossing
Plates,
Special
Castings.

Western Lumberman

Representing the Lumbering and Woodworking interests of
British Columbia Alberta Saskatchewan and Manitoba

Winnipeg, Manitoba

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

**VACUUM STEAM HEATING
and DRYING SYSTEMS**

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.
67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited

MANUFACTURERS OF
**Building Granite, Granite
Setts, Curbing, Etc.**

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

		Star.	D,D.
10 to 25	united inches	$4.25	$ 6,25
26 to 40	"	4.65	6.75
41 to 50	"	5.10	7.50
51 to 60	"	5.35	8.50
61 to 70	"	5.75	9.75
71 to 80	"	6.25	11.00
81 to 85	"	7.00	12.50
86 to 90	"	....	15.00
91 to 95	"	....	17,50
Brass Goods, Valves, etc.			
96 to 100	"	....	20.50
101 to 105	"	....	24.00
106 to 110	"	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 55 cents per square foot up.

Floor Tile—½-inch square 65 cents.

Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, firsts 70 cents.

Capping Coves and corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 8 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 8 inches, 80 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers Galvanized Iron Range.

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b, Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto,

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3,50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents,

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $9.00; sanded, $5.00; hydrated lime, $10.00; bags extra.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,

Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.

Turpentine, in barrels, 89 cents per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Vanier & Vigeant, plumbers, Montreal, Que., are stated to have dissolved.

E. Sauriol & Company, contractors, Montreal, Que., are stated to have dissolved.

Buffalo Wire Works Company, St. Paul, Que., are stated to have sold their assets.

Stanton & Lawson, contractors, Fort William, Ont., are stated to have assigned.

Toussaint, Glibert & Paye, contractors, Montreal, Que., are stated to have dissolved.

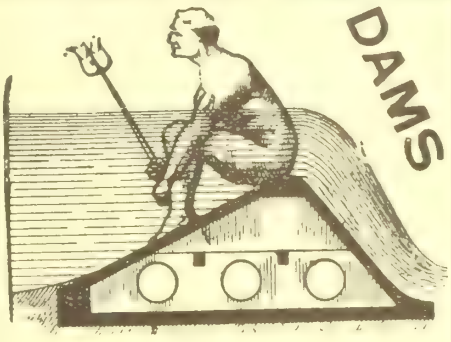
Gilbert, Gustave & Guillaume Paye, general contractors, Montreal, Que., have registered.

C. J. O. Couture & Frere, lumber merchants, [illegible] Que., are stated to have assigned.

Hamilton Mill Stock & Metal Company, Hamilton, Ont. are stated to have assigned to J. T. Middleton.

Electric Repair & Contracting Company, Montreal, Que., registered. G. E. Matthews and F. H. Hand.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

GERMAN ALSEN, at higher prices than competitors, has again this year been awarded the most important contracts of the World, because practical tests by leading Engineers proved its merit and relative economy.

Note the following :

		1905—1906		1905—1909
MEXICO CITY		**120,000** bbls.	**U.S. PHILIPPINE GOVMT.**	**40,000** bbls.
NECAXA DAM	(shipping instructions so far 60,000 bbls.) approximate amount	**175,000** bbls	**GOVMT. ORDER SOUTH AMERICA**	**150,000** bbls.
XOCHIMILCO WATER WKS., MEX.	approximate	**200,000** bbls.	**RIO DE JANEIRO, SATOS, ETC.**	**40,000** bbls.

- **Also enormous quantities for the PACIFIC COAST, AUSTRALIA, ENGLAND, SOUTH AFRICA, &c.** -

There is always a certain trade who will pay for the best. We also make American Alsen, the highest grade of domestic Portland cement.

CEMENT **45 BROADWAY, NEW YORK CITY** **CEMENT**

We protect our customers!

See page 155 in "Sweet's" for full particulars

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co.
Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

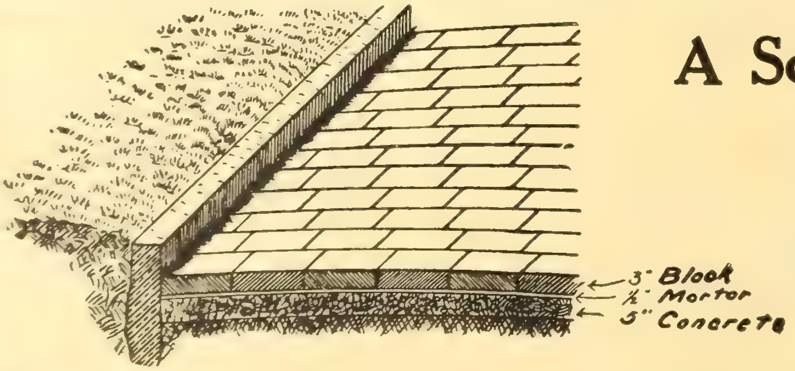
The Last Word in Wire Lathing

1910 **Patented Trussed** 1910

Wire Lath

FOR DESCRIPTION AND PRICES
APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

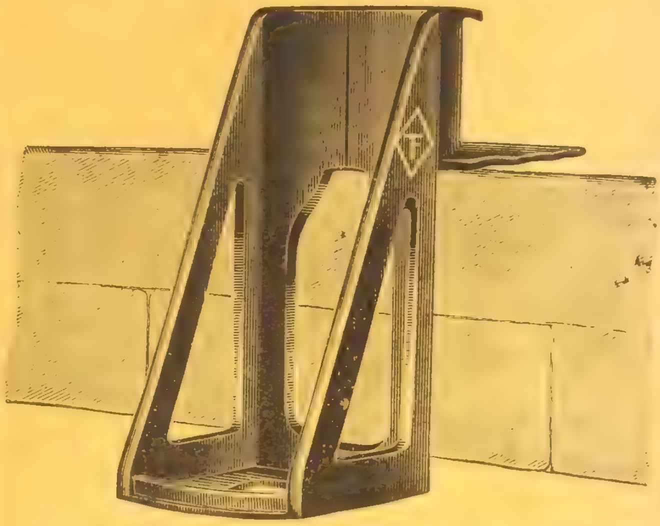
"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Builders' Joist Hangers
ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

A FULL LINE

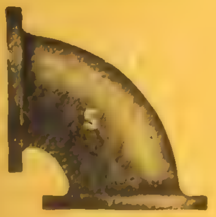
is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR **S** BRAND

It Means Standard

Flanged Elbow



Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

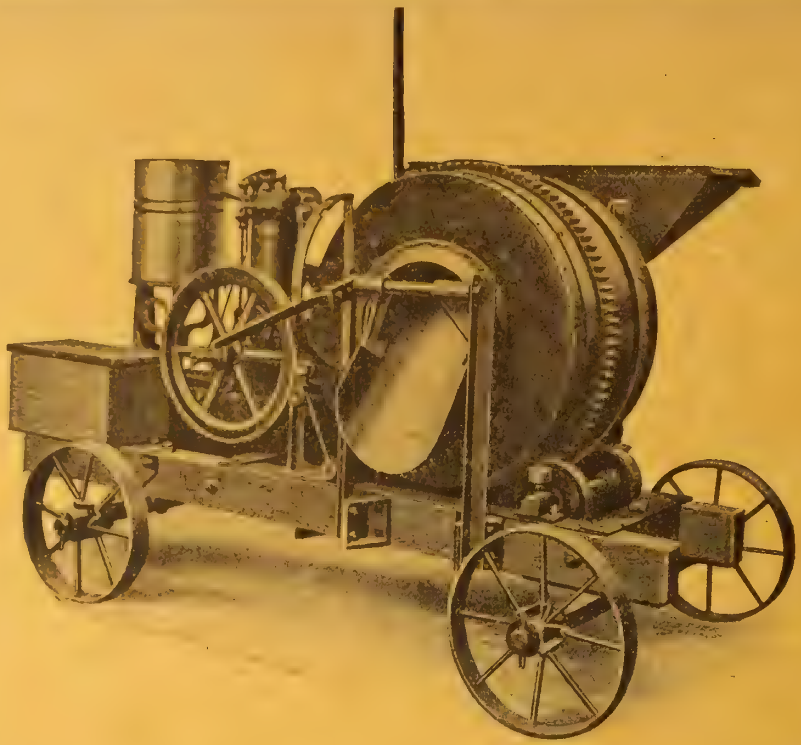
House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



This is Every Man's Mixer

NO. 4 RANSOME—NEW 1910 MODEL

At last the demand for a really **small** concrete mixer is satisfied. Hold on, now, Mr. Big Contractor, that doesn't let **you** out, either. This is **Every Man's Mixer**—the mixer that fits into everybody's need. There isn't a concrete job on earth so small that it can't be done better and cheaper with this new model No. 4 Ransome, and there isn't a contractor anywhere whose work is so big that he will not find it a convenience and an economy to have one of these little No. 4's in addition to his larger machines. The No. 4 can be used on the small, isolated parts of jobs where it wouldn't pay to move a big machine.

Everybody who builds concrete walls, concrete walks, concrete **anything**, can have the best concrete that can be made at the least possible cost, because our new No. 4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an **exact reproduction,** on a small scale, of the Ransome that made the correct mixing of concrete **cheap**—it's the same wonderful mixer in miniature. This is **the first really modern, effective, and economical small mixer ever put on the market.**

The following description of the No. 4 Ransome will show you what a truly **complete** and highly efficient mixing outfit you can buy at a very low price.

It has a batch capacity of 4 cubic yards per hour, which is ample for any small concrete job.

It is made and sold in **one way only,** i.e., **mounted on trucks,** with a Gasoline Engine, **direct drive.** This is a powerful engine for its rated H.P. and the best designed—a most perfect-operating engine.

The No. 4 is fully equipped with **Gasoline Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates** and All Necessary Engine and Mixer Fittings—**an absolutely complete outfit, ready for perfect operation.**

The Drum is 36″ in diameter and 24½″ in length, and has a speed of 24 revolutions per minute.

For its size this is the most substantially built mixer. The drum plates are ⅛″ thick; the scoops ⅛″ thick; the counter shafts 1 7/16″; the traction rings ½″; face of traction rings 1½″.

The mixer has only 16 parts all told and **only four wearing parts.** It is the Extreme of Simplicity—you can keep one extra part on hand—a journal. The journals are the only wearing parts. No danger of breakdowns. It is everlastingly durable and reliable.

The No. 4 Ransome is a great time saver in every respect. The charging hopper is being filled **while the batch is mixing,** so that no time is lost in charging. The batch is instantly discharged by merely reversing the discharge chute.

It is also a great economizer of **time** and **labor** because it is **not a tilting mixer**—it needs no room for clearance—is mounted several feet lower than any tilting mixer—a great saving in time and labor of elevating the materials into the mixer.

The No. 4 Mixer is equipped with a series of blades or scoops inside the drum, which produce a rubbing-grinding contact of the particles in the concrete, a combination of rolling contact with forcible kneading. Being the same in this respect as the larger Ransomes, it follows that the user of the new No 4 Ransome, although mixing in small batches, will get precisely the same **intimate** and **thorough** mixture for which the Ransome is unique. The user of a No. 4 may know positively in advance that his concrete will be a perfect, uniform mixture—sound throughout—no unmixed spots anywhere—no danger of the concrete crumbling after setting.

Because of this thorough mixing, the No. 4 Ransome permits of **real cement economy.** It will give **maximum** strength with the **minimum** cement countenanced by engineers.

The new 1910 Model No. 4 Ransome is small, compact, easily **portable.** Mixer, engine, and trucks complete, weigh 1750 lbs.

We carry No. 4's in our Warehouses for immediate delivery. Write for price, terms and additional information.

We give with each of these mixers an absolute and unequivocal **guarantee** that the No. 4 Ransome under equal conditions will mix more concrete, mix it better, in less time, and with less labor, repairs and expense, than any other mixing device.

F.H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, August 3, 1910 No. 31

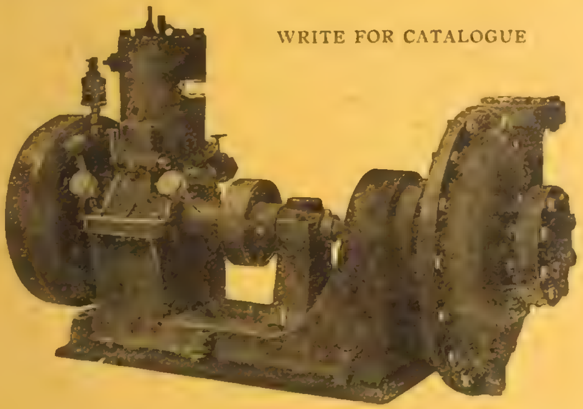
ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps,
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE



The Smart-Turner Machine Company Limited
HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

The Mark of the Best

"Dominion Crown"

Canada Plates

Black and Galvanized

Look Best, Wear Best, and Are Best

A. C. Leslie & Co., Limited
Montreal

Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

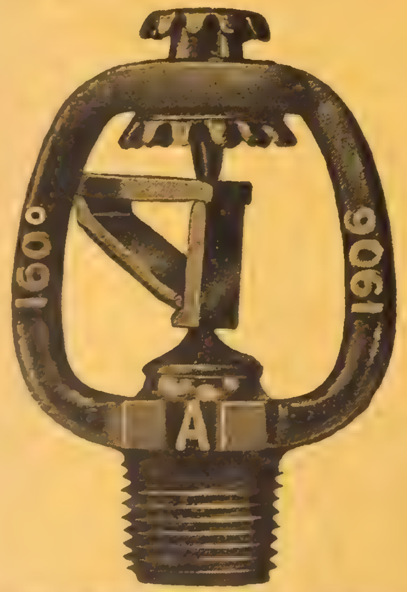
$20,000,000.00!

Canada's Annual Fire Loss.
What Proportion Do You Pay?

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums
For particulars and free estimates communicate with



The "Rockwood" Approved by all Canadian and American Insurance Associations

The Rockwood Sprinkler Co., of Canada, Limited, Montreal

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Automatic Sprinklers Page
Rockwood Sprinkler Co 2

Architectural Iron Work
Canada Wire Goods Mfg. Co 15
Dennis Wire & Iron Works 58

Boilers
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 49
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co ......
Waterous Engine Works Co. 53

Brick
American Enamelled Brick Co. 63
Canadian Pressed Brick Co 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co 5
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co. 34

Bridges (Steel)
Canadian Bridge Co 54
Cleveland Bridge Co. 54
Dickson Bridge Works ......
Dominion Bridge Co 54
Phoenix Bridge and Iron Works 55
Pennsylvania Steel Co. 54

Builders' Hardware
Taylor-Forbes Co. ......

Cement
Alsen Portland Cement Co. 62
Britnell & Co 58
Bremner, Alex 57
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 60
Rogers, Alfred 4
Rogers Supply Co 31
Sand and Supplies 59
Stinson-Reeb Builders Supply Co. 58

Conduits Page
Conduits Co., Limited 58

Concrete Mixers and Machinery
Canada Foundry Co 14
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F., H 64
Jenckes Machine Co 2
London Concrete Machinery Co. 21
Mussens Limited 32
Morrison & Co., T. A 60
Rogers Supply Co 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co ......
Canada Wire Goods Mfg. Co. 15
Hamilton Iron & Steel Co. 34
Trussed Concrete Steel Co. 52

Contractors' Plant
Beatty & Sons, M. 55
Hepburn, John T 17
H. & E. Lifting Jack Co. 55
Hopkins & Co., F. H 64
Katie Foundry Co 60
Marsh & Henthorn 49
Mussens Limited 32

Crushers (Stone and Rock)
Hopkins & Co., F. H. 64
Jenckes Machine Co 2
Mussens Limited 32
Morrison & Co., T. A 60

Corrugated Iron
Galt Art Metal Co 20
Metallic Roofing Co 51
Metal Shingle and Siding Co. ......
Ormsby, A. B., Limited 5
Roofers Supply Co 49

Contractors Page
McIlwraith, Jas. A. 60

Drills
Beatty & Sons, M 55
Canadian Rand Co 1

Deafening Felts
Cabot, Samuel, Inc. 59

Drilling Contractors
Harvey, J. 61

Dredges
Beatty & Sons, M 55

Engines
Inglis, John 22
Jenckes Machine Co 2
Mussens Limited 32
Waterous Engine Works Co. 53

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co. ......

Engineers (Civil and Mechanical
Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Davis & Johnston 60
Farmer, John T. 60
Fuce, Edw. O. 60
Galt Engineering Co., John 60
Glaubitz, H. J. 60
Hunt & Co., Robt. W. 59
Inglis, John 22
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H. 60
McRae, John B. 60
Moore & Scollan 60

Fire Apparatus Page
Morrison & Co., T. A. 62
Seagrave, W. E. 58

Fireproof Doors and Windows
Douglas Bros 53
Mussens Limited 32
Ormsby, A. B. 5

Granite and Marble
Laurentian Granite Co. 60
Missisquoi Marble Co. 13
Rogers Supply Co. 31
Smith Marble & Construction Co. 52

Glass
Chance Brothers & Co. ......
Consolidated Plate Glass Co. ......
Luxfer Prism Co. ......
Thompson & Co., B. & S. H. ......
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 52
Taylor-Forbes Co. ......

Hoisting Machinery
Beatty & Sons, M. 55
Inglis, John 22
Jenckes Machine Co. 2
Hopkins & Co., F. H. 64
Marsh & Henthorn 49
Mussens Limited 32
Scott Machine Co 5

Hydrants
Canada Iron Corporation 57
Gartshore-Thompson Pipe Co. 56
Kerr Engine Co 8

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co 55

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 **28 King Street West, TORONTO**

THE MILTON PRESSED BRICK Co.
LIMITED

For 20 Years The Finest Brick Made
Milton Pressed Brick

is the hardest and smoothest brick—is perfect in mould—always uniform in size—clean cut—cannot collect dirt—absolutely free of sand and gravel—improves with age—and looks as fresh and clean after 20 years' use as when first put in the wall.

Head Office: Milton, Ont. Toronto Office: Janes Building
EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St,

We have 50 Kalameined Clad Fireproof Doors in the Traders Bank Building, Toronto

They mean a **big reduction** in their **Insurance Rates.** They have **artistic,** as well as **Fireproof Doors,** something in keeping with the building.

Specify a Kalameined Clad Door that has this artistic appearance, that is the ORMSBY "UNDERWRITERS" made to any detail, and made without any bulging between the wood and the iron.

Let us give you an approximate figure

A. B. ORMSBY, Limited
Factories
TORONTO and WINNIPEG
Experts in Fireproof Windows and Doors

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	51
Blonde Lumber Co	
Del aparte, Ltd	20
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	63
Rhodes Curry & Co	
Sanitary Floor Co.	57
Siemon Bros	51
Standard Mills, Limited	62
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	20
Metallic Roofing Co.	51
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co	15

Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	19
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	
Britnell & Co	58

Pipe

Canadian Pipe Co.	56
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	56
Municipal Construction Co.	17
National Iron Works	57
Pacific Coast Pipe Co.	1
Pedlar People	49

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	59
Glidden Varnish Co	34
International Varnish Co.	56
Paterson Mfg. Co.	16

Pile Driving

	Page
Lincoln Construction Co.	58

Pumps and Pumping Machinery

Beatty & Sons, M.	55
Goulds Pump Co.	
Hopkins & Co., F. H.	64
Inglis Co., John	22
Martin Steam Pump Co.	63
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	55
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	53

Roofing Materials

Barrett Mfg. Co.	16
Brantford Roofing Co	11
Galt Art Metal Co.	20
Metallic Roofing Co.	53
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	49

Railway Supplies

Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	14
Case Threshing Machine Co.	19
Climax Road Machine Co.	56
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	18
Britnell & Co	58
Canada Iron Corporation	19
Dominion Sewer Pipe Co.	18
Gartshore-Thomson Pipe Co.	18
Hamilton & Toronto Sewer Pipe Co.	19
National Iron Works	57
Ontario Sewer Pipe Co.	10
Rogers Supply Co.	31
Standard Drain Pipe Co.	18
Toronto Pottery Co	18

Sand

Rogers Supply Co.	31
Sand & Supplies	57

Stone

	Page
Britnell & Co.	54
Christie, Henderson & Co.	17
Consolidated Stone Co.	20
Contractors' Supply Co.	49
Corinthian Stone Co.	15
Crushed Stone, Limited	59
Doolittle & Wilcox	57
Hagersville Contracting Co.	5
Laurentian Granite Co.	69
Maloney John	55
Morrison & Co., T. A.	60
Myers, Oakley	52
Robertson, D	59
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	59
Wiarton Stone Quarry	61

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	54
Hamilton Iron & Steel Co.	34
MacKinnon Holmes & Co.	55
Pennsylvania Steel Co.	54
Phoenix Bridge & Iron Works	55
Queen City Foundry Co.	60
Reid & Brown	60

Shovels (Steam)

Beatty & Sons, M.	55
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	59

Slate

Roofers Supply Co.	49

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Safes and Vaults

Taylor, J & J	

Sheathing Papers

Cabot, Samuel, Inc.	59

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	52

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	49
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	55

Typewriters

United Typewriter Co.	62

Valves

Canada Iron Corporation	57
Gartshore-Thomson Pipe Co.	56
Kerr Engine Co.	8
Standard Fitting & Valve Co	63

Ventilating System

Gardiner & Gaskill	53

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	59

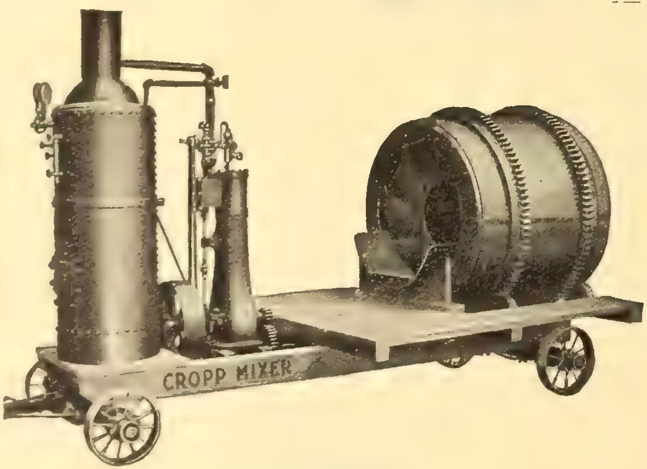
Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	56
Smith, Thos. & Wm.	

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	15

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices
Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Don Valley Bricks

and Porous Terra Cotta Fireproofing

DON

TERRA COTTA

DON

DON

TERRA COTTA

DON

Pile of Fireproofing

Be sure and specify "Don Valley Terra Cotta Fireproofing" on every job, its value has been proved.

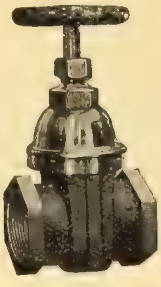
We also market brick of every desirable size, color, shape and quality.

THE DON VALLEY BRICK WORKS

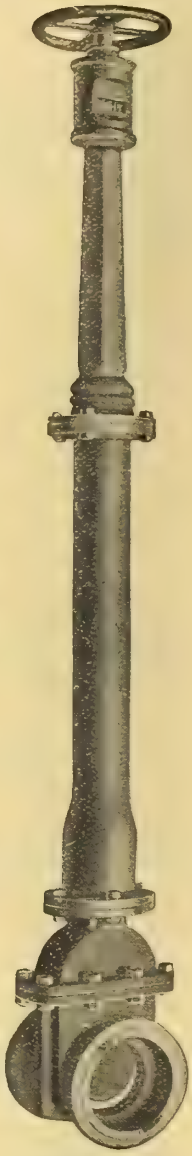
Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Water Crane and
Hydrant Combination

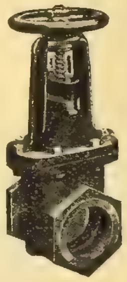

Webber Gate
(Brass

Hub End Gate


Indicator Post for
Fire Protection Valve

IRON

BODY



GATE

VALVES

Compression
Hydrant

KERR

Our policy of careful manufacture for severe duty is maintained throughout our whole establishment and as a result our products are of the highest quality.

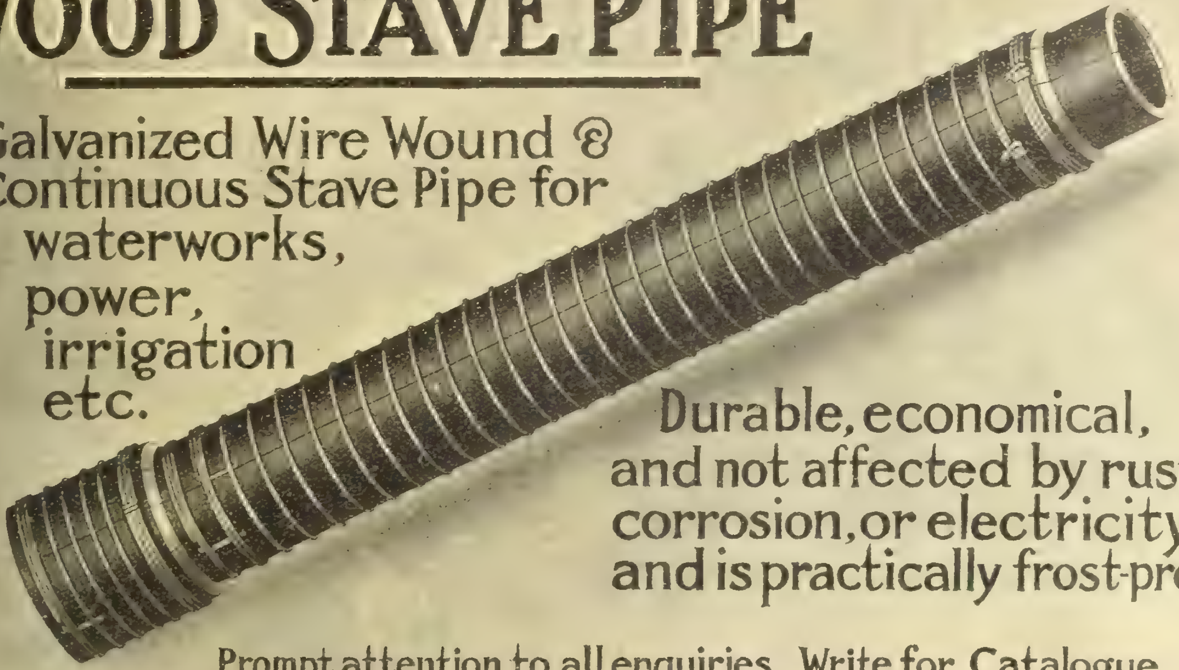
Every "KERR" valve is accurately made and finished. They are perfectly tight when closed and have full area when open.

We have a complete catalogue

Have you a copy of it?

VALVES

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.



WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

When You Want Good Sewer Pipe

Don't forget that there is one place where you will be sure of the **best** article and the very best treatment.

Drop a line to

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

"MIMICO" Pipe Makes the Sewer Sure

Why Shingle a House when Brantford Roofing is better

Many builders and contractors, who have made a close study and inspection of the different classes of roofing materials on the market, recommend Brantford Roofing for use on dwelling houses as well as on factories and stores.

They do so, because Brantford Roofing makes a neat and attractive appearance on the roof;

Because Brantford Roofing makes a perfectly watertight roof;

Because Brantford Roofing will not melt in summer or turn brittle and crack in winter;

Because Brantford Roofing is fire-resistant;

Because Brantford Roofing is more than TWICE as durable as wooden shingles, yet costs no more.

Send for our big roofing booklet. It gives valuable facts about roofing materials.

Also ask us for samples of Brantford Roofing.

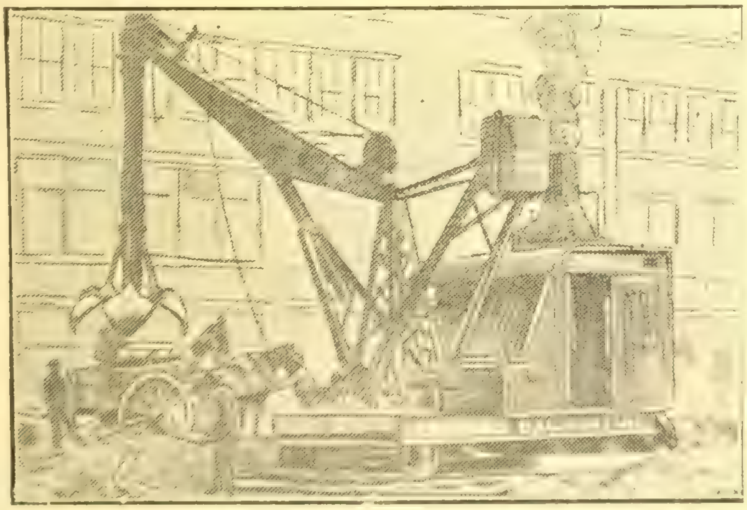
Brantford Roofing Company, Limited
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

The Advantage of the

J. W. Harris Excavator



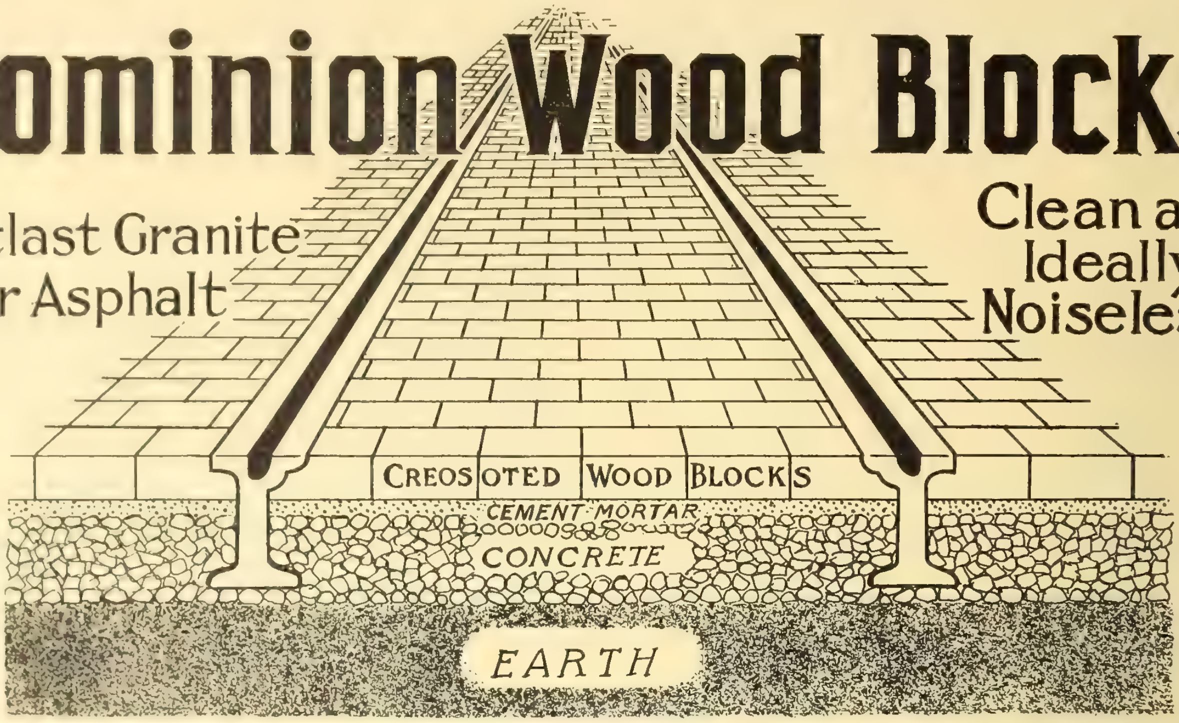
is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

J. W. Harris Mfg. Company, Ltd.
MONTREAL

Dominion Wood Blocks



Outlast Granite or Asphalt

Clean and Ideally Noiseless

A Pavement that Gives Ideal Results

Dominion Wood Blocks make a pavement that is exceptionally sanitary and satisfactory.

The wood does not pulverize, like brittle stone pavements, and does not produce dust.

The blocks are made of live Douglas fir (best timber in the world for the purpose), they are made waterproof, and they will not decay because they are impregnated with creosote.

There will be no ruts along the street car rails because the Wood Blocks do not suffer from vibration.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

"Made-in-Canada"

goods are being used now by everybody and we are proud of them because they are often better than imported materials

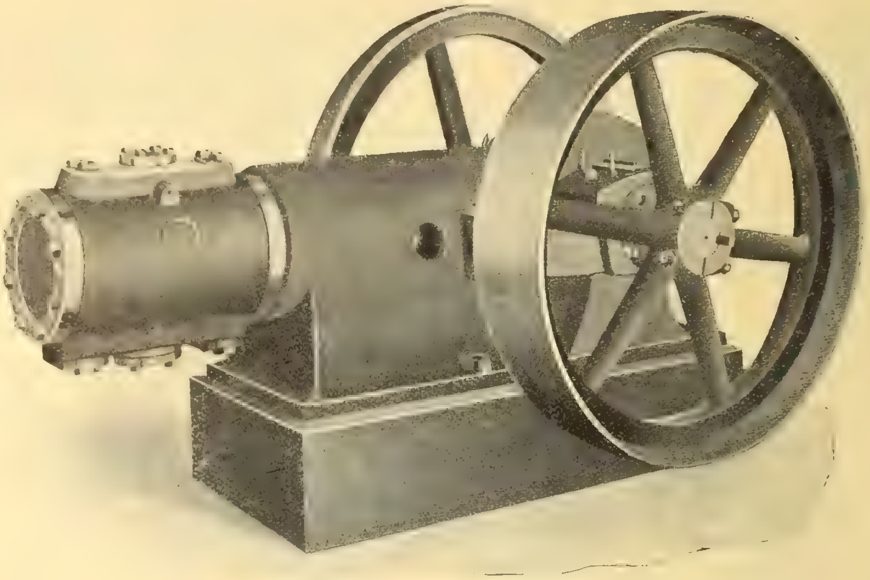
Quarried-in-Canada

marble is just as good as fancy-priced imported marble and comes in six well-defined varieties which allow of elaborate color schemes.

The Missisquoi Marble Co., Limited
Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
Bosse & Banks, Quebec
Jas Robertson & Co., St. John, N. B.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver
General Contractors' Supply Co., Halifax
Also Branch Office, 85 Sparks St., Ottawa, Ont.



Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.

Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

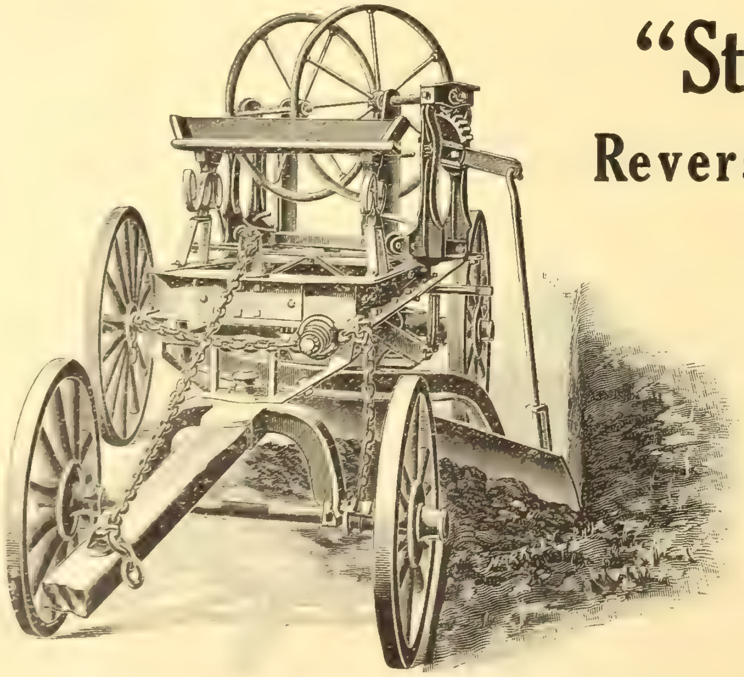
Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery



Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our prices on our

CONCRETE REINFORCEMENT

Continuous lengths or in sheets cut to size

WINDOW GUARDS

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone

Company, Guelph

from the hardest substances available

Write the

Corinthian Stone

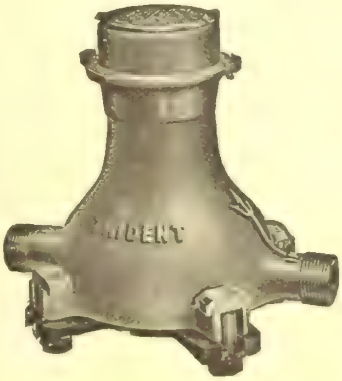
Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless, fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc. has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.

CUT STONE

All kinds of Canadian and American Stone

D. ROBERTSON & CO.

Limited

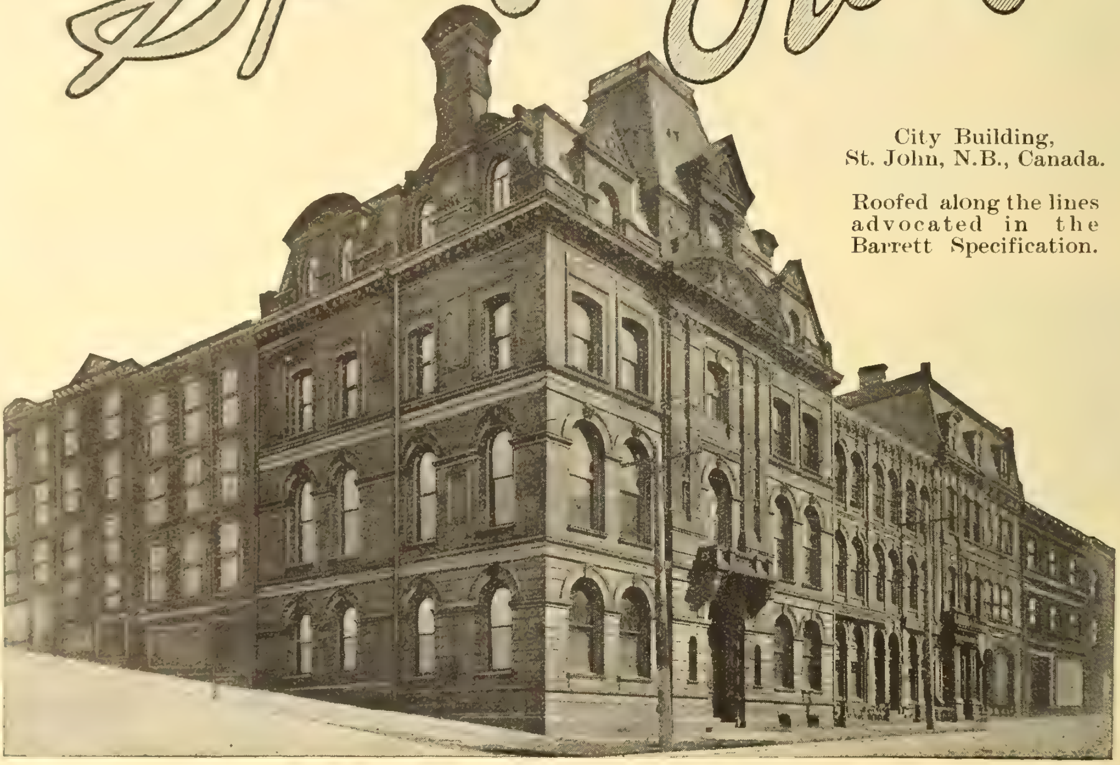
Offices
[illegible] Yonge Street, TORONTO
MILTON, Ont.

Yard
Manning and Dupont, TORONTO

Quarries
MILTON
CREDIT FORKS

[illegible]
[illegible]
Milton 32

Barrett Specification Roofs



City Building,
St. John, N.B., Canada.

Roofed along the lines advocated in the Barrett Specification.

After Twenty-Seven Years of Service

THE roof of this structure was laid in 1882. A letter recently received from the contractors states that it is still in good order *after 27 years of service.*

As compared with other kinds of roofing, and considering the wide variation of temperature in New Brunswick, this is an astonishing record. It emphasizes the satisfactory results which Barrett Specification Roofs invariably give.

The architect or owner of a building who will order his roofing laid "according to The Barrett Specification" and *insist that the Specification be followed to the letter,* is absolutely assured of *satisfactory service.*

It is well to remember that with Barrett Specification Roofs there is no maintenance expense whatever. Metal and Ready Roofings *require paint and attention every few years* to insure freedom from leaks and trouble.

Every architect, engineer and owner should have the Barrett Specification on file. We will send same promptly to anyone interested on request to our nearest office.

The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF
Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE
All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

is the best

BECAUSE
It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

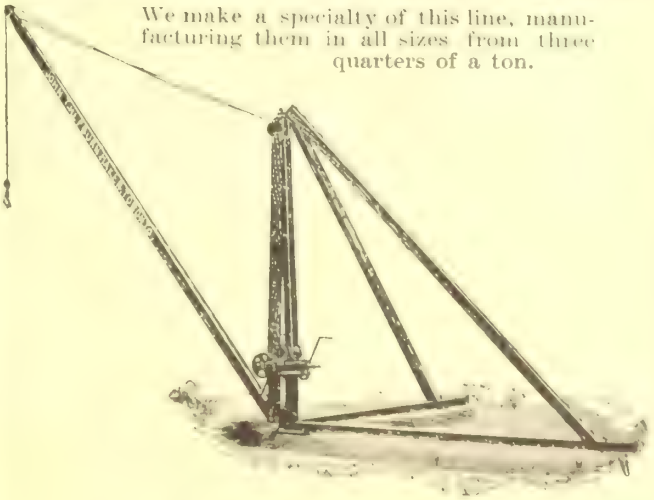
Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
[illegible]

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

Sewerage Acids do not affect the

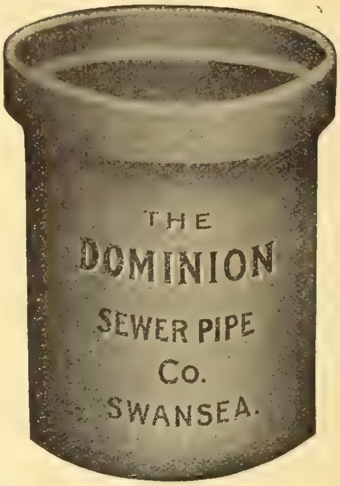
Sizes 3 in. to 36 in.

The Standard for Quality in the United States and Canada

Fancy shapes in Chimney Tops, Fire Clay Stove Pipe and Fittings, Wall Coping, Fire Clay Flue Liners, Fire Brick and Fire Clay.

The Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.
Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe

Single and Double Strength. Sizes 3″ to 42″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

The Mint is about the only Concern that can make Money without much Effort

But in making money out of **Sewer Pipe** your efforts are greatly reduced if you will only specify

Hamilton Salt Glazed Vitrified Pipe

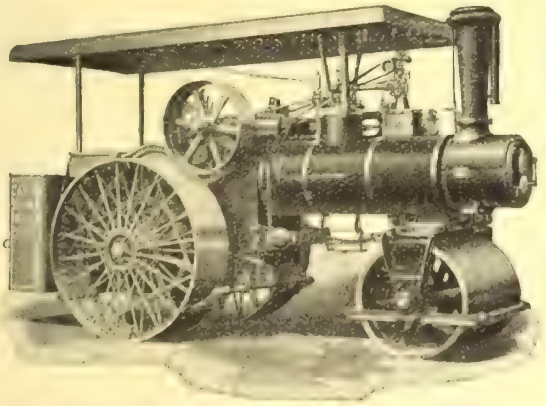
The leading pipe of its class in Canada. A half a century building up influence, and to-day the most progressive in the business. We pride ourselves on prompt delivery, good pipe too, we assure you. Write us to-day.

The Hamilton & Toronto Sewer Pipe Co., Limited

Long Distance Phone: Hamilton 3990, 3991
Toronto, Main 990, Coll. 1558

Hamilton and Toronto

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description. Guaranteed to do all or Anything that can be done by Any Other Make or Design of Road Roller.

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba, Calgary, Alberta, Regina, Saskatchewan, Toronto, Ontario.

Send for our Contractors General Purpose Engine and Municipal Tractor Catalog 26.

Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE
CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read The Cement Era. The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.

1800 Monadnock Block - - CHICAGO

Corrugated Iron

For factories, elevators, warehouses, barns, etc.

"Galt" Corrugated Sheets

are the *cheapest*, *handiest*, and *most satisfactory* roofing and siding. Best for permanent buildings because, being made from high-grade galvanized iron, they are *indestructible* by time or fire. Best for temporary construction because they are easily removed and used again.

Complete line of Corrugated Ridge, Flashings, etc. Sheets of all sizes and gauges.

You should have Catalog 4-B illustrating these goods free to readers of the Contract Record.

THE GALT ART METAL CO., LTD.
GALT, ONTARIO
Winnipeg - - Dunn Bros.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

Interior of "Men's Own" Winnipeg—John Atchinson, Architect.
Herringbone Lath and Perfection Studs Used Throughout

Herringbone Metal Lath

with Perfection Studs make the best fireproof partitions known. Like all fireproof partitions they expand in a fire. Unlike all others, they buckle, but do not crush. "Some Facts" a book about it sent you on request.

CLARENCE W. NOBLE
GENERAL SALES AGENTS
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

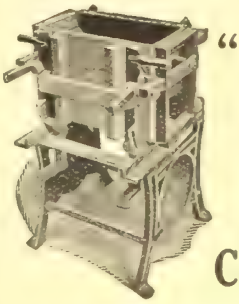
This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada



"London"

Face-down

Adjustable

Concrete Block Machine

The MOST COMPLETE EQUIPMENT EVER OFFERED IN ANY HIGH-GRADE BLOCK Machine. PRICE ONLY $75.00. WHY PAY AN EXHORBITANT PRICE FOR BLOCK MACHINE making only one width of wall when you can purchase a HIGH-GRADE ADJUSTABLE MACHINE making ALL SIZES AND STYLES of blocks for all widths of walls at a moderate price. OUR MACHINES ARE FULLY COVERED BY PATENTS. WE CAN SAVE YOU MONEY. Write us for full particulars.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Molds, Sill Molds, Ornamental Molds, Cement Working Tools and a full line of Concrete Machinery.

Don't fail to see the largest exhibition of Concrete Machinery ever exhibited by one firm in America. We will be at our old stand at Toronto Fair, the northwest corner of Art Building immediately south of the Machinery Hall on the grounds.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is [illegible] inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilating the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horror.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

Please Send for Samples and Prices

J. R. Eaton & Sons

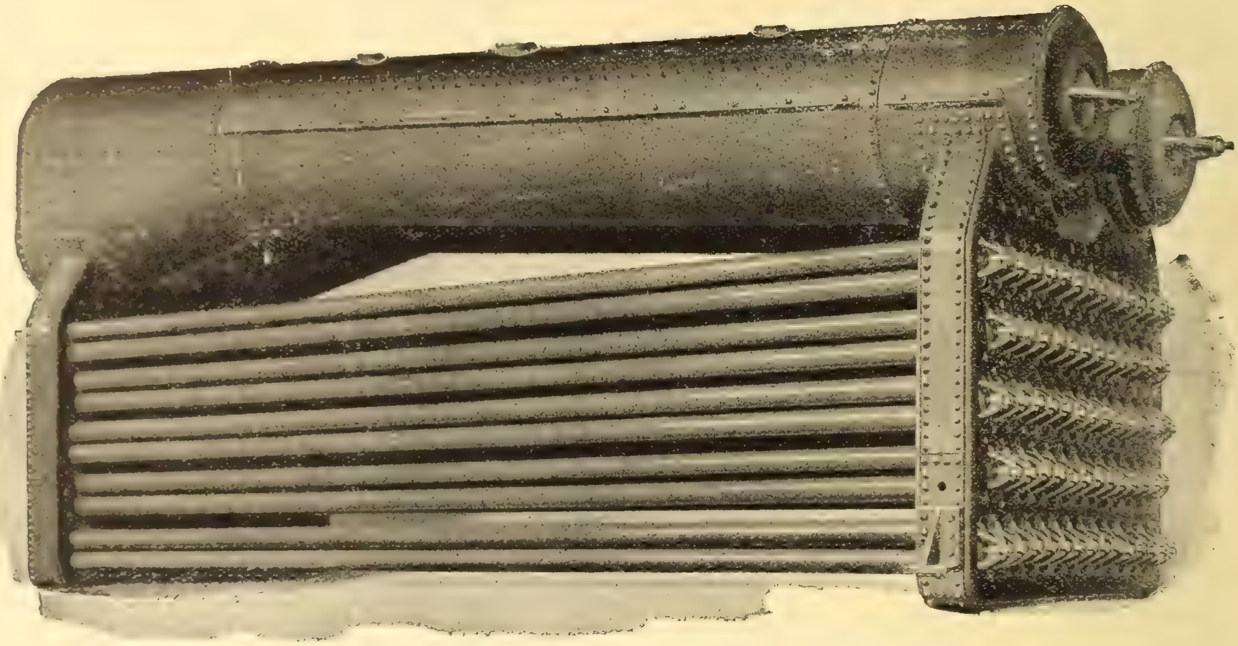
Orillia, Ontario

Montreal Agent THE HARDWOOD FLOORING CO.,
55 St. Francois Xavier St.

Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brockville, Ont.

The tenders for the erection of new pumphouse were as follows: Barclay, Fair & Fox, granite and brick, $12,996; Street & Anderson, granite and brick, $10,911; Stret & Anderson, brick, $10,661; W. Patterson, concrete, $9,000; W. Patterson, granite and brick, $9,481; W. Patterson, brick, $9,600. Work will be done by day labor.

Chilliwack, B.C.

The by-laws for drainage improvements and purchase of road machinery were carried.

This municipality requires a rock crusher. $10,000 is available.

Hamilton, Ont.

S. Cheeseman's tender for the St. Patrick street sewer was $1.75 a foot. The city engineer bid $1.05, and will build it.

Tenders addressed to J. L. McLaren, chairman Board of Control, will be received until August 3rd for constructing sewers on Hillyard, Gilkinson, Niagara and Wentworth streets.

New Westminster, B.C.

The by-law to vote $150,000 for street improvement was carried.

North Toronto, Ont.

The council sanctioned the assessment of some six miles of water mains and about the same of concrete sidewalks.

Orangeville, Ont.

The by-law to procure system of waterworks was carried. See Public Buildings.

Strathcona, Alta.

For unavoidable reasons it is not possible to proceed with the construction and installation of the sewage demonstration plant which is to be established here, until after the session of the legislature.

St. Thomas, Ont.

Tenders for concrete reservoir, capacity 900,000 gallons, were received as follows: G. A. Ponsford, St. Thomas, $12,930; A. E. Ponsford, St. Thomas, $13,300. These tenders were considered too high and no contract was awarded.

Vernon, B.C.

Tenders addressed to S. Somerville, city treasurer, will be received until August 29th for the purchase of the following debentures: Waterworks extensions, $10,000, 25-year, 5 per cent.; local improvement cement walks, $8,000, 15-year, 5 per cent.; sewer extensions, $3,500, 25-year, 5 per cent., etc.

AWARDED.

Islington, Ont.

The tenders for the erection of a steel concrete culvert on the Burgess side road were as follows: R. J. Low, $375; I. M. Scott, $355 (awarded). R. J. Lowe's tender of $325 for a steel concrete culvert on the Albion road was accepted.

Lacombe, Alta.

The contract for construction of concrete sidewalks was awarded to Davidson & Westaway, Calgary, at 23½ cents per square foot; curb and guter at 68 cents per lineal foot. Oother bids: for walks, 24. 35 and 36 cents; for curb and gutter, 60 and 75 cents.

North Bay, Ont.

The contract for construction of concrete sidewalks has been awarded to the D. W. Mitchell Construction, of Niagara Falls, Ont. Other tenderers were, W. G. Carr, North Bay, H. A. Nickle, Owen Sound, and R. L. Francis, Huntsville, Ont. Tender was awarded at a price of 10 3-4 cents per square foot. M. W. Flannery, town clerk.

Outremont, Que.

The Outremont council has awarded contracts for the construction of six brick and three tile sewers at an approximate cost of $60,000, as follows: W. G. A. McDonald, Champagneur avenue, Querbes avenue, De l'Eppe avenue and Rockland avenue; R. T. Smith & Company, Maplewood avenue, Sunset avenue and Pagnuelo avenue; M. Lapointe, Bloomfield avenue; and W. Duquette, Outremont and Wiseman avenues.

Peterboro, Ont.

The contract for concrete walks of the Township of North Monoghan has been awarded to James Boyer at 9 7-8 cents per square foot.

Railroads, Bridges and Wharves

Aylmer, Que.

Tenders are being called by Public Works Department for construction of a wharf. R. C. Desrochers, assistant secretary.

Chatham, Ont.

The Western Bridge & Equipment Company contemplate building a new plant to accommodate their increased business, and would like to have an assurance of a fixed assessment.

Galt, Ont.

The Board of Works have decided to call for tenders for the construction of cement bridges over the creek on Anislee and also on Kerr street.

Kamloops, B.C.

Plans are now being prepared by direction of the Minister of Public Works for the new bridge across the Thompson river at Walhachin. The work will be started this fall as soon as low water permits, and the bridge, a handsome steel structure, will cost about $30,000

New Westminster, B.C.

The $30,000 by-law for Lulu Island bridge was carried.

North Vancouver, B.C.

The money by-law on bridge propositions was carried.

Quebec, Que.

It is stated that 83,000 tons of steel will be required for the Quebec bridge. It is expected that the bids will be taken about September 1st.

St. Catharines, Ont.

The Buffalo, Niagara & Toronto Railway by-law will not be voted upon, nor will it be voted upon on August 8th at Niagara-on-the-Lake, owing to decision of directors.

Victoria, B.C.

The proposition from J. Wolkenstein, of New York, president, British Columbia & Alaska Railway Company, to build the 800 miles from here to Fort George will likely come before the government shortly. Surveys have been completed by L. M. Rice Company, of Seattle. Estimated cost, $25,000 a mile.

The Canadian Northern Railway has applied to the Dominion Government for a charter for a railway to run from Edmonton to Bear River on the Portland canal.

Vancouver, B.C.

The promoters of the bridge across the Second Narrows of Burrard Inlet are now considering the choice between two forms of low level bridges. The location plans for the bridge have already been approved.

AWARDED.

Chatham, Ont.

The following tenders for laying concrete floor on south approach to Kent bridge were received: G. Fielder, of this place, $575 (accepted); W. Graham, Kent Bridge, $825; A. S. Everett, Thamesville, $925; G. Coumbar, Chatham, $1,325.

Edmonton, Alta.

It is stated that the contract for the substructure of the big million dollar high level bridge over the Saskatchewan connecting Edmonton and Strathcona was let by the C. P. R. to John Gunn & Sons, of Winnipeg. The C. P. R. has charge of the building of the bridge.

Port Arthur, Ont.

The following tenders for construction of concrete bridge over Current river were received: Seamon & Penniman, Port Arthur, $17,792.75; Stewart & Hewitson, Port Arthur, $20,687.10. Contract awarded to the former. J. Antonisen, engineer.

Vancouver, B.C.

W. P. Tierney, Nelson, has been awarded the contract for building a ten-mile section of the C. N. R. in the Fraser River valley. Chas. Johnson, of Seattle, has a sub-contract.

Public Buildings, Churches, Schools, etc.

Battleford, Sask.

Tenders for construction of post office will be received until August 22nd. R. C. Desrochers, assistant secretary, Department of Public Works, Ottawa. J. Greenfield, resident architect, Winnipeg, Man.

Beaverton, Ont.

Tenders will be received until August 10th for the electric wiring of the town hall. L. J. Cameron, Chairman Building committee.

Britcola, B.C.
Tenders will be received for supplying and installing heating appliances for North Hastings school. C. Corder, secretary.

Chilliwack, B.C.
The City Hall by-law was carried.

Digby, N.S.
Tenders for electric light fixtures, wiring, etc., for the public building here, will be received until August 10th by Public Works Department, Ottawa. R. C. Desrochers, assistant secretary.

Edmonton, Alta.
Tenders addressed to J. Stocks, deputy minister, will be received until August 4th for supply of about 200,000 square feet wire fabric for concrete floors for Parliament Buildings.

Eganville, Ont.
We are informed that no tenders for the erection of a school here had been received at the time specified. Simpson & Young, architects, Toronto. J. R. Campbell, secretary, P. S. Board.

Edwardsburg, Ont.
Tenders were called until August 3rd for erection of school house, section 20. Plans, etc., with S. L. Spicer, secretary-treasurer, Prescott. C. N. McFarlane, chairman, Cedar Grove.

Enfield, Ont.
Tenders addressed to R. Pascoe, secretary, will be received until August 8th for erection of brick school, Section No. 15, Darlington. Plans, etc., at Mr. A. Ormiston's, this place.

Fort George, B.C.
The site for the new government buildings has been chosen at corner of Central and Winchester avenues. Construction will proceed at once. Government agent, Mr. Randall.

Guelph, Ont.
A suggestion has been made by the County of Waterloo that the County of Wellington co-operate in the erection of large tuberculosis sanitorium. J. P. Downey, M.P.P., president, local anti-tuberculosis league. W. Brewster, Hespeler, secretary for Waterloo association.

Grand Valley, Ont.
No tenders were received for erection of school here. Architect Geo. Gray, Harriston.

Montreal, Que.
The Portestant School Commissioners of Longue Pointe Ward, will erect a new school building. Trustees—S. A. Gidlow, Alex. Robertson and Albert Clark. Secretary-treasurer, H. Martin Gower, M.A.

The Post Office Building on St. James street will be rebuilt instead of repaired as originally intended. Steel work and fireproofing the old building will be the new order, in order to give more room and light.

The St. Georges Home will have certain alterations made to their property on Lagauchetiere street. Mr. Walter Livermore, Building Superintendent, 72 Anderson street.

The members of St. James Club, located at the corner of University avenue and Dorchester street are at present considering extensions which may either take the form of additions to and remodelling of their present premises at an expense of approximately $100,000 ,or this structure may be demolished and a new one erected at a cost of $300,000. Nothing has yet been definitely decided. Lieut.-Col. Starks, Dominion Transport Company, is secretary of the building committee.

Tenders are now being invited and will be received until August 20th for the construction of new Central Y. M. C. A. building. Messrs. Ross & MacFarlane, architects.

North Vancouver, B.C.
The Knights of Pythias propose to erect a hall at the corner of Chesterfield avenue and Fourth street at a cost of about $15,000. Mr. Jamieson, architect.

Orangeville, Ont.
The by-law to issue debentures for $20,000 to be expended in general improvements, including the erection of a town hall and procuring a system of waterworks was carried.

Ottawa, Ont.
Weeks & Keefer, architects, will call for tenders shortly for a fire station on Cumberland street. It will be three storeys, of solid brick, 102 by 43 feet. Estimated cost $25,000.

Horwood, Taylor & Horwood have been chosen as architects for an addition to Perley Home for Insurables on Wellington street. Taylor and Lackey have the general contract.

Red Deer, Alta.
Tenders will be received until August 12th for furnishing, hauling and putting on fix drop siding on Willowdale schoolhouse. G. McIntosh, secretary, Willowdale, S.D

Sedley, Sask.
Tenders are called until September 1st for erection of fire station and hall here. Reilly, Dawson & Kelly, architects, 108 Willoughby and Duncan streets, Regina.

Souris, Man.
Tenders addressed to R. C. Desrochers, assistant secretary, Department of Public Works, will be received until August 15th for the erection of public building here.

Saskatoon, Sask.
Tenders have been received for the erection of Anglican college and principal's residence for University of Saskatchewan, but no awards have yet been made. Messrs. Brown & Vallance, architects, Montreal.

St. Bernard, N.S.
Contracts have not yet been awarded for erection of Roman Catholic church here, noted in issue of July 20th. Estimated cost of building, $50,000; architect, R. A. Frechet, Moncton, N.B.

St. John, N.B.
Tenders are out for general renovating of Court House, St. John, which will include electric wiring, painting and general remodelling, etc.

Toronto, Ont.
Inspector Guthrie in his report recommends a new Registry building for this city.

The Board of Control is calling for tenders for the erection of a temporary firehall on the new Wychwood avenue site at St. Clair avenue and Hendrick street. The temporary building will cost $2,200.

Permits were issued to Bathurst Street Methodist Church, two-storey brick Sunday school, $30,000; Danforth Avenue Methodist Church, two-storey brick church, corner Danforth and Jackman, $12,000; Free Masons, for hall, College street, $25,000.

Tenders are being asked by Darling & Pearson, architects, for various trades required in connection with erection or the out-patient department and the emergency hospital in connection with the new general hospital. See advertisement in "Tenders and For Sale Department, of this issue.

Uxbridge, Ont.
The school here was destroyed by fire on the 25th ulto. Estimated loss, $15,000.

Winnipeg, Man.
Tenders addressed to the Chairman, Board of Control, will be received until August 4th for erection of two suburban police stations, etc. Plans with Building Inspector E. H. Rodgers.

AWARDED.

Cadboro Bay, B.C.
The contract for the erection of the new two-room public school was awarded to Ald. W. M. Ross, Victoria, at $2,900.

Dunnville, Ont.
Mr. A. E. Faulkner, contractor, Brantford, has secured the contract for the new collegiate institute here at $35,000.

Edmonton, Alta.
A. B. Ormsby, Limited, Toronto, has been awarded the contract for fireproof doors at new school here.

McHardy & Company, Strathcona, were awarded the contract for the erection of new fire hall at $16,680, with tower, or $14,980 without. Smith, Freeze & Company will do the plumbing at $1,540; and the Freeze Metal Company, supply sheet metal for $520.

Guelph, Ont.
The Sheldon Company, of Galt, have secured the contract for the ventilation of Central School. An electric motor to drive the fans will be used instead of steam exhaust engine.

Montreal, Que.
Messrs. Henry Morgan & Company, Limited, general contractors, 25 Beaver Hall Hill, are carrying out the extensive internal repairs at the Centenary Methodist Church in Point St. Charles.

Messrs. Hutchison, Wood & Miller, architects, Royal Insurance Building, have awarded the general contract for the erection of the First Presbyterian Church, Prince Arthur and Mance streets, to Reid, MacGregor & Reid, general contractors, 688 St. Catherine street west.

North Vancouver, B.C.
The contract for erection of an 8-room school house here has been awarded to Young & Wright, North Vancouver, at $20,000. Hope & Barker, architects, Vancouver.

Newmarket, Ont.
Contract for the high school was let to Mr. McIntosh, of Alexander, Ont., $13,000.

Ottawa, Ont.
Geo. W. King has been awarded the contract for glazing and painting the Rideau Club, at over $5,000. The alterations are to be completed by November 1st. Total cost, $90,000. H. C. Stone and Jas. Mather are architects, and H. C. Hitch, general contractor.

St. Catharines, Ont.
The Martin Electric Supply & Construction Company has the contract for wiring new wing at General and Marine Hospital.

Toronto, Ont.
The contract for the masonry work on the new Earlscourt Public School was finally awarded by the Board of Education to R. Hewitt & Son, at $14,361.

Appliances for steam heating of the Yorkville avenue fire hall will be supplied by Gentle & Travis, at $1,170; and appliances for the heating of the Agnes street police station, will be furnished by Mr. J. E. Gray, at $892.

Wainwright, Alta.
We are informed that the contract for supply and installation of heating plant in 4-roomed school with large basement was awarded to McKnight & Frost, Edmonton, at $2,649. Others tendered as follows:—F. E. Colling, Wainwright, $3,400; J. Lockerbie, Edmonton, $3,161. E. D. Stimpson, architect, Wainwright.

Residences

Hamilton, Ont.
Permit was issued to J. A. Jones, brick dwelling, Eastbourne avenue, $2,500.

Montreal, Que.
Mr. B. J. Perry has purchased property on Fort street, on which, it is reported, he will erect an up-to-date apartment building.

Ottawa, Ont.
Horwood, Taylor & Horwood, architects, are preparing plans for extensive alterations to Mr. Dewar's residence, Wilbrod street.

Tenders wanted at once for excavation and masonry for tenement house corner of Bronson and James streets. Plans at M. C. Eddy's, 71½ Sparks street. Address Box 11, Shawville, Que.

Peterboro, Ont.
W. Blackwell, architect, is calling for tenders until August 4th for erection of residence on Water street.

AWARDED.

Montreal, Que.
Mr. Alex. Shields is erecting two dwellings on Prud'homme avenue, and the contract has been awarded to L. Germain, contractor, St. Joseph street, Verdun.

Montreal, Que.
The contract for the erection of a residence on Cedar avenue for Mr. R. MacFarlane has been awarded to Chas. Thackeray & Company. Messrs. Saxe & Archibald, architects.

Business Buildings and Industrial Plants

Berlin, Ont.
Messrs. Baetz Bros. have offered to rebuild in Berlin, if the town will give them a loan, etc.; the factory to be of solid brick, 60 x 125 feet, four storeys.

Beverley, Man.
The elevator owned by the McCabe Company was destroyed by fire recently. Loss about $25,000.

Bridgeburg, Ont.
The G. T. R. Station at Amigari near here was destroyed by fire on the 28th ulto.

Brownville Junction, N.B.
The C. P. R. repair shops were burned on the 28th ulto. Loss, about $25,000.

Campbellton, N.B.
F. Neil Brodie, architect, of St. John, N.B., is preparing plans and specifications for a warehouse for Messrs. Jones & Schofield.

Mr. Neil Brodie, architect, of St. John, N.B., is preparing plans and specifications for the Bank of New Brunswick, to replace the one destroyed by fire. It will be of pressed brick and cut stone, and will be a purely bank building, having no offices in connection.

Chase, B.C.
The C. P. R. will build an $8,000 station.

Colpoy's Bay, Ont.
Mr. C. E. Whicner's saw mill was burned recently. Loss about $5,000.

Esquimalt, B.C.
It is reported that a Canadian syndicate of eastern capitalists has absorbed the B. F. Graham, Limited, and that they will erect eventually a lumber mill with a total daily output capacity of 250,000 feet.

Golden, B.C.
The Columbia River Lumber Company's saw mill was destroyed by fire on the 20th ulto. Estimated loss, $300,000.

Hamilton, Ont.
Building permit was issued to D. Dick & Son, erection of brick, steel and concrete fireproof building, 100 by 515 feet, one storey (forge building), Hilliard street, East Hamilton, for Oliver Chilled Plow Company, $65,000.

Morse, Sask.
The Hotel Elkhorn, Canadian Bank of Commerce and Imperial Lumber offices are reported destroyed by fire on the 26th ulto. Total estimated loss, $30,000.

Montreal, Que.
Application has been made from a shirt and collar manufacturing firm in Troy, N.Y., for the purpose of erecting a factory in St. Lambert, Que., to employ 400 hands.

Plans and specifications have been prepared and tenders are invited until August 4th for the erection of a five-storey, steel and concrete building, 125 feet by 200 feet in extent, for the Canadian Rubber Company. Messrs. T. Pringle & Son, Limited, architects.

Nanaimo, B.C.
A Vancouver syndicate will erect a brick plant at Nanoose Bay, near here. Proposed expenditure, $40,000. Output of plant, 25,000 bricks per day.

Nelson, B.C.
W. H. Kreyscher, it is stated, is organizing a company to rebuild his mill.

New Liskeard, Ont.
Mr. W. E. Binning, architect, of Listowel, has been commissioned by the Imperial Bank to visit New Liskeard and Cobalt with a view to the erection of bank buildings, there similar to the bank in Listowel.

New Westminster, B.C.
Announcement has been made by A. Barnet, of Renfrew, Ont., that the Barnet-McDonald mill on Lulu Island, which was burned down last winter, would be rebuilt, probably next year.

North Vancouver, B.C.
The Bank of Hamilton have had an engineer taking levels at the southeast corner of First street and Lonsdale avenue, the site for their new building.

Plans prepared by Architect A. J. Henderson for the offices of the Ferry Company were informally approved and instructions issued for further details and specifications to be made ready.

Honeyman & Curtis, Vancouver, B.C., are the architects for the business block being erected for Irwin & Billings Company, Limited, Lonsdale avenue; Smith Bros., North Vancouver, are the contractors. Estimated cost, $9,500.

Portage la Prairie, Man.
Architect C. H. Mounsey has plans for the Hart-Parr plant, which will occupy a ground space of [illegible] by 100 feet, and be of brick.

Prince Albert, Sask.
The plans for the new abattoir for N. H. [illegible] have been completed by Architect Albretchsen, and show designs for a building two storeys high with a large basement.

Quebec, Que.
The contract ratifying the sale of the Champlain market site to the Transcontinental Railway Commission for the construction of the Uunion depot, has been agreed to by Hon. S. N. Parent, Chairman of the Transcontinental Railway Commission, and his worship, Mayor Drouin.

Revelstoke, B.C.
The entire plant and stock of the Revelstoke Lumber Company, at Eddy, two miles from here, was destroyed on the 18th ulto. by fire. Estimated loss, $100,000.

Sandwich, Ont.
A by-law to give the Canadian Salt Company a fixed assessment of $35,000 will probably be submitted to the ratepayers shortly, in return for which the company will erect a large plant.

Saskatoon, Sask.
The Canadian Fairbanks Company is opening a branch here. A large warehouse will be built at once. F. H. Crane, has been appointed manager.

Stratford, Ont.
The by-law to guarantee the bonds of Duftons, Limited, for $12,000 was carried.

Three Rivers, Que.
It is rumored that the Gres Falls Company will establish a large pulp and paper manufactory in this locality in the near future.

Toronto, Ont.
The Fairbanks-Morse Company will build a warehouse on Bloor west.

Curry & Sparling, 90 Yonge street, are calling for tenders until August 10th for erection of fireproof building on Melinda street.

Vancouver, B.C.
Plans have been presented to Inspector Jarrett which cover a three-storey extension to City Hall.

Work has been started on a telephone exchange for the B. C. Telephone Company, at the corner of Tenth avenue and Prince Edward street, by the contractors, McDonald & Wilson. Mr. A. A. Cox is the architect.

Vernon, B.C.
The Board of Trade are in receipt of a letter from C. P. R. Superintendent Kilpatrick, in which he assures them that appropriations will be asked this fall for a new station to cost about $25,000.

Victoria, B.C.
Building permit was issued to Geo. Carter for stores and hall on Courtenay street, $1,650.

It is announced that the G. T. P. has secured options on property to be used as the site for their hotel. W. P. Hinton, Winnipeg, general passenger agent, was in the city the third week in July.

The Colbert Plumbing & Heating Company will commence work immediately on the erection of a two-storey brick and concrete warehouse on the north side of Fort street, between Douglas and Blanchard streets, to cost $8,000.

The British Columbia Sand & Gravel Company, Limited, and the [illegible] Contracting Company, Limited, have amalgamated and will be known as the [illegible] Rock & Gravel Company, Limited. The plants at [illegible] they will be extended, for the purpose of which [illegible] has been [illegible]. Directors, F. W. Jones, Geo. W. Mitchell, H. B. Thomson, M.P.P., etc. Messrs. McPherson & Fullerton, are fiscal agents.

Wardner, B.C.

The establishment of a paper mill here is being discussed. Power would be furnished by the Bull River Electric Company.

Winnipeg, Man.

Tenders are called for material and erection of basement for Downie Bros., 307 McGreevy Building.

It is stated that the Canada Cement Company will build a cement mill here with a capacity of 3,000 barrels per day. F. P. Jones, general manager.

AWARDED.

Montreal, Que.

It is stated that the C. P. R. have awarded contracts for the completion of the new annex to their Windsor street station. The contract for the building was awarded to C. E. Deakin at $1,000,000, and the contract for the structural steel work went to the Dominion Bridge Company at $250,000.

The sub-contract for roofing and sheet metal work on the Kellert Building, St. Catherine and St. Urbain streets, has been awarded to Douglas Bros. Messrs. Peter Lyall & Son, Limited, general contractors. Messrs. Hutchison, Wood & Miller, architects.

General contract for the erection of a two-storey factory building on Parthenais street, for the Montreal Smallwares, Limited, has been awarded to D. G. Loomis & Sons, contractors, Cote St. Paul. Architect, H. C. Stone, 84 St. Francois Xavier street.

Mr. Abel Woolenberg is erecting a two-storey factory at 570 St. Dominique street. General contractor, Joseph Faille, 1144 Wellington street. Architect, C. Dufort, La Patrie Building.

General contract for alterations to store at 416 St. Catherine street west for the Diemel Linen Mesh Company has been awarded to O. LeBeau, contractor, Board of Trade Building. Architects, MacVicar & Heriot, 104 Union avenue.

Mr. Walter Livermore, building superintendent, 72 Anderson street, has awarded the following contracts for the erection of a stable at 29 Ermine street: Masonry and brick, Ward & Baldock; carpentry, H. Tessier; roofing, Campbell, Gilday Company, Limited; plumbing and heating, John A. Gordon; painting and glazing, W. E. Potter & Company; asphalt floors, Geo. W. Reed & Company, Limited.

General contract for the rebuilding of the old Carsley property recently purchased by the Royal Edward Hotel interests, has been awarded to C. E. Deakin, general contractor, 11 St. Sacrament street. Architects, Finley & Spence, 46 Beaver Hall Hill.

The contract for the plumbing and heating of the new store for Messrs. A. E. Rae Company, Limited, St. Catherine, Victoria and University street, has been awarded to The Garth Company, 26 Craig street west. Architect, A. D. Dunlop, Lindsay Building. General contractors, Byers and Anglin, 18 St. Alexis street.

Prince Albert, Sask.

The contract for the new hotel on Thirteenth street has been let to J. Routhier.

Regina, Sask.

The contract for the new building of the Regina foundry has been let to T. Spray, of this city. It will be brick on concrete foundation, 80 feet by 142 feet, with steel truss roof.

Toronto, Ont.

A. B. Ormsby, Limited, were awarded contracts for galvanized iron and slating work at the Parkdale Station; galvanized iron work, roofing and metal windows at the Newell Building, Ontario street, and metal windows at Gooderham & Worts Building.

Welland, Ont.

The contract for Peters' clothing factory has been let to Albert Mason, P. S. Peacock and S. P. Gourlay. Other contracts to be let include roofing, elevators, electrical work, sprinkler system, etc.

Winnipeg, Man.

The contract for erection of McLaren hotel has been awarded to C. W. Sharp & Sons at $175,000. Building to be completed by June 1st, 1911.

The contract for the erection of the Bakery Building, owned by W. R. Milton, this city, has been awarded to the Glengarry Construction Company, Winnipeg; the plumbing, etc., will be done by C. C. Young Company, Winnipeg. Estimated expenditure, $37,300.

Power Plants, Electricity and Telephones

Charlottetown, P.E.I.

Tenders are being asked by W. W. Clarke, city clerk, for the supplying of the city with electric light for street and commercial purposes. See advertisement in "Tenders and For Sale Department" of this issue.

Digby, N.S.

Tenders are being called by Public Works Department, Ottawa, until August 10th for electric light fixtures, wiring, etc., for the public building here. R. C. Desrochers, assistant secretary.

Grand Falls, N.B.

It is stated that the company in which Sir William Van Horne is interested purpose constructing a hydro-electric plant and pulp and paper mills here. Among those interested are, B. B. Kinman and H. McLaughlin, of New York (both members of the Grand Falls Power Company); Jas. Robinson, ex-M.P., of Millerton, N.B.; A. J. Gregory, K.C., of Fredericton, and J. A. Brock, of Montreal.

Matheson, Ont.

It is reported that the provincial government will recommend to the legislature at the next session that a syndicate be given permission to build an electric railway from a point at or near here to the shores of Metagami Lake. It must be started within ten days and finished by the first of January next. R. Shillington, M.P.P., is interested.

Lanark, Ont.

The water power at Playfair will be transmitted to Lanark and used to run the factory of T. B. Caldwell. The capacity is quoted at 500 h.p.

Stratford, Ont.

The by-law to grant privileges to the street railway about to be run in Stratford and vicinity was carried.

St. Catharines, Ont.

The by-law to give the Ontario Power Company, of Niagara Falls, a franchise over the city streets was carried.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until August 9th for pole line supplies, punch and shear concrete mixer, steel bars and crushed stone. Specifications obtained from Hydro-Electric System, City Hall.

Tillsonburg, Ont.

A by-law to raise $25,000 for the purchase, construction and installation of the necessary receiving and distributing buildings and plant in connetcion with power purchased from the Hydro-Electric Commission, will be submitted to the ratepayers on August 23rd.

Vancouver, B.C.

The Western Canada Power Company will call for forty miles of three-eighths inch steel cable for early delivery at once. This will be used for the ground and guy wires of the transmission line now under construction from Stave River falls.

Winnipeg, Man.

The city engineer has been instructed to prepare plans and estimates for a municipal gas plant to be submitted at the next meeting of council.

Weyburn, Sask.

Tenders are asked for electrical machinery by Geo. Ross, secretary-treasurer of the municipality. See advertisement in "Tenders and For Sale Department" of this issue.

AWARDED

Edmonton, Alta.

The contract of supplying steel fastenings for the street railway's new track was awarded to Gorman, Clancey & Grindley, the order given to Drummond & McCall being cancelled owing to that company's inability to supply the material until September. The former company guarantee delivery within three weeks from date of order.

Guelph, Ont.

The following contracts were let by the People's Railway recently: Concrete work between New Hamburg and Guelph, Chas. Robbins, Galt; grading, Berlin to Blooming, McMillan & Company, Berlin to New Hamburg, O'Brien Construction Company.

Regina, Sask.

The following list of successful tenderers for telephone exchanges in the Province of Saskatchewan, has been forwarded to us: Scott—F. Somerville, Box 32, Regina, $1,810; Humboldt—Simpson & Craig, Virden, Man., $1,938; Vonda—Simpson & Craig, Virden, Man., $1,800; Davidson—Simpson & Craig, Virden, Man., $1,850; Outlook—Stanley L. Ross, Regina, Sask., $1,870; Broadview—Stanley L. Ross, Regina, Sask., $1,970; Whitewood—Stanley L. Ross, Regina, Sask., $2,123; Carlyle—Stanley L. Ross, Regina, Sask., $1,990. Letting of the contract for the construction of Watrous and Craik exchanges has for a time been deferred.

St. Hyacinthe, Que.

Contract for installation of gas pumping engines and street lighting system for town of St. Hyacinthe, has been awarded to the Colonial Engineering Company, Limited, of Montreal. Contract price, about $54,000.

Miscellaneous

Toronto, Ont.

The following building permits were issued by the City Architect from July 16th to July 23rd: J. H. Shales, 1 pair semi-detached 2½-storey brick dwellings, 22-24 Dearbourne, $5,000; E. A. Kantel, 1-storey brick warehouse, 189 Church, $6,000; A. A. Wright, 2½-storey brick and stone dwelling, on Warren road, $16,000; W. J. O'Reilly, 8 attached 2½-storey brick and stone dwellings, Dundas street, $24,000; A. B. Coleman, 3-storey brick and stone apartment house, Nanton avenue, $8,000; Harris Abattoir, 3-storey steel and wood store and cold storage building at St. Lawrence market, $7,000; Frank Britton, 1 pair 2-storey brick dwellings, Greenwood avenue, $7,000; Meismiller and MacKenzie Bros., 1 pair semi-detached 2-storey brick dwellings, on north side, Pearson avenue, $5,000; J. A. Simmers, 4-storey brick office and warehouse, King street east, $11,000; J. Brodie, 1 pair semi-detached 2½-storey brick dwellings, Pape avenue, $6,000; Wm. Rankin, 3 attached 3-storey brick and stone stores and dwellings, north side of Dundas, $10,000; Love Bros., 2 detached, 2½-storey brick and concrete dwellings, 24 Fairview avenue, $5,000; R. J. Beamish, 2½-storey brick and stone dwelling, Roxborough, $6,000; Wm. Pendleton, 2 pair 2-storey roughcast dwellings, brick fronts, east side of Greenwood avenue, $6,000; A. E. Osler, 2½-storey brick and stone dwelling, on Summerhill Gardens, $6,000; H. H. Williams, 2-storey brick office, 36 King street east, $5,000; H. Blake, 2-storey brick and stone addition to Clarendon avenue, $25,000; W. J. Dempster, 3 attached, 2-storey brick dwellings, Perth avenue, $6,000; Shurly & Derritt, 2-storey brick addition to factory on west side Bartlett avenue, $5,200; A. Duff, 2 pair semi-detached 2-storey brick dwellings, south side Columbus, $6,000.

Vancouver, B.C.

Recent building permits include: S. McLellan, 1115 Lilly street, $2,700; Kwang Chong, Pender street east ,$15,000; Jefferson & Clapham, 2475 Sixth avenue west, $2,700; A. S. Bain, 1656 Eleventh avenue, $2,600; J. Rodway, Park Drive, $10,000; G. P. Ballentine, 1146 Eleventh avenue west, $3,000; R. Leigh Spencer, 2326 York street, $5,500; S. Hovick, 685 Eleventh avenue west, $6,900; W. G. McIntosh, 636 Eighth avenue east, $3,500; W. A. Stephens, 1456 Tenth avenue east, $2,500; L. C. Kyle, 2446 Third avenue, $3,000; Kitsalano Methodist Church parsonage, 2526 Second avenue west, $3,500; F. Burdis, 1818 Barnard street, $2,800; W. H. Gallagher, stable, 1068 Hornby street, $6,000; Vancouver Trust Company, 614 Pender street, $10,000; P. Agren, 1324 Comox street, $3,500; Mrs. E. G. Donogher, 1138 Burnaby street, $4,000.

Winnipeg, Man.

The Board of Control are calling for tenders until August 25th for supply of machinery capable of boring holes in the limestone, etc. M. Peterson, secretary.

Recent building permits include:: Duncan & McDonald, dwelling, north side of Yale avenue, $6,400; J. F. Scribner, dwelling, Horne street, $2,500; J. C. Hicks, dwelling, north side of McMillan avenue, $4,000; Dunn & Wallace, dwelling, south side of Kingsway, $6,500; Canadian Bag Company, alterations, 831 Henry avenue, $6,000; John A Saul, dwelling, garage and stable, south side of Harvard, $4,200; M. Simmons, two houses, north side of Bannerman, $4,000; J. E. Parker, west side of Young, $3,000; H. McKenzie, house, east side Raglin road, $2,500; F. H. Martin, dwelling, west side of Lenore street, $4,500; A. G. Davidson, dwelling, north side Beresford avenue, $2,500; J. C. McNabb, dwelling, west side of Horne street, $2,800; C. H. Fox, dwelling, south side of Cathedral avenue, $3,000; John Crichton, dwelling, south side of Grosvenor avenue, $5,000; A. McDonald, dwelling, south side of Arnold avenue, $3,000; J. Isenberg, three dwellings, south side of Mulvey avenue, $7,500.

Garean Motor Car Company, Limited, Montreal, Que., capital $300,000. Incorporators, Julien Therrien and Napoleon Girous, merchants, both of Montreal.

CONCRETE PILES.

The subject of concrete piles was taken up in considerable detail in the report of the committee on masonry presented at the recent annual meeting of the American Railroad Engineering and Maintenance of Way Association. The principal argument to be advanced against this form of piling, according to the report, is its cost. This, however, is more apparent than real, as the report goes on to point out. The cost per lineal foot is certainly greater for a concrete pile; but when the saving in excavation, the size of footings, number of piles and time of completion are taken into consideration, the additional cost per foot is discounted. Generally when these items are taken into consideration the report says they show a decided advantage in favor of concrete piles.

Wooden piles are loaded to about 15 tons and while many engineers think they are capable of carrying greater loads, this load represents conservative practice. The loads allowed on concrete piles vary from 25 to 50 tons each, depending upon the nature of the ground, and the systems used; in European practice they are loaded to 40 or 50 tons each, and there are records of piles loaded to 80 tons. The best American practice, however, limits the load to 35 tons.

To prevent decay, wooden piles are cut off at low water and the foundations must be carried down to this level. The tops of concrete piles may be at any elevation desired and the depth of the footing course will be governed by the spacing of the piles, and the weight of the superstructure. In this way the expensive excavation for deep footings, as well as the cost of the additional depth of footings, is saved.

Concrete piles cannot be driven as rapidly as wooden piles, but since the load per pile is greater, their use may result in a saving of both time and cost. If concrete piles are used no delay is occasioned by waiting for the arrival of the piles; wooden piles are difficult to obtain in certain parts of the country, but sand, stone and cement are generally available. There is no reason why concrete should vary in quality, while it is becoming more and more difficult to obtain wooden piles of a standard grade.

A wooden pile rots if alternately wet and dry and is subject to attack by the teredo and other wood borers, when placed in salt water. The elevation of ground water fixes the point of cut-off, but the building of deeper sewers in the neighborhood may lower the ground-water level, and when this occurs wooden piles are subject to decay.

RAPID STEEL ERECTION IN CHICAGO.

Rapid structural steel erection was accomplished between March 1st and April 15th on the second section of the 20-storey, 170 x 190-foot Peoples' Gas Light & Coke Company's building at the corner of Adams street and Michigan avenue, Chicago. The company wished to remain in the five-storey building which stood on the site of the second section until the first section was ready for occupancy. This old building was, therefore, shored up and the foundations of the new building constructed under the old structure. By February 28th, the old building had been wrecked and cleared away and the foundation completed ready for the steel work. On March 1st, the first steel columns were put in place, and on April 15th the last of the steel had been erected.

The steel was handled from the wagons in the street to its place in the building by two stiff-leg derricks equipped with 80-foot steel booms. The derricks were set on the roof of that part of the building already completed, and the hoisting engines on the first floor. The second section is 52 feet wide by 170 feet long, so that the 80-foot booms covered the whole area and both streets.

A total of 3,640 tons of steel was erected and riveted in 36 eight-hour working days, an average of over 50 tons per day for each drrick. Four teams were employed in hauling the steel from the unloading crane in the Randolph street freight yards to the site of the building, a distance of about one-half mile. There was a total force of 80 men employed in the work of steel erection, exclusive of teamsters.

MASONRY ARCH.

A long-span masonry arch has recently been completed on the Bellegarde-Chizery Railway in France, from the plans of Chief Engineer Picard, which is interesting not only on account of the long span, but also the method of construction. The main arch is 262 feet 9½ inches long and springs from one side to the other of a rocky gorge 215 feet deep at the elevation of the structure. The arch is 4 feet 11 inches thick at the crown and 8 feet 2 inches at the springing lines. The main arch carries eleven spandrel arches supporting the roadway. In order to construct this arch three timber towers 133 feet high were first erected and then a system of braced centering was built out from them, the whole calling for nearly 22,000 cubic feet of timber and about 30 tons of steel. According to the "Builder," no settlement was noticed when the arch was struck, but this is hardly surprising because special provision had been taken to avoid any such settlement by constructing tne main arch in eight sections, finally connected by closing voussoirs. The total cost of this structure is given as only about $90,000.

OIL-MIXED CONCRETE AND STUCCO.

Recent experiments in the mixing of mineral oil with concrete appear to have yielded very encouraging results. The oil, alkalis and water form an emulsion, becoming thoroughly incorporated in the concrete. If the concrete is to be mixed by hand, proceed as usual, and, after the water has been added and the resulting mass turned and raked, add non-volatile mineral oil, in the proportion of 10 to 15 per cent. of oil to the weight of the cement. Turn the concrete with shovels two or three times, raking while turning. If this is properly done, the oil will quickly emulsify and become thoroughly mixed in the concrete. If a mixing machine is employed, use a batch-mixer, turning a sufficient number of times to thoroughly mix the cement, sand, crushed stone, or gravel and water. Then add 10 to 15 per cent. of none volatile mineral oil. Turn again the same number of times as it requires to mix the concrete.

Again, there are special advantages with regard to stucco and exterior plasters. The following specification for stucco is suggested: One part portland cement, 20 per cent. (volume of cement) of hydrated lime, three parts coarse white sand. Dry mix the sand and cement, and with these mix dry hydrated lime, turning each three times with shovels; rake while shovelling. Add water, turning and raking until the desired consistency is obtained. Then add 15 to 20 per cent. of white oil petrol, the oil to be by weight in percentage to the weight of the cement. If it is desirable to tint the stucco, colour the oil with any limeproof coloring matter in proportion which by experiment with small samples is necessary to give the desired tint.—Building World.

Tenders and For Sale Department

FOR SALE

Kelly Steam Pump Horizontal Cross Compound, in good condition, capacity 2,000,000 imperial gallons, must be removed to make room for electric equipment. Inquire the Water Commissioners, London, Ontario. 31

Town of Oshawa

Tenders are called for the construction of 4,000 lineal feet of First Class Heavy Macadam Pavement, 43 feet wide, on King Street and Simcoe Street, and 2,500 feet of Light Macadam, 32 feet wide, on Simcoe Street.

These will be received up till noon of the 18TH DAY OF AUGUST, 1910, at the office of the Town Engineer of Oshawa.

Specifications and forms of tender will be sent on application, and all applications must be made on the forms provided.

Plans and specifications may be seen at the office of the Town Engineer. The lowest or any tender not necessarily accepted.

FRANK CHAPPEL,
Town Engineer.
32

City of Moose Jaw

Saskatchewan

Sealed tenders will be reecived by the undersigned City Clerk until 8.30 o'clock p.m. on MONDAY, AUGUST 15TH, 1910.

Supply materials for and constructing approximately:

63,000 square feet of Concrete Walks.
9,000 lineal feet of combined Curb and Gutter.
6,000 square feet of Concrete Crossings.
6 miles of Wooden Walks.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, Sask., July 28th, 1910. 32

Reinforced

Concrete Viaduct

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, AUGUST 9TH, 1910, for the construction of a reinforced concrete viaduct of beam and slab construction on the Weston Road, in the City of Toronto, containing the following approximate quantities:

Excavation—1,068 cubic yards.
Concrete (retaining walls)—472 cubic yards.
Concrete (viaduct)—577 cubic yards.
Reinforcing steel—126,000 pounds,
Also Pipe Railing, Waterproofing, etc.

Plans and specifications may be seen and forms of tender obtained at the office of the Bridge Department, City Hall, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer), not members of the City Council, or officers of the Corporation of the City of Toronto, or in lieu of said sureties, the bond of a Guarantee Company approved of as aforesaid.

The usual conditions relating to tendering as prescribed by the city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman of Board of Control.

City Hall ,Toronto, July 22, 1910. 31

Tenders

Toronto General Hospital College Street

Tenders addressed to the Chairman of the Building Committee will be received by the undersigned up till noon

Monday, August 15th, 1910

for all the various trades required in the erection and completion of buildings for the Out-Patient Department and the Emergency Hospital in connection with the General Hospital.

Plans and specifications and all other information may be obtained at the office of the architects.

The lowest or any other tender not necessarily accepted.

DARLING & PEARSON,
32 2 Leader Lane, Toronto.
accepted. 32

City of Winnipeg Electrical Distribution System

Tenders for

Underground Cable

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope "City of Winnipeg Electrical Distribution System, Tender for Cable," will be received at the office of the undersigned up to noon on THURSDAY, SEPTEMBER 1ST, 1910, for the manufacture, delivery and installation, 46,000 feet of thirteen thousand volt, three-core cable.

Copies of the specifications and form of tender may be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg.

These specifications may also be examined at the offices of Messrs. Smith, Kerry and Chace, Confederation Life Building, Toronto, Ontario.

Each tender must be accompanied by a certified cheque for one thousand dollars, which cheque will become forfeit to the corporation in the event of the successful tenderer refusing or neglecting to sign a satisfactory contract when called upon so to do.

The city reserves the right to reject any or all tenders or to accept any bid which shall appear advantageous.

M. PETERSON.
Secretary.

Board of Control Office,
Winnipeg, July 15th, 1910. 31

Steel Viaduct

on Queen Street East

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon, on TUESDAY, SEPTEMBER 6TH, 1910, for the construction of a steel viaduct on Queen street in the City of Toronto, crossing over the River Don, and the roadways on each side, and over the tracks of the Canadian Pacific, Canadian Northern ,and Grand Trunk Railways, including the following approximate quantities:

Excavation (ordinary)—5,400 yards.
Excavation (trenches)—2,300 yards.
Filling—24,000 yards.
Concrete reinforced walls and footings—1,570 yards.
Concrete reinforced floor slab—880 yards.
Piling concrete—10,400 lineal feet.
Steel reinforcing rods—113 tons.
Reinforcing fabric—20,000 square feet.
Structural Steel—752 tons.
Paving (wood block)—3,010 square yards.
Paving (macadam)—9,000 square yards.
Also Railing, Waterproofing, etc.

Plans and specifications may be seen, and forms of tender obtained at the office of Bridge Department, City Hall, Toronto, or may be seen at office of "Contract Record," B34, Board of Trade Building, Montreal, Que.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer) not members of the City Council, or officers of the Corporation of the City of Toronto, or in lieu of said sureties, the bond of a guarantee company approved of, as aforesaid.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, July 22nd, 1910. 32

Tenders

for

Electric Lighting

Sealed tenders addressed to the undersigned and marked "Tenders for Electric Lighting" will be received at the office of the City Clerk, Charlottetown, Prince Edward Island, until 12 o'clock noon on SATURDAY, THE 10TH DAY OF SEPTEMBER, 1910, for supplying the City of Charlottetown with Electric Light for Street and Commercial purposes. Tenders to state price and illuminating capacity per lamp for street light, and rate per kilowatt hour for commercial lighting.

The lowest or any tender not necessarily accepted.

Further information can be obtained by applying to

W. W. CLARKE,
City Clerk.

Charlottetown, P.E.I., July 20th, 1910. 34

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 inch x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

CONTRACTOR'S OUTFIT FOR SALE—Six Wheeler, No. 3, concrete line plant, nearly new. Owner going into another line of business. Joseph Patterson, Box 114, St. Marys, Ontario. 35

City of Moose Jaw

Saskatchewan

Sealed tenders will be received by the undersigned City Clerk until 8.30 o'clock p.m. on MONDAY, AUGUST 15TH, 1910.

Supplying materials for and laying 3286 lineal feet of 6-inch and 700 lineal feet of 12-inch Cast Iron Water Main.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw, and also at the office of the Canadian Engineer, Winnipeg.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, Sask., July 16th, 1910. 32

Town of Weyburn

Province of Saskatchewan

Sealed tenders (marked, Tender for Electrical Machinery) will be received by the Secretary-Treasurer of the Town of Weyburn until 5 p.m. on TUESDAY, AUGUST 9TH, 1910, for the following Electric Lighting Equipment:

One Cross Compound Engine.

Condenser, Feed Water Heater and Piping.

One 250 k.w. Alternating Current Generator with Exciter Switchboard, etc.

An accepted cheque for $500.00 must accompany each tender.

The lowest or any tender not necessarily accepted.

GEO. REED, Superintendent.
GEO. ROSS, Secretary-Treasurer.
31

Tenders
for
Sewers and Sidewalks

Township of York

Sealed tenders plainly marked on the outside as to contents will be received by the undersigned up to twelve o'clock noon of MONDAY, AUGUST 15TH, 1910, for the construction of the following works in the Township of York:

982 feet Vitrified Pipe Sewer on Spadina Road northerly from the city limits;

592 feet Vitrified Pipe Sewer on Walmer Road northerly from city limits .

986 feet Granolithic Sidewalk on Markham Street, northerly from the city limits.

Separate tenders will be required for the works named, but bidders may tender on any one or all of the three.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, 57 Adelaide Street East, Toronto.

The lowest or any tender will not necessarily be accepted.

BARBER & YOUNG,
York Township Engineers.
32

WATERPROOFING EXTERIOR OF CEMENT WALLS.

C. F. L., Waterville, Me., has a house built of concrete blocks and desires to coat the exterior of the walls with a waterproofing solution that will not change the color of the blocks. Desires advice as to the proper material.

Answer: We believe the best method is to apply a first coat or wash of equal parts by weight of zinc sulphate and water in solution, which is best applied with a paint spraying machine. This will, to some extent, stop the suction in the cement and make it much more resisting to water, hardening the surface also. But it alone will not make it impervious to moisture. A coat of sodium silicate (waterglass, soluble glass), which can be bought in liquid form in the consistency of syrup and is made more liquid by the addition of clear water, is applied with a paint spraying machine, and will effectively stop moisture from entering into the cement. Try it on a cement block first before going over all, and if one coat of waterglass will not answer apply a second one . Dilute silicate of soda of 33 degrees Be. to a consistency that will work well in the spray and see that the coating is applied uniformly. The work should be done in dry weather and in a temperature not below 50 degrees F., allowing at least 48 hours between the application of the zinc sulphate wash and the application of the first coat of waterglass. If a second coat of the later is found necessary it can be applied as soon as the first has well set, but it is best to give twenty-four hours between coats. If the concrete blocks have been prepared originally with a solution of zinc sulphate, as is often the case, the zinc sulphate wash can be dispensed with and the waterglass alone will be sufficient to keep out moisture. You can probably ascertain this from the manufacturer of the cement blocks.

CAUSE OF FLOOR PAINT SHRIVELLING ON DRYING.

A. L., Minnesota, sends us a piece of glass showing how paint, which he describes as being composed of lead, zinc, coloring matter, oils, turps and driers, shrivelled when applied as the seconde oat on a hard pine floor. He says that the temperature of the room was 80 dgerees F. all the time and the first coat was hard and had an eggshell gloss. The paint was mixed in a cold room, however, and the materials were all cold when paint was mixed and taken to the job and applied immediately in a temperature of 80 degrees F., as before stated.

Answer: While the change of temperature may have had something to do with the action of the coat, we believe the trouble to be due to fatty oil, which may have been used in thinning the lead, zinc and coloring matter, or the coloring matter, which we take to have been yellow ocher and drop black ground in oil. may have stood exposed and become fatty. Paint of such character will act that way.

A DEFINITION OF ENGINEERING.

The best known and probably most generally accepted definition of engineering is that given in 1828 by Tredgold, and embodied in the application of the Institution of Civil Engineers of Great Britain for a charter. It describes the profession of an engineer as "the art of directing the great sources of power in nature for the use and convenience of man." Tredgold then went on to specify some of the branches of the profession and concluded with the prediction that the extent of the profession was limited only by the progress of science and that its scope and utility would be increased with every discovery in philosophy and its resources with every invention in the mechanical or chemical arts. The definition was formulated at the time when the minds of engineers were principally occupied with the new discoveries relating to power, such as the steam engine, the steam boat and the steam locomotive. Hence the emphasizing of power in the definition. A year or so Mr. Henry G. Scott, in his address as President of the American Institute of Electrical Engineers, proposed the following as an improvement of Tredgold's definition: "Engineering is the art of organizing and directing men, and of controlling the forces and materials of nature for the benefit of the human race." Another definition of engineering was given last year by Professor G. F. Swain in an address at the Worcester Polytechnic Institute. Professor Swain's definition was as follows: "Engineering is the science and art of applying, economically, the laws, forces and materials of nature for the use, convenience or enjoyment of man."

"THE HOME BEAUTIFUL."

Much has been written about The Home Beautiful—but nearly all of it has had to do with the interior of the home, yet a cosy, comfortable home must have the exterior well-kept and this requires ornamental wire fence, guards and accessories. The surroundings of the home should be treated in an artistic manner. Well-kept lawns and flower-beds about the house, enclosed by attractive ornamental wire fences will present a scene quite irresistible.

The Crowley Fence Company, 1516 Hennepin avenue, Minneapolis, makes a specialty of ornamental iron and wire fencing for lawns, gardens, cemeteries, public grounds, etc.

This is a subject well worth the attention of house owners. It enables a finish and a protection to the grounds which is not available otherwise.

The B. C. Gazette gives notice of the incorporation of the following companies:—Prudential Builders, Limited, capital $100,000; Producers' Rock & Gravel Company, Limited, capital $350,000; The Anvil Island Brick Company, Limited, capital $100,000; British Columbia Electrical Hot-Water Supply Company, Limited, capital $25,000; Dominion Sawmills and Lumber, Limited, capital $5,000,000; The Bagnall Box Factory, Limited, capital $10,000; The Wood Lake Water Company, Limited, capital $50,000; Pacific Lime Company, Limited, capital $100,000, incorporated to carry on business as dealers in lime, cement, concrete and building materials of all kinds; Burrard Sash & Door Factory, Limited, capital $20,000; Western Construction Company, Limited, capital $25,000; American Timber Holding Company, capital $6,000,000; Rupert Marine Iron-works & Supply Company, Limited, capital $25,000; Newport Timber Company, Limited, capital, $400,000; British Columbia Log Brokerage Company, Limited, capital $100,000; The Pyramid Asphalt & Oil Company of British Columbia, Limited, capital $75,000; Cranbrook Sash & Door Company, Limited, capital $100,000; Moosejaw Electric Railway Company, Limited, capital $400,000; The Tulameen Power Company, Limited, capital $10,000; Portland Canal Lumber Company, Limited, capital $50,000; Vancouver Midway Oil Company, Limited, capital $600,000 ,incorporated to construct, control, etc., electric lighting and power works; Dominion Motor Car Company, Limited, capital $50,000; Canadian Door-Hanger Manufacturing Company, Limited, capital $10,000; Quain Electrical Supply Company, Limited, capital [illegible] West Light Company, Limited, capital $10,000; Munson Lumber Company, Limited, capital $350,0000; The Enterprise Power & Irrigation Company, Limited, capital $10,000; Finnish Building Company, Limited, capital $5,000; The Fort George Water & Light Company, Limited, capital [illegible]; Newport Timber Company, Limited, capital [illegible]; The [illegible] Building Company, Limited, capital $250,000; [illegible] Company, Limited, capital $250,000.

Good Roads for Toronto Suburbs

The city of Toronto and the county of York at last seem to have come to an agreement in regard to the improvement of the principal roads radiating from the city. The meeting of representatives was held at Cooksville on July 27th, at which Controller Ward presided and at which after a lengthy discussion it was decided that the city should pay one-third, the county one-third and the government of the province one-third toward the reconstruction of the main thoroughfares leading out of Toronto, for an average of about 20 miles, covering 7 roads, and comprising in the neighborhood of 120 miles. It was the general consensus of opinion at the meeting that the government of the province should take charge of the good roads movement, have their engineers lay out the work, submit it to the municipalities for approval and co-operation, and either through their own public works department or through the good roads commission, take charge of the work and look after the subsequent maintenance of the roads. Others represented at the meeting were the Toronto Board of Trade and the Guild of Civic Arts. The resolution which was finally passed was introduced by Reeve W. H. Pugsley, of Richmond Hill, who has been an active advocate of the good roads policy for some years past.

The next step will be a meeting of the York County Council, to be followed by a conference on August 9th, of the city and county authorities, at which it is expected also that Hon. Dr. Reaume, Provincial Minister of Public Works and his deputy, Mr. W. A. McLean, will be present. At this meeting it is expected that negotiations will reach a stage which will enable application to be made to the legislature at its next session for power to issue debentures for the work. Mr. Lionel H. Clark, ex-chairman of the Board of Trade's good roads committee, estimates that $500,000 will be sufficient for present purposes.

The Ontario Government's share is fixed under the good roads act, whereby the government undertakes to contribute one-third of the cost of any plan of roadway improvement decided upon by the municipalities. The roads to be improved if the plan is carried out are the following: Lake Shore, Dundas, Weston, North Yonge street, Don Mills, Kingston, Danforth and Kennedy,

---

The city of Toronto finds that although it is laying 1,500 feet of water pipe every day and using the output of two pipe foundries it cannot supply more than 50 per cent. of the demand for new water mains. The contractors are employing about 150 men at pipe laying and they are hampered by lack of pipes.

The Board of Control of the city of Toronto have found out by experience that they are unable to enforce the penalty clause on their contracts, no matter how much behind the contractor may be with his work, unless it can be proved that the city actually suffers damage by reason of the delay. It is impossible in the majority of cases to prove any such damage and the penalty clause is therefore not worth much. The Board of Control has therefore instructed the City Solicitor to report on a proposed grading of the pay of contract work, which would have a similar effect to the enforcing of a penalty for delay.

The C.P.R. in British Columbia

We are informed that estimated expenditures by the C.P.R. for repairs during the present year in the Nelson district, exclusive of the Proctor hotel project, will aggregate $1,080,000. Some three hundred miles of railroad will be built; several new steel bridges are under construction; 70 miles of road will be laid with the 85-pound steel rails; wooden bridges will be filled in, retaining walls of stone masonry built; 60 miles of track ballasting done; a brick roundhouse built at Smelter Junction and a multitude of smaller jobs handled. Between 500 and 600 laborers are now at work at the various points and within a few weeks almost as many more will be engaged.

A survey of the work which the C.P.R. is doing in Southern British Columbia sustains the belief that the railway authorities are decidedly optimistic as to future development work in the district mentioned. Probably no other territory in North America produces more business, freight tonnage and passenger traffic and more railroad revenue per capita of population. According to a census recently taken by the railway officers, the population in the district between Kootenay Landing and Midway, south of the main line, does not exceed 30,000 in number, and the expenditure of so large a sum in one year for railroad improvements points to a volume of production highly creditable to the province.

Steel rails weighing 85 pounds per foot, the heaviest rails used, are expected to arrive from the east the latter part of the present month, and the work of laying them in place will start at once. These new rails will be used on the Phoenix-Eholt branch to Greenwood, Castlegar, Smelter Junction, from Castlegar westward for ten miles, Nelson to Shore Acres, and on the Granby spur from Grand Forks to the smelters. It is estimated that the cost of laying these new rails will be $2,600 per mile and for the total of 70 miles this item alone amounts to $182,000.

One of the biggest bridge building jobs on hand is that of Cascade, where a wooden structure is being replaced by a steel one on stone masonry piers of nearly 3,000 cubic yards. It will be 100 feet above the water, and will consist of two spans of 130 feet, two of 100 feet and two of 40 feet. The railway company is doing the masonry work. This bridge will cost the railway company $115,000.

Twelve miles north of Cascade work has started on another steel bridge of 130 feet, single span. Men are now engaged on the foundation. An 80-foot span will be put in on the Lardo branch, but the remainder of the cut will be filled with gravel and stone. A number of important operations are on hand in the filling in of old wooden bridges. Men are at work at Fisherman, between Grand Forks and Eholt, where 160,000 cubic yards of earth will be required to fill in a bridge. Instead of building a masonry culvert, the railway at this point is driving an 8-foot tunnel through the rock for 400 feet to carry off the water.

East of Farron, on Porcupine Creek, 700,000 cubic yards of material will be required to fill in the wooden bridge, and it will take three years to complete the job. At present the work is confined to building a hydraulic plant by which method the work will be done. Actual filling at this point can not commence before next year, an 8-foot stone arch culvert 520 feet long being necessary first. The cost of this improvement is estimated at $150,000. Other filling jobs on hand include one south of Robson of 80,000 cubic yards, one on the Phoenix branch of 50,000 yards, and one of the Nakusp line, totalling 180,000 yards. Economy prompts the filling in of wooden bridges. They require constant watching and yearly repairs. When once filled in they are permanent and entail no further expense.

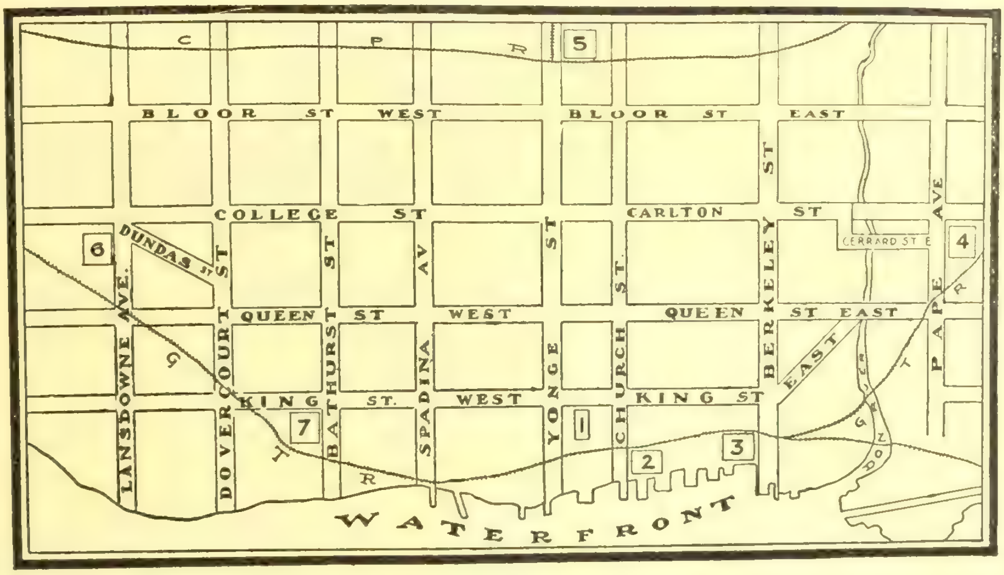
In the Boundary district 40 miles of ballasting work is under way and half done. This the railway company estimates costs $1,000 per mile. Four retaining walls are under construction between Nelson and Cascade, and at Smelter Junction work is started on a fine five-stall brick roundhouse, to cost $22,000.

The strike of the Builders' and Laborers' Union at Toronto which has been in progress for six weeks has been concluded. The wages secured by members of the union are now from 28 cents an hour up. The settlement of the strike was largely in the nature of a compromise, as some of the builders had granted the advanced wages and others had not.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone Main 4155 No's 2, 4, 5, 6



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

CONTRACTORS' PLANT

BOILERS

PUMPS

TANKS

CONDENSERS

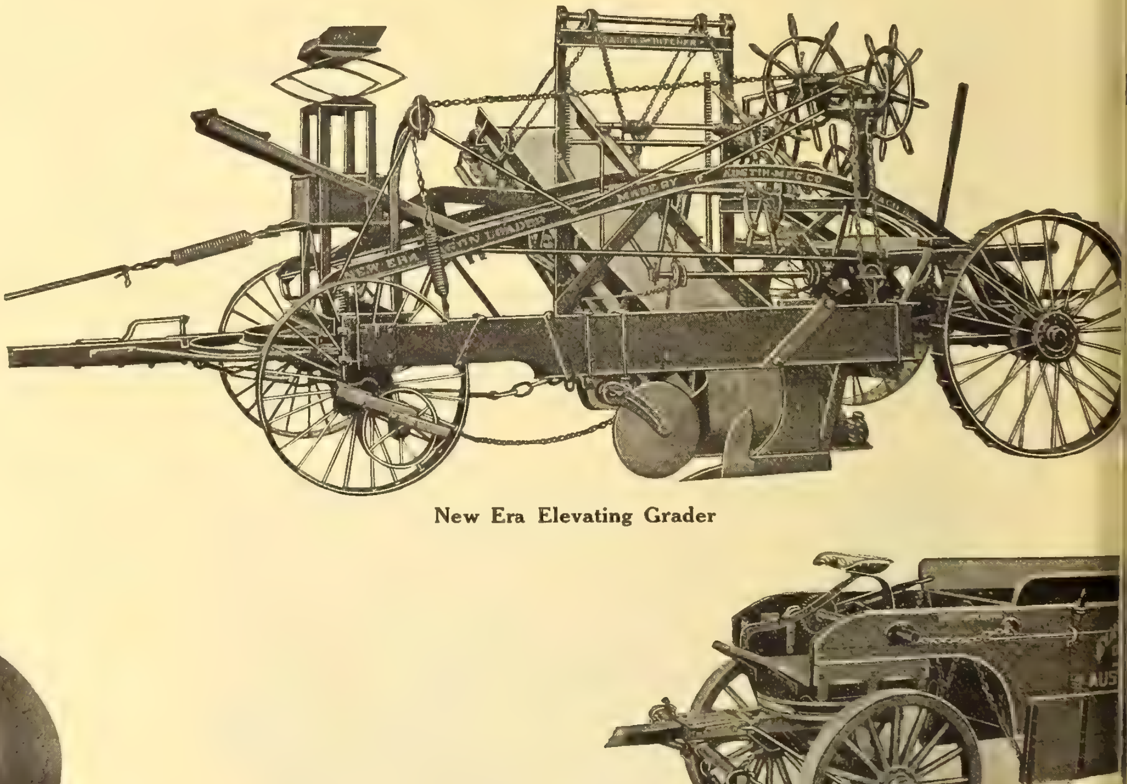
WORKS: MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

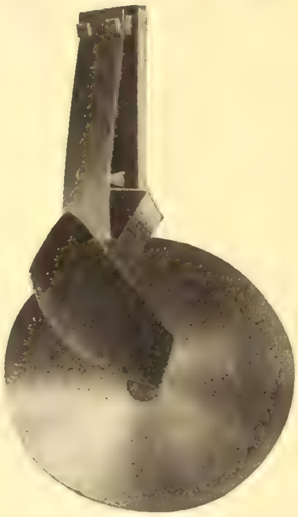
Limited

Elevating Graders

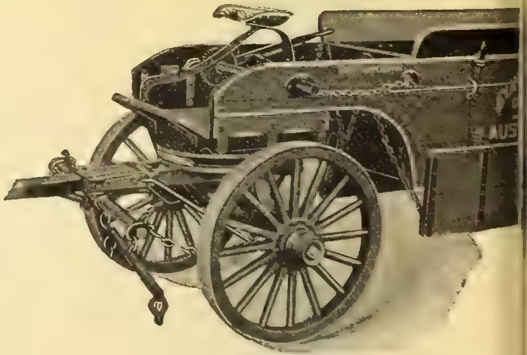
for Railroad Grading, Irrigation Work, Municipa Road Building, Etc.



New Era Elevating Grader



Disc Plow Attachment



Austin Dump Wagon

Head Offices and Warehouses :

Montreal

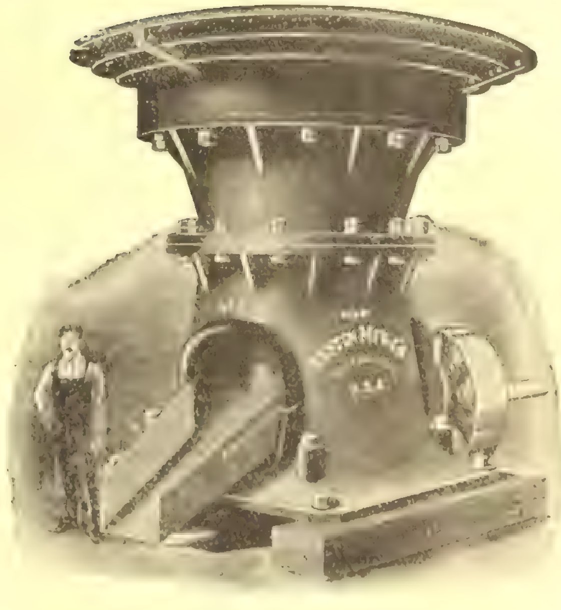
MUSSEN

mplete
Rock
Crushing
Plants

igned and Supplied

- Crushers
- Elevators
- Screens
- Bins
- Hoists
- Derricks
- Rock Drills
- Drill Steel
- Cars
- Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co. LIMITED
Hamilton - Canada

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R. R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto August 3, 1910 No. 31

The Ontario Government House Plans

An interesting situation has developed in connection with the competition which the Public Works Department of Ontario has inaugurated for plans for the new Lieutenant-Governor's residence to be erected in Toronto. Briefly, the trouble amounts to a disagreement between the Department and the architects, the latter being represented by the Royal Architectural Institute of Canada, and the Ontario Association of Architects. Competitions for plans have always been a fruitful source of trouble and it was with a view to preventing trouble as much as possible that the architects of the country through their various associations, adopted certain professional codes of ethics, to guide them in their work. An important feature of these codes relates to competitions. Clause nine of the code of ethics of the Royal Architectural Institute of Canada is as follows: No member shall furnish designs in competition for private work or for public work, unless an advisor, previously appointed, satisfactory to the competitors is employed to draw up the conditions and assist in the award. In the competition under consideration this requirement has not been complied with. Furthermore, the competitors were given no guarantee that the winner would be given the commission of superintending the work. Still another cause of complaint from the architects was that the time given for submission of plans for considered inadequate. This objection has been removed, however, by the doubling of the time.

A number of architects interviewed the Minister of Public Works recently and submitted their objections. The only result was the increase granted in the time. The result now is that the Royal Architectural Institute and the Ontario Association of Architects have advised their members to refrain from taking part.

It is regrettable, in connection with so important a work, that such a situation should have developed. The architects are well within their rights in refusing to participate in the competition. Their code of ethics is based upon a desire to improve the standard of architecture and the clause at issue is based largely upon a desire to avoid those difficulties which have so often occurred, when the plans of competitors have been exploited by unscrupulous people, or the details of the competition have been so arranged as to be fruitful of misunderstanding. No architect cares, any more than a contractor, to compete for work unless he knows that the conditions are practical and that the successful competitor will secure the work. The prize or honor of securing first place are quite secondary to the actual business advantage of superintending the work. Those who fail to secure the prize, moreover, very naturally have reason to fell incensed if they discover that their efforts have been expended in an enterprise which was certain to have been comparatively fruitless.

From the Government's side of the case there may be some reason for feeling that they know their own business better than others and that the proper parties to draw up the competition details are the Minister of Public Works and his staff. There is another side to the matter, however, inasmuch as the public supplies the money and has to look at the building after completion. The public's interest can probably be best assured by giving the architects their own way so far as the competition is concerned. Moreover, if the Government persists in refusing to carry out the wishes of the architects they will lay themselves open to the very natural suspicion, that some favored architect has been selected to whom the work is to be given and that the competition is merely being used as a blind. In the interests of architecture and of the Government's good name a change should be made in accordance with the suggestions of the architectural associations.

Tarred with the Same Stick

Who shall doubt the secret hid
Under Cheop's pyramid
Was that the contractor did
  Cheops out of several millions?
Or that Joseph's sudden rise
To Comptroller of Supplies
Was a fraud of monstrous size
  On King Pharaoh's swart civilians?—Kipling.

In a recent advertisement for tenders for paving work, the town of Sarnia stipulated that the contractors and laborers must be ratepayers of the town. This appears to be limiting contract work to a very limited sphere in that locality, but after all it is only what a section of the community is fighting for at Toronto.

Design and Construction of Bowled Floors

Discussion of Problems Arising in an Interesting Type of Building—What is the Best Pitch—The Proper Treatment of Levels

The design and construction of slanting floors for audience rooms, in churches, theatres, etc., is a matter which requires perhaps as much careful attention and study as any other problem of construction. Enquiries upon this subject are frequently received, among the questions most generally asked are the following: should the front circular rows of seats be level from end to end, or is it permissable that the outer ends be somewhat elevated? What is the proper incline, and should it continue to the rear of the seating space, or can, say, one-fourth or one-third of the rear be made level?

As to the question concerning dish-shaped or "bowled "bowled" floors, as they are called, they are a decided improvement over the all-level floor. The audience can see the speaker better and the speaker can see his hearers; and if there is any one thing that a public speaker desires above another, it is to be able to look his people squarely in the eyes all the time, so that he may have their undivided attention. Nothing lends to this end so much as the inclined floor.

Many new church buildings of any importance nowadays are being built with bowled floors. It is true they cost more, but the extra expense required to build them is well spent, and when once done the extra cost is never regretted.

How to build and what the best pitch to give them are questions requiring careful consideration before the construction is attempted. Otherwise the builder will soon find himself engulfed in a brain-wracking, lopsided problem that will tend to make him almost, if not wholly, forget what churches were ever intended for. There are high floors, low floors and intermediate floors that lead off from the bowled floor into lecture-room, etc., all of which should be carefully figured out as to the proper levels with one another; since they affect the stairways, doors, entrances, height of windows —especially those in the basement—as their tops should clear the ceiling in the lowest part of the basement, the height of the water-table, etc. In fact, to have all these things harmonize inside and out is the part which properly belongs to the architect to put down in black and white for the builders to read and follow.

The proper slant to give the floor varies with the size and arrangement of the rooms. Usually from a half to three-fourths of an inch to the foot will be found to give very satisfactory results. All points should slope to a common centre on a line back of the speaker's stand. This point should be in the open; that is, it should be a fixed point at an accessible place, a point to which a light wire may be attached to use for a radius to strike off the required arcs or part of circle at front and back; that is, where the slant dies out on the low floor and where it begins to fall from the high floor. Thus, it will be readily seen that any point of the dish will be at a dead level with any other point on the radius line of equal distance from the central point. Then each row of seats will be level from end to end as they should be. Mistakes are often made by not understanding this levelling question by supposing that the line of the dish where it strikes the wall or sides of the room in a straight incline. This cannot be, except where the central point is located in the corner of the room; then the walls are in line with that point and consequently the lower edge of the base will be straight.

Where one set of joists are used to form the dish, they must be laid in line with the central point, or fan shape, and the girders on which they rest, must be a part of a circle conforming to the radius from the central point. These girders should be built up with ⅞-inch dressed plank with width equal the desired depth of girder, sprung to the proper curve and well nailed with joints broken, and be continuous from end to end. This construction, as shown in fig. 2, is all right where it is not particular about the supporting posts being regular in the basement rooms, or to have the ceiling level, as the posts must conform to the girders' curve and the ceiling to the slant of the floor. But where it is desired to avoid these objections, it is best to have a supporting floor level with the lower point of floor. This will require straight girders, which with their supporting posts will permit of better taste in the arrangement of the basement rooms, and the ceilings will be level. The joist for this floor should be reckoned not only heavy enough to carry the live load that it

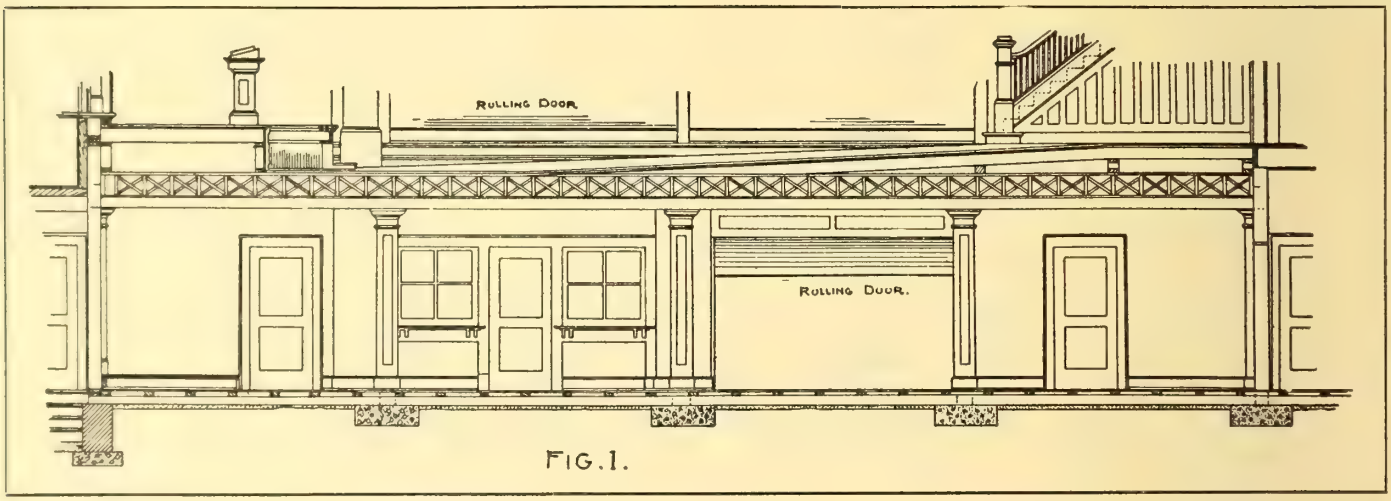


FIG. 1.

will be subject to, but also its own weight and the dished floor that is to go on top of it. These joists should be covered with good sound sheathing, or better still, with shiplap, which will serve for a working floor, during the construction of the building. Then after all heavy work is done, on top of this floor build the dished floor with lighter timbers; 2 by 6-inch joists will do if properly supported. These joists must rest with reference to the common centre as before mentioned, and should be cut to a feather edge where they die out on the lower floor. These joists should be covered with sheathing, changing their course as often as necessary to get good bearing for same; then on this place the finished floor, straight across the ditch. It is necessary that the foreman in the factory that builds the seats should know the incline given the floor and the radius of the front and back curves, so that he may lay out the seats accordingly, so that their backs will have the proper flare and the pew ends fit to the floor. Then when all is completed each row will be level from end to end. The pews should be placed from 32 to 36 inches apart. It gives the best effect to have the first two or three rows of seats rest on the level floor before starting the incline, which should extend back to the last row in the rear of the room.

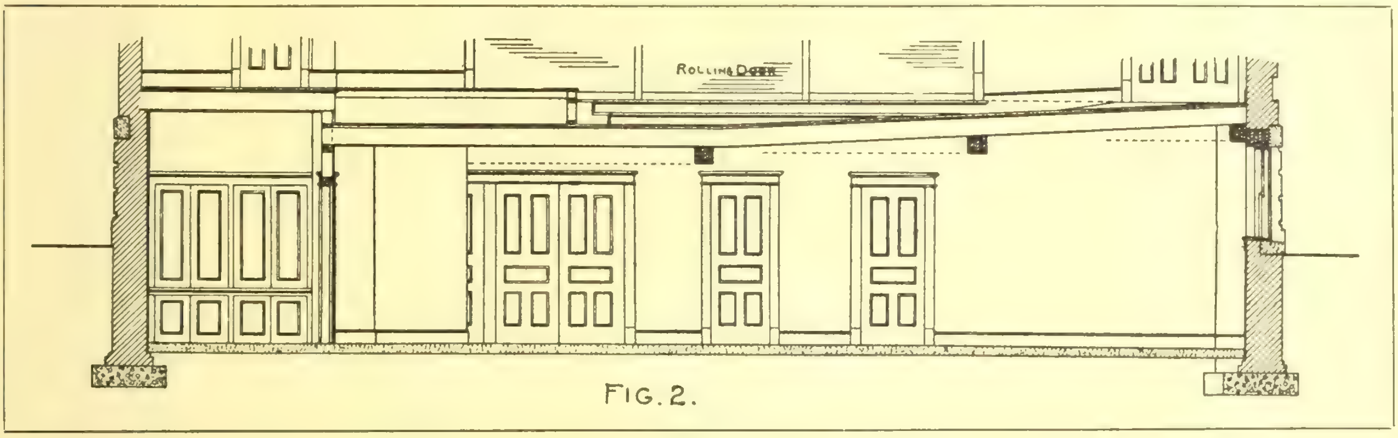


FIG. 2.

The accompanying illustrations show sectional elevations of the construction of bowled floors.

Fig. 1 shows the level bearing floor as above specified, and on this the bowl floor is constructed.

Fig. 2 shows the section of a bowl floor at the outer wall line, the bowl being formed by the one set of joists which must rest on circular girders to the curve to correspond with that of the bowl. The basement ceiling would, of course, have the same incline as the floor above. This section shows that for a corner rostrum, the centre from which the curves are struck, being at the corner of the room.

Abuse of Fire Hydrants

The Superintendent of the Water Department of Boston, Mass., in his annual report describes the possible results of promiscuous use of fire hydrants. He says: "While upon the subject of hydrants I wish to call your attention to a very serious matter which before long will have to be dealt with in a firm and decisive manner, viz., the abuse of hydrants by careless and ignorant operators. As you no doubt know, hydrants are primarily a fixture for the use of the fire department, and their value as such depends upon their readiness for use, which, in turn, is dependent upon their working order. Now it is an almost hopeless task to keep hydrants in a good mechanical condition while they are being operated by anybody and everybody. Our hydrants, in common with the rest of our fixtures, open to the right or exactly opposite to the direction in which most mechanical devices unscrew. The ignorant operator in his vain endeavor to open to the left applies all kinds of force, with the frequent result that before he realizes that he is turning the screw the wrong way it is strained, bent or broken, and the valve packing below is crushed into a useless mass. . . . It can easily be imagined what a serious state of affairs this might cause at the start of a fire. Helpless to stay its progress because of lack of water, the firemen would have to view the development of a conflagration, perhaps. Again, very few of these ignorant and careless men, who act without authority in many cases and without knowledge in every case, understand that there is a waste in the hydrant that will not operate unless a means is provided for the entrance of the air by leaving the nozzles open while the water is draining out of the barrel. . . . Upon shutting off the main valve they immediately close the independent or nozzle valve and thus trap the water in the barrel. It is not difficult to realize how in cold weather a frozen hydrant will result from these conditions, and a frozen hydrant is not a trifling matter in the event of a fire. I am of the opinion that hydrants should be operated exclusively by the fire and water departments, and other departments and contractors should secure their water through other means.

Slogans of the West

Wetaskiwin—"The Elevator City of Alberta."

Yorkton—"The Metropolis of Northeastern Saskatchewan."

Lanigan—"Yesterday: The Prairie; To-day: A Town; To-morrow: A City."

Strassburg—"The Heart of the Last Mountain Valley."

Saskatoon—"Happy, because its people are prosperous."

Gainsboro—"The Gateway to Southeastern Saskatchewan."

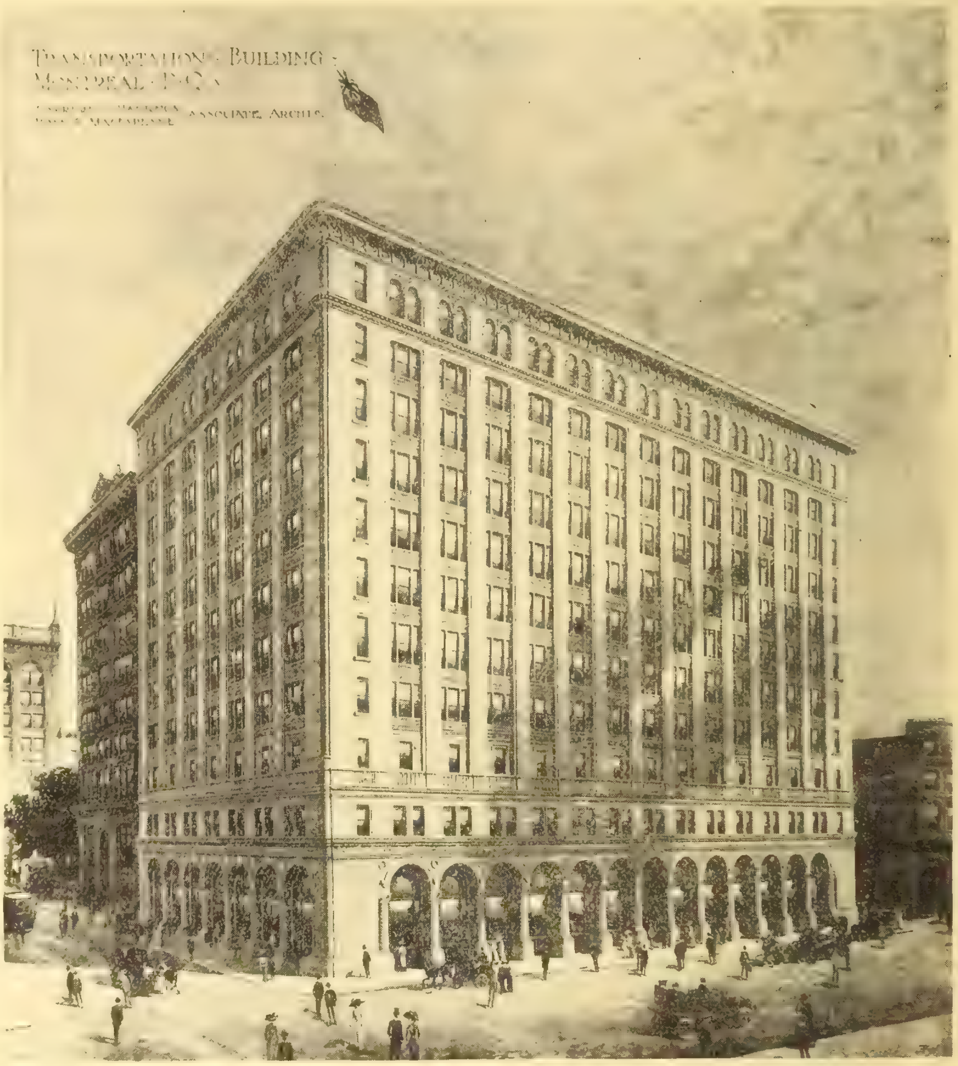
Stettler—"The Marvel of the West."

"The engineers find Gatun dam safe," read Mr. Jones from his newspaper headlines to grandma, knitting at the other side of the table.

"Well," she said, looking over her glasses in pained surprise, "I don't know anything about the safety of Gatun, but I think a family newspaper oughtn't to use such language in print."—Emporia Gazette.

Montreal's New Transportation Building

Handsome Ten Storey Structure of Practically Fireproof Material—To Face Three Streets and Cover Approximately Twenty Thousand Square Feet


Transportation Building
Montreal P.Q.
Associate Archts.

The new Transportation Building to be erected in Montreal will occupy the Seminary property bounded by St. James, St. Francois Xavier and Notre Dame streets, and will cover an area of approximately 20,000 square feet.

The building is to be ten storeys in height and when constructed, including basement and sub-basement, will have a floor area in the neighborhood of 200,000 square feet. A unique feature of the design is a broad arcade extending through the ground floor from St. James street to Notre Dame street, with an intersecting corridor leading to the St. Francois Xavier street entrance, and having a monumental staircase giving easy access to the Mezzanine or half floor above, and cafe, barber shop and other accommodations below.

The building is to be constructed as fireproof as modern science can make it; nothing but fireproof materials being used throughout, the structure itself being composed of steel, concrete, terra cotta, tile roof, metal doors and windows, and corridor floors, wainscots and the trimmings around all doors are to be of Canadian marble, the stairways are to be constructed of marble and iron, and materials of non-fireproof nature have been almost eliminated.

On the three streets between the arches, are single massive columns, giving an appearance of strength and solidity necessary to a building of this height.

The location of the building, and its frontage on three streets, makes it admirably suited for its purpose, and this has been kept in mind constantly by the architects in the preparation of their plans, in order that no detail might be neglected, which would add to its efficiency as an office building.

Messrs. Carrere & Hastings, of New York, to whom is credited the finest office building in New York City, and Mr. E. G. Bird, of Toronto, for many years associated with this New York firm, who have recently constructed the Traders Bank Building of Toronto, and structures of a similar nature throughout Canada and the United States, have been entrusted with this interesting project, while Messrs. Ross & MacFarlane, of Montreal, have been awarded the details of supervision and erection of the building. Messrs. Peter Lyall & Sons, Limited, have been awarded the contract for construction of building, and it is expected that work will be commenced early in 1911 and completed during the following year.

Sewer Contractress

About all fields of endeavor that formerly were considered for men only have been invaded by the fair sex. The last few years have seen the entrance of women into the civil engineering field, and even the contracting field has been invaded; at least three women control very successful street grading businesses. Now comes the announcement of a young woman student in the Engineering Department at the University of Michigan that she intends to make a specialty of sewer contracting. In a recent press report she announces her intention as follows:

"Why shouldn't there be just as much opportunity for a girl to win success building sewers as in writing stories, teaching school, doing sociological work or lecturing on woman's suffrage? I intend to devote my energies to becoming a successful sewer contractress."

Some Causes of Failure

The fact that a contractor fails to make a profit on a piece of work is not prima facie evidence that his estimate was inherently too low, says "The Contractor." It merely means that it was too low for the methods employed. There are some men who would lose money on a job at almost any figure, seemingly because, like the bark and bite of the dog, "it is their nature to." They have not the vision which sees the end of the work from the beginning, and therefore they are constantly in hot water.

A practical example was furnished on this point on a 40-mile piece of railroad construction in Pennsylvania. All of the work was let to one contractor, who sublet as much as possible in five and ten-mile sections. When the work was nearing completion most of these "subs" had to be kept under surveillance to prevent them from pulling out from a losing proposition.

One day the general contractor walked over the work and pointed out to the various sub-contractors where they had failed. In one instance too much had been invested in building a camp of boards, where tents would have been equally efficient, and far cheaper; besides the location chosen was very poor. Another had used pitcher pumps, where a power pump would have saved time and labor, and still another insisted on napping stones by hand where a crusher would have been advisable. A striking example was that of one of them who finished the grading very roughly, leaving it inaccurate to the stake readings and badly rutted by carts. All profits were sacrificed when the engineer, requiring neater work, and he by no means insisted on "sandpaper" finish, either. Another used carts and lost money during the wet season, where cars would have saved the situation. The height of folly was reached by the man who had a small steam shovel on the job, but insisted on mucking the top layer of a cut. When he was ready to use his shovel he found himself in rock, and as the work was let unclassified, it was easy to figure where his profits had gone.

Costs of Construction

Everyone who has had much to do with construction work during the last two years has become painfully aware of the steadily increasing costs and of the great difficulty in getting full competition in many departments of construction. Just what is the reason for this state of things is almost as difficult to determine as the cause for the general increase in the cost of living, more difficult, in fact, since one cannot attribute the former, as a shrewd observer attributed the latter, to the cost of high living. The situation is so serious as to call for more than casual comment and it ought to be the subject of thorough investigation; particularly to determine whether there is any one principal factor in the increase which is definitely ascertainable.

It is obvious, of course, that year by year the labor question becomes more and more serious, not alone from increase of wages, but, what is far more damaging, from a decrease in efficiency. Added labor costs alone, assuming the labor to be of uniform quality, certainly do not count for the final result. It would be a good and appropriate task for the Bureau of Labor staticians to go into this question and to attempt to determine, let us say, the cost of laying 1,000 brick at various dates during the last 20 years. Figures of this kind are conspicuous by their absence in most statistical reports on labor matters. It does precious little good to state what the mason's wages and hours of labor are unless we know how much he is by custom or rule likely to do; the same investigation ought to be extended to other branches of structural labor to determine for them similar data.

Another similar line of investigation ought to deal with the distribution of employment throughout considerable periods as bearing on the question of supply and demand. It is one thing to say that a certain grade of laborer receives $4 a day and it is quite another to conclude from this that he obtains this amount through any considerable proportion of the year. In other words, how far is the apparent rise of wages an indication of a real increase in earning capacity per annum, and how far does it merely represent irregular production with accompanying abnormal demand for comparatively short periods? This matter has a very serious bearing in some lines of manufacture in which it is rather doubtful whether the annual earnings of the workmen have much increased, a rise in labor costs of a manufactured article being largely due to changed methods of production.

It would also be extremely interesting for the statistical departments of the Government to analyze the increased cost of materials of construction, to find out not merely what the increase in current quotations has been, but what is its underlying cause. Take, for example, the matter of lumber, in which the rise of price is notoriously great. How far is this due to actual scarcity and how far to the operations of very large lumber companies which keep extremely careful watch of prices? The factor first named is undeniable, for the forests have been most recklessly cut away, and yet, on the other hand, within 10 or 15 years there has been a good margin for grades of lumber which a contractor would hardly have looked at previously, so that the scarcity is in part compensated by the access of material previously almost unutilized. And how much of the increase in costs due to lumber and other materials is to be charged to increasing indirection in handling and to formal or informal agreements to maintain the prices?

A genuine analysis of the distribution of costs between the original provider of structural material and the contractor, who takes it finally in hand, would be interesting and perhaps somewhat sensational. With all the talk of rising costs and all the ingenious explanations offered, there has been comparatively little done in the way of close investigation of the subject, and its importance would seem to demand much more rigorous treatment at the hands of the statistician than has yet been accorded it.

Mr. Malcolm D. Barclay, civil engineer and surveyor, has opened an office in the Lake of the Woods Building, Montreal. Mr. Barclay is a graduate of McGill University. For some years he has been associated at Montreal with Mr. Joseph Rielle.

Charles Mead, of the Carpenters' and Joiners' Union, Toronto, has been appointed the union's delegate to the convention of the United Brotherhood of Carpenters and Joiners, which is to be held at Des Moines, Iowa, in September.

J. R. Barry, A. Finlayson, Bert Beaton and J. O. Palmer, all of Fort William, Ont., have taken sub-contracts on the new line of the Canadian Northern Railway from Edmonton to the Pacific coast. Work on 70 miles of this line has been started.

A report is in circulation that gypsum deposits in large quantities are to be found at Grande Prairie, near Kamloops, B.C. An electric railway may be constructed between the two districts.

False Economies in Purchasing Machinery

Final Costs Reduced by Using the Best Types—Some Interesting Examples—A Contractor who Erected a Monument to his Folly*

The best goods are the cheapest; but this does not mean the lowest in first cost always. A certain foreman thought he had made a good bargain when, instead of the 90-cent shovel he had been sent to purchase, he brought back three dozen shovels at 75 cents each. There was a clear saving of 15 cents per shovel, or a total of $5.40 on the lot; and he felt proud that he had discovered the bargains. The superintendent looked them over; and while not well pleased with the material. put them out on the job, for time was pressing and he thought a trial was worth while at any rate.

So long as the work consisted principally of shovelling loose material the shovels were good enough and the men handled as much material as they did with the more expensive shovel. When the material became tough and there was digging to be done, they found that the blades had a tendency to kink unless handled carefully. Over on the next street the same number of men were employed digging with the more expensive shovel. The two gangs were carefully compared in the evening; the gang having the strong shovel was found to be digging 50 per cent. more earth than the gang with the cheaper shovels. The superintendent had an idea that the shovels were to blame; so late that night the night watchman opened the tool boxes and changed the shovels without the knowledge of the foremen. The next day the men who had been using the poor shovels the day before were pushed and their output was considerably improved. The men who had the better shovels the day before bent their shovels when they tried to do as much as on the day previous, so before noon were nursing their shovels. The record sheets that evening showed the result and the superintendent took pleasure in telling the foreman all about it. The low cost shovels were scrapped and good ones purchased in their place. The saving of 15 cents per shovel was lost twice over each day they were used in ground that was the least hard.

Pumping to Keep Ahead of the Elements

A contractor had a hole to keep clear of water. He found that a proper pumping outfit would cost $150 and that gasoline to run it would cost about 20 cents per day. Looking carefully over the work, he concluded that the cost of pumping would be very small, so had a tinner make a common suction pump at a cost of about $3. One man in the course of a day's hard work made little impression on the water, so two more pumps were made and three men set to work the next day. It rained the following night and the cost of pumping had been about $17 to take out just a little less than the rain put back. This was discouraging and the men complained that the pumps were back-breakers. A telephone call brought down a nice little suction pump, $15, requiring two men to operate it and they did not work any too hard. They cared so little for the work, in fact, that they quit when pushed. The valves kept getting out of order continually and that delayed matters. Finally, after spending $2 for new valves and $12 for labor, making a total cost to date for pumping of $46, the hole was cleared of water and concrete materials carried into the bottom to be used the next day. It rained that night and $140 worth of cement was ruined. The hole had to be pumped out again.

A good make of diaphragm pump was put in at $35, and men set to work. They did not work enthusiastically and were sensitive when spoken to, so gangs were constantly being broken up to replace the disgusted pumpers. The labor cost was $18 by the time the diaphragm pump had the water out; and as the skies looked clear the materials were again taken down and everything looked fine. Several days went by without mishap, and some one accidentally put a lot of stuff on top of the inconspicuous pump, hiding it from view. That night a sewer burst and flooded the excavation. The pump could not be found and the contractor in disgust telephoned for the $150 self-contained outfit that did not require any attention. It was put to work and the hole was empty before the pump had been working four hours. A sump was dug and the suction pipe put into it. If a black cloud appeared or anyone got nervous over the possible breaking of a sewer, some one rushed over to the pump and lighted a match, and in a second the hum of industry was heard where the pump stood.

The contractor said he had bad luck with that excavation. But it was not altogether luck; he simply failed to realize that good machinery is worth all it costs.

Thought Old Methods Good Enough Until Shown

A certain concrete contractor preferred to build a platform around his concrete mixer and wheel the stone, sand and cement up a long incline in wheelbarrows in preference to spending a good price for a hoisting bucket, or elevator. A contractor just finishing a job close by tried to sell him a second-hand loading outfit, but failed. Finally he asked the privilege of permitting his son to stay a couple of days on the job and take some cost data, which permission was readily given. The young fellow kept careful track of the cost of taking the concrete materials from the stock-pile and cement shed to the mixer, and showed the figures to the contractor, who was well pleased, for they were low for that sort of work. The next day the father came and made him a proposition to install the loading attachment and contract to do the loading for 75 per cent. of what it was costing by the wheelbarrows. The contract was signed and it was not until the saving amounted to the price asked at first for the second-hand outfit that he realized what a saving he could make by the use of such devices. His job was of a pretty good size and that little saving of 25 per cent. in the loading amounted to almost twice the price of the second-hand loader, yet the loader was the property still of the other man when the work was completed. To-day when that contractor is buying machinery he carefully estimates every item of his work in order to see if savings can be effected by buying labor-saving devices.

This Contractor Built a Monument to His Folly

A contractor priced a steel concrete bucket for hoisting concrete from the mixer on the ground floor to the upper floors of a new building. The cost of the bucket when divided into the yardage ran rather high, so he designed one and built it of wood. It was strong and heavy. It worked all right, but took twice the power the steel bucket would have taken, so was slower in operation. The first cost was less than one-half that of the steel bucket and it did look as if a saving had been made, until one day some one blundered when the full bucket was 40 feet above the ground, and it dropped "kerplunk." Of course work stopped and the men went home. Carpenters made a new bucket and repaired the tower, getting everything in shape by evening, and everybody felt badly; for if the bucket had not dropped the job would have been finished that day. On his way home that evening the contractor saw a bucket drop in another tower from a height of about 50 feet, and went over to look at the wreck, feeling there was after all some balm in Gilead. The bucket was all right, as a patented friction hanger had made it fall slowly. In fact, if it had been empty it would have fallen hardly more than 10 feet. The bucket was one he had decided not to buy because it cost too much.

---

*Reprinted from The Contractor, Chicago.

He went home thoughtful, but his wife cheered him up by saying he really would have saved money if the bucket had not dropped. That night the heavens opened wide and stayed open for a week. All contractors know how that is. The farmer has no monopoly of trouble, due to weather conditions being less than perfect. Contractors do not make so much noise about it as the farmers do, but they suffer just the same. When this particular contractor went into the hands of a receiver after the rain ceased, he asked for the wooden bucket and it was given to him. He, of course, got on his feet again and is now in the contracting business. In the back yard of his nice little home is a well with a small house over it, consisting of roof and four small pillars. The roof of this well is that wooden concrete bucket upside down and having attached to it a little sign reading "Don't Be a Tight-wad." This well, the contractor says, furnishes refreshment for man and beast, including foolish persons. The story is true.

She Delivered the Dynamite All Right

Every man to his trade. A contractor in the heart of Africa or away in the wilds of some half-civilized country is compelled to make shift, and the more he knows about rough and ready ways of doing things the better fitted he is to survive. He can be expected to do many things that would be simply foolish in this country where the telephone is at one's elbow and obliging supply and material men are ready to take things out to the job at once. They go so far in being obliging that once the writer was surprised to have a lady come out to a job he was handling, in an electric runabout and ask for him. She explained that her husband asked her to take out to the job two kegs of nails, a can of oil and five sticks of powder, as the wagon was not at the store when the hurry order went in. She also brought the husband's apology for not sending out the whole order, which he promised to get out as soon as the wagon got back, even if he paid the driver overtime. The stuff was taken out of the runabout and the lady rode away with a glad feeling that she could help her husband. She was probably in a heavenly frame of mind, but little thought, or perhaps realized, how near she came to heaven that afternoon riding with the dynamite rolled up in the cushion to keep the sun away from it. That was carrying business courtesy to great lengths.

The Effect of Sewage Gases on Concrete

Results Noted at Hampton Disposal Works Experiments with Coatings of Coal Tar, Pitch, Linseed Oil and Resin

At a recent meeting of the Concrete Institute of England, Mr. Sidney H. Chambers read a paper describing the effect of sewage and sewage gases on the Portland cement concrete of the disposal works at Hampton, which are under his charge. The following is a summary thereof:

The sewage on its arrival at the works is delivered from the force main into a screening chamber, and after passing through the screen, is conveyed by a channel to the detritus tanks. From these tanks the sewage enters a hydrolytic tank, which, together with the detritus tank, was installed in 1903. The main bulk of the sewage, 80 per cent., passes through at a comparatively high rate of flow, issuing in four hours as a clarified liquid, while 20 per cent., containing the deposited matters, is 16 hours in the tank. After flowing over the weirs of the first portion the liquid enters a channel which leads to the second portion of the tank, consisting of four hydrolysing chambers arranged in sequence, and filled with large flint stones. The liquid, having taken three hours in its passage through these four chambers, enters the lower channel, which conducts it to the contact beds.

The sewage of Hampton is of a strong domestic character. It has undergone thorough disintegration by the lifting operations, and by the putrefactive changes occurring in the rising main. It is malodorous on its arrival at the screening chamber, where, as it leaves the rising main, it evolves sulphuretted hydrogen and other bad-smelling compounds. The liberation of these gases constitutes a nuisance necessitating the screening chamber, channels, and tank being covered in, and a means being provided for drawing a large volume of air through them before discharging the gases into the atmosphere.

The whole of the tank and channels is constructed of Portland cement concrete. The walls of the tank are 6 feet 6 inches in thickness at the base, and 1 foot 6 inches at the top, and are strengthened by tie-rods; the roof is 6 inches in depth and is reinforced by expanded metal, and the channels are covered by 2-inch indurated paving slabs. The work was executed by departmental labor, and the best materials were used.

The concrete was composed of one part of Portland cement properly mixed with clean water and six parts of ballast thoroughly free from loam, clay, mud or dirt of any kind, and no material was allowed to be used larger than would pass through a 2-inch screen.

The makers of the indurated paving flags state that they are composed of granite chippings, washed and crushed to pass through a ¼-inch mesh sieve, and heavy Portland cement made by themselves, the raw material for which is obtained from the Barrow-on-Soar blue lias beds. The materials are mixed in the proportion of 1 part cement to 3 parts of granite.

Early in 1905, a few months after the hydrolytic tank had been put into use, it was noticed that the roof and walls of the hydrolysing chambers above the liquid level were white or yellowish in appearance. This efflorescence was not crystaline in structure, but was of a chalky subsistence, and resembled distempered work on a damp wall. On examination it was found to be due to a thin covering of sulphur, which could be easily removed by rubbing. Later the face of the walls and the roof in the second part of the tank showed signs of peeling, and the concrete appeared to be disintegrating. A thorough inspection of the installation was thereupon made.

At the screening chamber nothing appreciable was observed, neither at the highest water level nor on the underside of the roof. The concrete was sound, and when struck had a good ring. Immediately adjoining this chamber was the main sewage inlet channel, along which the whole of the gases pass to the main air duct leading to the air filter. At this point slots were made in the concrete to receive a dam; the concrete at the back of the grooves was found to have disintegrated, although the sides were perfectly sound.

Further along this channel it was observed that the greatest disintegration had taken place on the walls at the liquid level. Owing to variations in the flow of the sewage, the level of the liquid in the tank and channels rose and fell; thus a certain area of the walls was constantly being immersed in the sewage, and then exposed to the air. This area was, consequently, even when not immersed, much wetter than the part of the walls which was always above the level of the liquid. The latter area at this point showed erosion, which, however, had not penetrated so deeply as that at the level of the liquid itself. At the liquid level there was a deep groove in the concrete, and above this the face of the work had bulged out and lost its nature.

The first portion of the tank, the hydrolytic tank proper, appeared to have suffered very little. The walls and roof had only the slight sulphur deposit. At the liquid level, which varied less than in the channel, there was a slight erosion. The second part of the tank, the hydrolysing chambers, was found to have suffered in places to a marked degree. It was obserped on breaking through the erosion on the surface that the concrete at the back was moist, soft and gritty. Also, it was noticed that increased dampness constituted an important factor in the destruction of the concrete, for the lower parts of the vertical faces of the beams supporting the roof were more affected than the upper parts. The lower portions of the vertical walls of the tank also were more eroded than the upper. At the liquid level the concrete had been severely attacked, and a deep groove existed in it.

Two samples of surface concrete were taken above and below the liquid level, and the following was the result of the analyses:

Character.	Below liquid level. Sound.	Above liquid level. Unsound.
Appearance	Gray	White
Texture	Hard	Soft
Ratio cement to sand	1 : 2	3 : 2
Sulphate of lime in cement	Trace	66 p.c.

The same pronounced effect was to be seen in connection with the concrete blocks, which were grooved to receive sliding boards ad project above the liquid level; these blocks had in many instances crumbled away to such an extent as to be almost shapeless. Recently these chambers were emptied, and it was found that the concrete below the liquid level was perfectly sound and in a good state of preservation.

The lower channel conveying the liquid from the tank to the contact beds revealed the same characteristics as were observed in the upper channel, but the portion at the liquid level was very much more markedly affected.

Samples taken of the lining of the sides and covering gave the following analyses:

	Ratio Cement.	Sand.	Sulphate of Lime in cement.
Concrete at varying liquid level....	1	1	70.26 per cent.
Underside of slab forming covering	5	1	74.61 per cent.

The air duct taking the gases from the effluent channel of the primary beds and communicating with the tank outlet channel was found to have a coating similar in appearance to that observed on the underside of the covering to the channels.

Analyses of this coating were made, with the following results:

	Ratio Cement.	Sand.	Sulphate of Lime in cement.
Underside of slab forming covering of air duct	2	1	70.71 per cent.

The point to observe in the above analyses was the conversion of the lime in the cement into sulphate of lime, the sulphur being obtained from the sewage flowing through the tank and channels, as well as from the gases expelled from the sewage, and contained in the air withdrawn from the several parts of the installation.

Mr. Chambers has concluded that the effects arose from the putridity of the sewage and the oxidation of the putrid products by the air supply. The main erosive effect is at the varying liquid level, and is therefore dependent upon the amount of sulphuretted hydrogen in solution in the liquid. The gas is comparatively small in amount in the incoming sewage and in the liquid in the hydrolytic tank, and increases as the liquid passes through the hydrolysing chambers. The results of this are especially well shown in the two channels; the alternate wet and dry area of the upper channel conveying the sewage from the rising main is less markedly affected, while in the lower channel the corresponding area is severely attacked. So with the two parts of the tank; the first part into which the sewage is delivered, and wherein comparatively little putrefaction takes place, has not been affected to anything like the extent that the second part or hydrolyzing chambers has.

When th elevel of the liquid falls it leaves the concrete which it previously covered wetted with a liquid containing sulphuretted hydrogen in solution. This wet surface is then exposed to the action of the air supply, which oxidizes the sulphuretted hydrogen with the production of sulphur and sulphuric acids; these decompose the concrete, the lime being converted finally into sulphate of lime. What the exact nature of the intermediate compounds is cannot be stated, as none of them have been isolated, but it is probable, Mr. Chambers believes, that the active agent is sulphurous acid, as it is known that cement is insoluble in sulphuric acid. When the liquid rises again, the decomposed concrete is washed away either wholly or in part, and a fresh surface is exposed to action when the liquid falls again. It is the continuation of this cycle which leads to the formation of the grooves at the varying liquid level.

The erosive effects on the concrete above the liquid level are dependent upon the sulphuretted hydrogen, evolved from the liquid and mixed with the air supply. Some of this gas is dissolved by the moisture which is present on the walls and roofs, from evaporation and condensation; it is then oxidized by the air, and decomposes the concrete as described above. In this case the decomposed concrete either remains as a coating on the surface, peels off, or crumbles away.

In order to observe the phenomenon on concrete tubes, two 9-inch concrete tubes were selected, which were supplied by the makers of the paving slabs previously referred to, and were composed also of similar materials in the same proportion. One of the tubes was coated with Dr. Angus Smith's composition (coal tar, pitch, linseed oil, and resin). They were placed side by side in the second part of the tank in such a position that they would be subjected to the rise and fall in the level of the liquid. At low level the tubes were not in contact with the liquid, and at high level the liquid rose to half the diameter.

After the tubes had remained in the tank for eight months they were taken out and examined. The coated tube did not appear to have been affected, other than at the highest liquid level, where a thin line could be observed, and when struck it was found hard and had a good sound. It was noticed that there were two areas on this tube without any coating, due no doubt to its having been placed upon two supports to allow it to dry; these areas were soft on the surface and similar to the uncoated tube. With these exceptions the tube appeared to be in as good a condition as when first placed in the tank. On the other hand, the uncoated tube had a distinct line at the highest liquid level, which was found to be soft, and when tapped with a chisel had a dull sound; the interior of the tube which had been immersed appeared soft and had a dull sound when struck; the portion of the tube above the liquid level was unaffected, and when struck had a clear ring.

Canada a Field for American Builders

A wide and profitable field for additional activities of American contractors presents itself to-day in connection with the development of the rich territory of western Canada. As in other lines of activity, Americans have not been slow to grasp the opportunity offered there, and many contracting firms in the northwest border States and in other localities have been taking up contracts north of the line. The country is being exploited and improved rapidly, but there will be great future development, which is now barely started. Assistance is needed from the highly organized forces and improved methods which have been evolved in the handling of large and difficult projects in the making of our own west. The American takes to the new northwest country a valuable fund of experience, obtained under similar conditions in his own country, which is an asset not possessed by many of his competitors.

Americans are constantly becoming more intimately associated with western Canada in a great variety of activities. Settlers are moving over the line by thousands annually to take up the promising agricultural lands there. Capitalists are investing hundreds of millions of dollars there in industries and railroad enterprises. As the agriculturist and the capitalist become interested, the contractor is also turning his energies into this profitable channel to assist in carrying out their enterprises. So far the chief trend of his activities has been along the lines of railroads, docks and irrigation works. It is probable that for some time yet large projects of that character will be the chief source of attraction for the American builder. But with further development in the new country, additional profitable fields are sure to open.

The tariff presents an obstacle to the contractor carrying new plant and equipment across the border, but he maintains an advantage through favorable position, good transportation facilities and superior organization, together with the apparent indifference exhibited by many firms of British connection. The initiative of the American and his willingness to take risks which promise good profit give him a decided advantage over his British cousin when competing for such work.

The power of the American as a factor in Canadian enterprise is well shown in an article by Mr. Arthur Hawkes recently published in the "Nineteenth Century Review," of London. It is a summary of observations made during several years of extensive travel in the United States and Canada. Mr. Hawkes points out that the English have shown comparative indifference to the opportunities offered in Canada, being slow to take advantage of them, or to follow up actively such enterprises as they have entered. On the other hand, the Americans have followed their advantage with characteristic energy at every point. The Americans are at work there with the same energy which has produced such remarkable results in the middle west of their own country. He points out that the development of Canada will be beneficial alike to Great Britain and the United States, and makes a plea for greater activity on the part of the home people so that they may get their full share of the benefits.

Large sums of money are being expended in Canadian development, and will continue to be invested in the future. The contractor as well as the manufacturer and promoter, should keep his attention on that quarter. —The Contractor.

Importance of Good Roads

The Premier of Saskatchewan, Hon. Walter Scott, made the following extended reference last week to the good roads question:

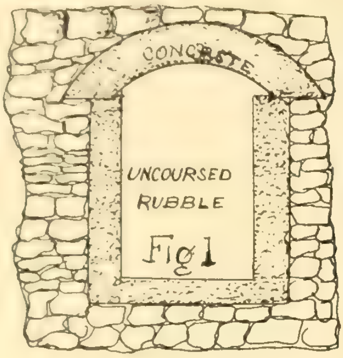
"The problem of highways, in my opinion, is scarcely second in importance to the problem of railways. Quite likely our railway question will be solved at least in fairly satisfactory degree long before we have reached any approach towards a complete solution of the highways or good roads problem. Such has been the experience of most of the States of the American Union and of the Provinces of Eastern Canada. In the eastern Provinces and in a majority of the States, the people are now reasonably well served by railways as far as concerns proximity to railway shipping points, but in how few sections can it be declared that the roads are all that can be desired? In connection with the highway problem the people of America have a great deal to learn from the people of England and Germany and France and other parts of Europe where there are public roads vastly superior as a rule to those existing up to the present day on this side of the Atlantic. Possibly the reason for these conditions may lie partly in the fact that in England and Europe the highways preceded the invention of railways, whereas in America it is largely true to say that the railway has preceded the highway. And I firmly believe it to be true that as between railways and highways a disproportionate amount of attention has been devoted to the railway question, to the neglect of the good roads problem, which is at least equally important."

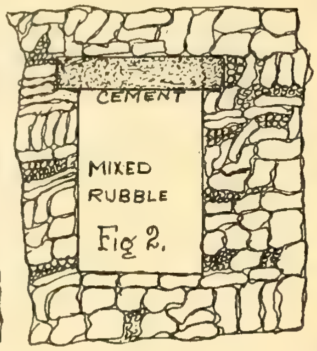
The action brought by the Concrete Pole Company, of St. Catharines, against the York Construction Company, of Toronto, for over $9,000, in connection with certain work on the Trent Valley Canal, has been settled out of court, the defendants having paid the claim in full.

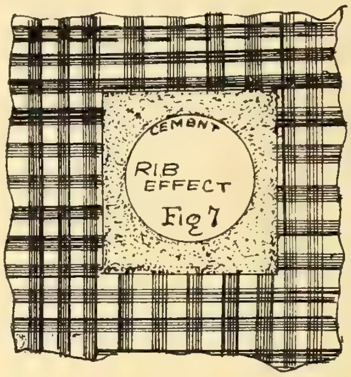
The city council of North Vancouver invited applications for the position of engineer and the position of assistant engineer for the district. The applications were to be in by July 21st and an appointment will probably be made shortly

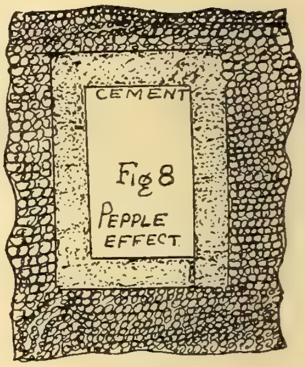
Effects in Rubble Masonry and Concrete

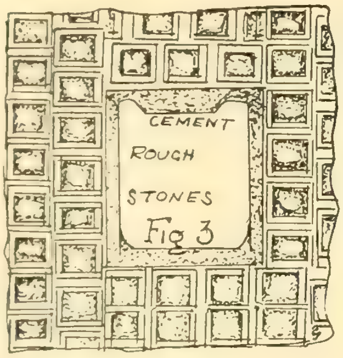
Employment of Irregular Sized Stones in Patterns—Increasing Adoption of this Principle as a Means of Building Decoration

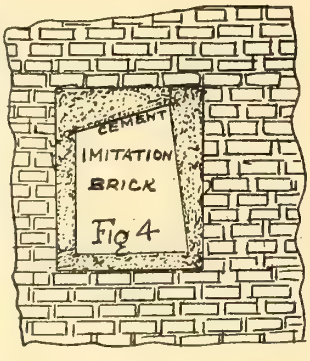


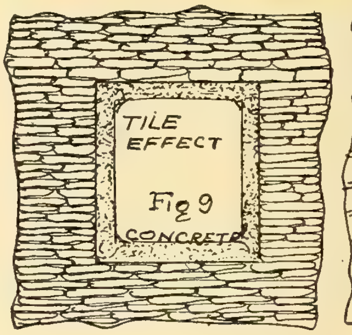


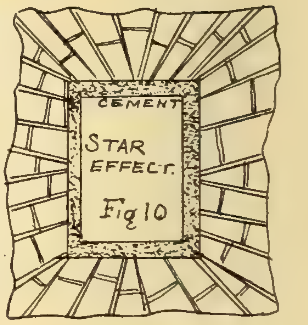


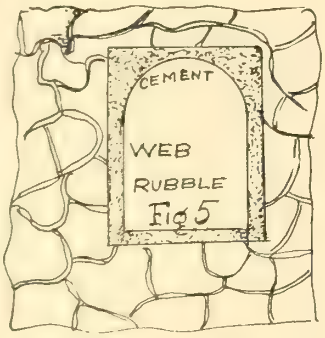


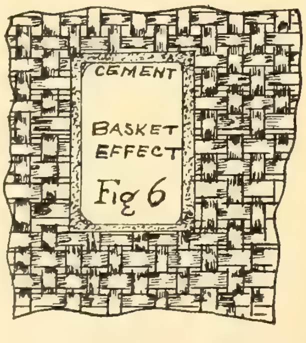


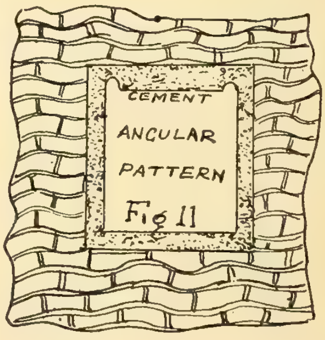


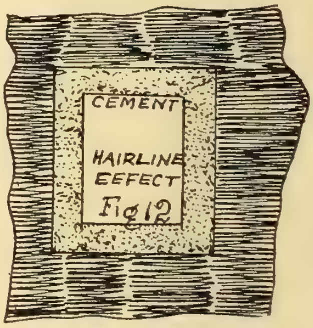












Rubble work of irregular-sized stones employed in conjunction with patterns formed from cement, is being used quite extensively in modern building operations, says George Rice, in the "National Builder." Walls of exceedingly attractive appearance are being laid up with the assorted stones and concrete creations. In some instances the stones are chosen in the rough and used, in any manner they come. Then again, the hammer and chisel are brought into play to get the stones into the various forms needed for the development of certain artistic designs. While granite and sandstones are picked out for this work, so far as is possible, one may find almost any grades of stones used in the building of the combination concrete and stone rubble walls. There are different classes of the rubble work, as is well known to the profession, and some of these kinds are elaborated in the cuts in connection with the concrete portions. The concrete part may consist only in the window sash about which the rubble work is built, or the concrete may be in blocks intermingled with the rubble work. Then again, there are imitations of rubble work made in the cement stock direct and applied to the building service with good results.

In fig. 1 is a model of uncoursed rubble work surrounding the window frame of concrete. Under the heading of coursed work, as here shown, there might be a classification of random-coursed, square-coursed or irregular-coursed designs. Or the work can be developed on the plan of the mixed rubble with a concrete top for the window opening, as in fig. 2. In fact, quite a range of styles can be wrought out.

In fig. 3 is shown a cement window frame, about which is arranged the blocks cast in the form of rough stones. In fig. 4 is another combination made up with the sash of cement and the imitation brick wall moulded from cement. In fig. 5 is the web rubble sometimes seen in walls is shown. Hammered dressed stuff is sometimes used. The proportions in the stones in some of the walls must be calculated in proportion to the degree of breaking strength required. For the average type of wall, however, the rubble work is usually put up with the class of stock on hand. In case the rubble work is of a character likely to crush under the weight upon it, sheet lead can be inserted in the joints. Unless done right, the pressure often forces the lead out, hence care has to be taken to get the lead properly set.

A basket effect is shown in fig. 6.

You can find angular and diagonal effects in rubble-work to a greater extent now that cement is used in forming the material used in the creation of the walls. The concrete manufacturers are capable of making patterns in imitation of high-class rubble service of any description you desire. For this reason ribbed patterns, blocked patterns, two-point patterns and other styles of unusual effects are observed. A rib effect for illustration is shown in fig. 7. Then, in fig. 8, a pebble style of erecting the wall is given. A tile presentation is shown in fig. 9. This combination is popular. The tile effect can be found in use in colored stone and in pure white marble. I saw some highly polished illustrations in tile creations finished with polished surfaces so that the surfaces shone brightly. Granite can be made with an excellent finish with proper rubbing tools. Then there is sunk work likewise used in the tile effect, in which certain pieces are depressed below the common level of the tile.

Fig. 10 illustrates a star effect developed by extending the courses outward regularly from a given point. The given central point in this instance is the centre of the window sash.

An angular effect is shown in fig. 11. This involves the coursing of series of stones in which the stones are composed of slightly curved pieces. Hairline effects are in use and a sample sketch of this class is given in fig. 12.

Since the manufacturers of cement articles for building purposes have taken an interest in the combining of rubble work with concrete parts, there has been considerable advancement made along these lines. The creation of new patterns, the elaboration of antique styles and the bringing out of certain typical hues in colored stock have tended to develop a market for this line of wares for building purposes.

Improvements in Concrete Construction

Complex Problems which Have Been Solved—Scientific Tests Resulting in Increased Safety of Buildings—The Value of Specifications

The fact is that concrete construction of all kinds must in the last analysis possess a high degree of fireproof quality and rigidity of form. If either of these qualities are weakened or reduced the standard of concrete buildings must suffer. Concrete is used by so many different kinds of builders and contractors that its abuse is quite common. The building collapses of concrete were typical of poor or ignorant workmanship. They simply illustrated the weakness of this material when handled by incompetents.

Concrete differs from clay as a building material in that it can be employed by builders generally without the equipments, which gives a certain standardization to clay products. The latter are produced by companies who employ only specialists, and consequently there is a uniformity of material, which gives standard results. On the other hand, any builder who can afford to buy a few barrels of cement can put up structures of more or less dangerous character.

City building departments have consequently been forced time and again to regulate the use of concrete and to issue specifications governing its mixing and setting. For many years concrete engineers were not in entire agreement as to the best manner of using concrete, and it required long and severe tests to secure the proper data to demonstrate the highest efficiency of certain mixtures.

When we come to reinforced concrete the problem becomes even more complex. In this form of building material we have two scientific factors to consider carefully. The tension and expansion of the reinforcing metal must be considered and also the mixing and setting of the concrete. Ignorance of either one of these factors must eventually lead to disaster. It may not be that a single mistake in estimating the strength of either will cause a collapse, for often buildings with distinctly weak walls or piers will stand for years without falling. But this is due chiefly to the fact that the load factor has not been severely tested.

Ordinary building laws must specify the nature of the reinforcing material as well as the nature of the concrete mixture. This is particularly true where the material is being used for floors. The danger is that builders in their effort to economize in the metal reinforcing rods will whittle down the size and strength of the rods to the danger point. They apparently trust too much in the rigidity and strength of the concrete. Hence collapses. Another point of vital importance; very often the metal reinforcements are not properly clothed with the concrete, and a small interior fire warps and twists the metal rods. This warping and twisting cracks the concrete and causes disaster. Metal for carrying the load of a building can never be looked upon as a fireproof material. It is too easily affected by the temperature of the air and it can be depended upon only when it is protected by a good covering of concrete.

Reinforced concrete has been subjected to severe and repeated tests, and many of these tests are still in the process of development. The United States Geological Survey has recently finished the most elaborate of tests. These have been carried out through twelve months of time, so that the relative value of the concrete up to a year after mixing can be determined. A further desire aimed at in these tests was to ascertain the actual value of different kinds of gravel, granite, limestone and cinders for use in the concrete. The questions of age and consistency of the material in giving strength and stiffness to the walls were matters of prime importance.

Scientific tests of this nature are of the utmost value to city building departments and special commissions. The average man looks with suspicion upon many of the so-called tests. He is afraid that some of those making the tests are interested in the business, and hence there is an inclination to accept the figures with a certain degree of allowance. Official tests by government experts are not subjected to this suspicion and consequently they represent a certain standard for general use.

Specifications for cement users are of the greatest value in helping city building departments to arrive at proper building regulations and also for guiding the builder who may wish to erect a few structures of concrete. The man who wishes a concrete house put up for himself cannot be expected to follow all the technical discussions about the mixing and setting of cement. He must depend upon the builder or architect to supply this information. Similarly the investor who puts his capital in big reinforced concrete houses must depend both upon the builders and the city's building regulations. The chief objects of building concrete houses of any kind or shape are economy, durability and fire protection. The first may be obtained often at the expense of the latter. Cheap concrete houses can be easily planned and erected, but unless the walls and partitions are durable and fireproof the cost in the end is far from cheap.

The best builders of to-day have reached a consensus of opinion that specifications cannot be too rigid in the use of materials and their proper proportions. Columns and other structural parts that are subjected to high stresses require exceptionally rich mixtures, carefully compounded and set. In the past very often this rule has not been carefully followed, and collapses have resulted. For columns and supporting parts of the structures the proportions should be at least one of cement to one and a half of loose sand and three of loose gravel or broken stone. Anything short of this mixture will reduce the strength and rigidity of columns so that danger is invited. Even this proportion is not strong enough for high buildings where the load factor is great. It applies to rather low buildings not intended to carry any great load, such as factories and storage warehouses. These latter require particular specifications worked out according to the weight of the load to be carried by the upper floors.

Reinforced floors, beams, columns and arches in buildings subjected to a good deal of vibration, especially in factories and lofts where machinery is used, require proportions of 1 : 2 : 4. That is, one part of cement should be used for every two of loose sand and four of loose gravel or broken stone. Here, too, variations must be made according to the load to be carried. The size and number of the metal rods used for reinforcing are matters that have to be worked out in each individual case.

Concrete machine foundations, retaining walls, abutments, piers, thin foundation walls, building walls, ordinary floors and sewers with heavy walls should have a proportion at least of one of cement to two and a half of loose sand and five of loose gravel or broken stones.

There is finally unimportant work in masses where concrete of a thinner mixture can be used with success. These include foundations supporting stationary loads, heavy walls and the backing of stone masonry. The proportions recommended for this work are 1 : 3 : 6. The danger in using concrete for building purposes is that an unscrupulous person will confound the different classes of work and attempt to use the specifications of one for another. Thus, if the lean specification for a stationary foundation should be used for foundations subject to heavy vibrations where machinery is used, there would be a collapse sooner or later. Likewise, if such a mixture should be employed for columns and structural work the building would be unsafe. Reinforced concrete needs also a rather strong mixture, so that the metal rods are held firmly in position and not permitted to bend or change position. The fireproof quality of the walls or beams is in direct proportion to the amount of cement used. Reinforcing rods must be covered with at least several inches of good concrete to protect them from the action of fire.

The quality of the sand and gravel must be considered as well as the proportions and the nature of the cement. Thus, anything which will not pass through a sieve with ¼-inch round holes should be rejected and must be included in the coarser gravel or broken stone. The careful measuring of the different parts is essential to success, and any attempt to use the sand without careful sifting means danger. Cement passes through a chemical process in the course of setting, and it must have the right particles to bind the mass together securely. The ideal concrete is a mixture with just enough cement to cover all particles of sand and stones and fill the voids without an appreciable excess of the binding agent. Thus, too much, as well as too little cement may work evil in any kind of building operations.—The National Builder.

A campaign is in progress among the residents of St. Catharines, Ont., and the Niagara district for the deepening of the Welland Canal.

Victoria City Engineer's Report on Dust Problems

The following is an extract from a report submitted decently by Mr. Angus Smith, city engineer of Victoria, B.C.:

"The result of experimentation of the last few years and the study devoted to it by highway engineers and chemists demonstrates that the road surface is constructed to advantage with bituminous binders exclusively. The experiments for the last year or two both in Great Britain and in the United States to demonstrate that the laying of the dust can be satisfactorily accomplished by the calcium chloride method and by the application of oil.

"During the year 1909 the city of New Bedford, Mass., spent $14,000 on dust laying preparations. It was a popular expenditure and although there was some complaint from owners of bicycles that the oil caused a rapid deterioration of the rubber tires and the press recorded a few complaints of injury to carpets, the general opinion was one of approval. The city was unable to comply with the request for oil. The dust layers were dustoline and a heavy asphalt oil and standard road oil.

"The city of Victoria has approximately 23 miles of macadam roadway. The roadways are of varying ages and in various conditions of maintenance. The older roadways are quite dusty. It will be necessary for the city to confine its attention in the immediate future to the using of dust layers and it should experiment in the direction of dust prevention by using in the construction of a macadam roadway a more homogeneous and harder stone together with some form of elastic binder.

Use of Calcium Chloride

"There are several of the older macadam roadways that should be spiked, cultivated, graded and rolled and after resurfaced with a material mixed with a binder. The city has recently received from England ten tons of calcium chloride. The solution used for watering is made by dissolving 100 pounds of calcium chloride in 100 gallons of water. The roads should be watered twice with this solution, an interval of one day being allowed to elapse between the first and second watering. Three hundred gallons should be made to cover 800 square yards at each watering. For subsequent waterings, one thorough watering will suffice, using 300 gallons for 800 square yards. The solution may be applied with the ordinary street sprinklers. Calcium chloride is a chemical and in its ordinary commercial form is a solid mass, and is hauled in hermetically sealed drums. It is a delinquent salt with the property of absorbing water from the air and retaining it in solution. The quantity of this chemical when exposed will absorb a definite quantity of water, varying with the humidity of the atmosphere.

"Toronto uses a petroleum residue, a portion of which comes from Pennsylvania and the balance from Canada. This oil is of a parafine base and is not so suitable as the California oil, which has an asphalt base. The cost of the latter precludes its use in Toronto. The ordinary street sprinklers are used with the exception that the bore of the sprinkler proper is increased and made uniform throughout. Toronto has had its macadam roadways well surfaced and crowned with oil five times a year. Tacoma, Wash., has had very little experience with this question, but proposes trying oil on the macadam roadways. Portland uses oil on its macadam roadways applied with a sprinkler; 125 barrels is made to cover one mile of roadway 20 feet wide. The oil costs $1.05 per barrel. This city does not oil the full width of the streets, but where a street is 30 feet wide only oils 20 feet in the centre. The oil is used cold, but better results are obtained on a warm day.

"I believe the most permanent and satisfactory method of treating the present macadam roadways is to resurface the partly worn roads with some one of the accepted and approved bituminous binders."

Ottawa Parliament Buildings Poorly Protected From Fire

The Parliament Buildings at Ottawa have been severely criticized by Fire Chief Graham in a special report which he has prepared upon the fire protection appliances afforded in these buildings. One of the buildings, he refers to as a fire trap, on account of the quantity of waste paper, boxes, etc., which have been allowed to accumulate in the corridors. In some cases extinguishers have been found to be useless and outside standpipes to be of a size that would not fit the city's hose. He recommends more extinguishers in the House of Commons. In the library, with all its valuable books, he found two hydrants enclosed in cupboards and locked. To open one of them required five minutes before the key can be found. Accumulations of paper and boxes were found in great quantities in the basements of most of the buildings, and, in fact, the situation was one which surprised the fire chief greatly.

In the west block the fire chief was told that the pressure was always at 30 pounds on the mains, but upon inquiry he found that it is supplied only to the lower floors, not to the attic or roof, which were without water nearly all the time. The corridor throughout the basement he found in a very bad condition, being littered with waste papers, boxes, straw, etc., and also large wooden cupboards filled with surplus stock of paper. "We do not permit rubbish of the kind," he says, "to accumulate in any business buildings throughout the city. There should also be more chemical hand extinguishers placed at convenient points in the basement."

In regard to the east block, he reports as follows: "The conditions were very good with the exception of the attic and the record library in the Secretary of State's department. This part of the building is a fire trap and there are only a few pails half filled with water. This portion especially should be well supplied with chemical extinguishers.

"In the Langevin block the basement could not have been in a worse condition. I found every room and corridor filled with paper and cardboard boxes." He suggested that if the basement was always to be used for storage, an automatic sprinkler system should be installed. The printing bureau he reported had not ample fire protection. He recommended more chemical extinguishers. In the Supreme Court there was no fire equipment whatever. In the Post Office there were no hydrants or horse. The condition of the Archives Building, the Royal Mint and Rideau Hall were all good.

News and Notes

Fort William, Ont., plasterers have raised the price of lathing from 4½c to 5c per yard.

The formation of a citizens guild for the promotion of civic improvements is under discussion in Guelph, Ont.

The formation of a citizens' guild for the promotion of civic improvements is under discussion in Guelph, Ont.

The British Columbia Sand & Gravel Company, Limited, and the Victoria Contracting Company, Limited, have formed an amalgamation to be known as the Producers Rock & Gravel Company, Limited. By means of this arrangement the business covered will be greatly enlarged and the plants will be extended.

The arrangements which were being made by the city of Victoria, B.C., for obtaining a supply of water from Sooke lake have had to be abandoned. Much opposition to the proposed work arose and a great deal of unpleasant feeling was engendered between those who were urging the work and those who objected to it, which finally resulted in complete abandonment of the idea.

The city of Vancouver is making a wonderful record for itself this year. The total value of new buildings for the first half of July amounted to $365,315, whereas the record for the whole month of July, 1910, was only $549,107. At that date the total value of building permits for the year amounted to $7,251,195, which is only $7,370 less than the total for the whole of the year of 1909, which in itself was the record of all previous years. The entire total of permits for the remaining five and a half months will therefore go towards establishing an increase upon all previous records.

An interesting situation has developed in Vancouver in connection with the eight hour day provided for on all city contracts. Mr. M. P. Cotton, one of the city contractors, has had trouble with the Italians working on his jobs, as they want to work for nine hours a day. They have tried to enforce their desires by striking and by intimidating workmen upon other jobs. A number of the Italians visited gangs working on Mr. Cotton's various jobs and displayed knives, and in other ways sought to intimidate the men and force them to lay down their tools. Mr. Cotton brought the matter before the city council, where a lengthy debate resulted. Afeer a long discussion a unanimous decision was reached and a resolution passed to the effect that 48 hours per week should be allowed on city contracts, and in no case should the contractors be allowed to work their men except between the hours of 7 a.m. and 6 p.m.

The town council of Orillia, Ont., has received the report of the town engineer, Mr. W. K. Greenwood, on the reorganization of the town's utilities department. The report recommends that the utilities be divided into four departments: Waterworks and sewerage, electrical, roadways (including the town property), and parks. It recommends that the waterworks department should have a foreman, who should be familiar with the work to be done. In dealing with the roadways department, Mr. Greenwood recommends that in future the town should make use of broken stone, instead of gravel. The broken stone is very much better. There is plenty of material available in the country round, the town has a stone crusher which is idle most of the time, and power is cheap. He also recommends that the streets should be properly curbed at the corners, and crossings made at proper grade level, which would add very much to their appearance.

Railway Strike Affecting the Building Trade

The effects of the G.T.R. strike of conductors and brakesmen in delaying construction work have already been widespread.

At Montreal, where a strike of bricklayers is in progress, the situation has been rendered more complicated by a shortage of bricks.

In Toronto, the strike is holding up supplies of gravel, sand, cement and lime. No serious harm has yet been done but if the strike should be prolonged the result might be a costly interruption to building operations.

At Ottawa, the plumbers who were to have commenced work on the Chateau Laurier were unable to do so on account of lack of material, which was to have gone by G.T.R. from Montreal to Ottawa. The stonemasons on the same building were also threatened with a similar interference.

The Dominion Sewer Pipe Company, of Mimico, have begun to feel the effects of the strike by running short of clay. The G.T.R. found it necessary to spike all its switches leading from the main line between Toronto and Hamilton. This will make it necessary for the factory, along with many others, to close down. The Ontario Sewer Pipe Company is also forced to reduce its operations, involving the laying off of over 100 men. The Toronto Indestructible Brick Company expects to have to close down soon

Trade News from Montreal

Mason and Brick Strikers Losing Ground — Cement Becoming Scarcer—Railway Strike Affecting Supply Markets

Montreal Office of the "Contract Record."
August 1st, 1910.

The strike of Montreal mason and brick contractors has, if anything, lost ground during the past fortnight. The leading spirits among the strikers contend that they are meeting with success in their fight, but in moving about one cannot learn that the larger contractors are seriously handicapped for the lack of this class of laborer. Mr. John Stewart, of Messrs. John Stewart & Company, Westmount, declares that his company have lost very little time on any of its present contracts since the strike was organized, nor are any of the other contractors experiencing serious difficulty in getting all the men they require. Bricklayers and stonemasons are coming into the city, enticed by the opportunity afforded of obtaining work while the strike is on. The strike on the Grand Trunk is having its natural effect on the supply of bricks, which are now becoming very scarce. This latter condition has had the retroactive effect of hindering progress on a number of contracts, making less demand for the services of brick contractors. The report is also current at the present time that the local strikers have been informed that they need expect no further assistance from the International Union of the United States. The latter has its own troubles in Chicago and finds that these will create a sufficient drain upon their funds. It is further stated that the men are now going back and employers are making their own separate contracts.

And now the unions of sheet metal workers and roofers have decided that after September 1st their members shall not accept a less wage than 30 cents per hour. A conference with the master roofers is said to be pending, with what result it is impossible at this stage to predict.

Cement Situation.

There is a marked scarcity of cement at the present time on the Canadian market and conditions have been far from improved by the present strike on the Grand Trunk Railway tying up, as it has, a considerable portion of the freight traffic.

At the headquarters of the Canada Cement Company we learn that in order to meet their customers' requirements, they have in instances been compelled to ship from Montreal mills to Vancouver. Owing to summer scarcity the American market has made two sharp advances, yet the Canada Cement Company have kept to the low level prices. Prices are quoted as follows, f.o.b. Canadian centres (exclusive of cost of package): Montreal, $1.40; Toronto, $1.60; Fort William, $1.50; Winnipeg, $2.20; Calgary, $2.60; Ottawa, $1.40; Halifax, $1.50.

Mr. Frank P. Jones, general manager of the Canada Cement Company, is at present making a western business trip. It is expected that work will be commenced this year on the construction of the new mill at Winnipeg, to supply a portion of the cement required in the West.

Supply Markets

The strike on the Grand Trunk is not without its general effect on the supply market conditions. Cement continues in good demand with prices unchanged in spite of the marked scarcity. Bricks are no longer plentiful as in the earlier part of the season, when the market was in receipt of numerous shipments from the Eastern Townships. During the brick and mason contractors' troubles the demand was to some extent curtailed, but this was quickly counterbalanced by the loss in receipts occasioned by the railway strike.

Building Operations in St. Lambert

Building operations are in full swing at St. Lambert. "Brooklyn Park" is being boomed by an interested company and during the year a number of fine residences will be erected in this district. A number of tenement houses are also in project and the erection of this latter type of structure is an indication of the growth of the new city.

Remodelling of Carsley Property

A new hotel and restaurant will shortly occupy the old Carsley property on St. James street. A group of capitalists have purchased the building and rented it to Freemans, Limited, who will remodel the building and fit it up. The hotel will have about 130 rooms. Part of the ground floor facing on St. James street, will be sublet for business purposes.

The Carsley property now taken over by the City Central Real Estate Company, consists of about 12,800 square feet of land and the five-storey building thereon. In addition, the company have leased the adjoining premises on Notre Dame street from the Caverhill estate. This has an area of about 18,000 square feet. Mr. C. E. Deakin has the contract for making alterations to the present structure and has already commenced operations.

Must Only Comply With Building Laws

Mr. Recorder Dupuis last week gave judgment in the action of the city against J. B. Baillargeon for an injunction preventing him using a stable at the corner of Berri and Ontario streets. Mr. Baillargeon was refused a permit for the building by the city when he made application but commenced to build, and when the work was completed, used the premises as a stable. The city contended that as no permit was granted the building could not be used. The Recorder said that although no permit had been taken out, the defendant had complied with all the requirements of the city by-laws, and that being so, the city was bound to grant the permit. He dismissed the action.

Big Terminal Scheme

Mr. A. P. Gillies, C.E., and a party consisting of Messrs. F. M. Andrews, L. O. Hedden, A. E. G. Godridge, New York, F. E. Townsend and H. O. Eakins, Toronto, were in Montreal recently in connection with the matter of establishment of underground terminals in this city. Mr. Gillies and his company propose to construct these terminals at a cost of approximately $100,000,000. They have had extensive experience in similar enterprises at Tacoma and Cincinnati.

Larger Building Inspection Office

The Montreal Citizens' Association in recent session passed a resolution advocating that the city building inspector should at once be supplied with additional competent and responsible inspectors to aid him in the survey of new building, issuing of permits and enforcement of the city building laws. They contend in their resolution that the Building Inspector's Department should not wait until notified or requested to make inspections, but should be in a position to take the initiative and make thorough and careful examinations of all buildings which might offer danger to the public's safety.

The Citizens' Committee also take exception to a recent private inspection of Montreal's water tanks. Their contention is that such a private inspection by any one whom the interested parties would choose would offer little or no protection to the public.

Longueuil Alters Building By-laws

The council of Longueuil recently made some additions to the town building by-laws. In future buildings must be at least two storeys in height and when frame buildings are

The Best HOIST in Canada

Note Well the Exclusive Features

The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

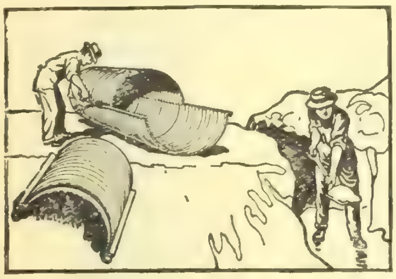
Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal

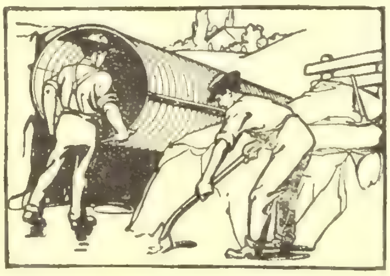
Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.



PEDLAR
NESTABLE GALVANIZED
CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivalled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

HALIFAX	LONDON	WINNIPEG	MONTREAL	PORT ARTHUR	OTTAWA	TORONTO
16 Prince St.	86 King St.	76 Lombard St.	321-3 Craig St.	45 Cumberland St.	423 Sussex St.	111-113 Bay St
CHATHAM	QUEBEC	REGINA	CALGARY	VICTORIA	ST. JOHN N.B.	VANCOUVER
200 King St. W.	127 Rue du Pont	1901 Railway St. S.	1112 First St. W.	434 Kingston St.	42-46 Prince William St.	821 Powell St.

Phone Main [illegible]

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheet
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime.

FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

erected these must be spaced 15 feet at least from adjoining buildings.

Notes

The work of dredging out the channels and building up the land extension for the new docks and shipyards at Maissonneuve is progressing rapidly.

Mr. R. S. Lea, consulting hydraulic engineer, has returned from a trip through Western Canada and will shortly leave again on a similar expedition.

Mr. Frank P. Jones, general manager of the Canada Cement Company, Limited, is at present on an extended trip through the west in the interests of his company.

Mr. A. N. Schensnovitch, a prominent civil engineer from Novorossusk, Russia, is in Montreal, for the purpose of studying local facilities and methods of handling grain.

The Board of Control have empowered City Surveyor Barlow to prepare a report covering the question of street car fenders, with a view to obtaining a more efficient and protective system for Montreal.

Mr. Alcide Chausse, city building inspector, has been made a Licentiate of the Royal Institute of British Architects. To Mr. Chausse falls the honor of becoming the first French-Canadian member of this British association.

The excursion of the Montreal Board of Trade to Vancouver projected for the coming fall has been cancelled owing to the requisite number of excursionists not having been forthcoming to ensure the success of the trip.

Mr. John Morrow has been appointed chief real estate agent for the Canadian Pacific Railway Company, with offices in Montreal. Mr. Morrow has been in the employ of the company in different capacities since 1885.

A satisfactory inspection of the St. Lawrence ship channel between Montreal and Quebec as far as Beaujeu Bank and L'Islet, was recently made. Included in the party were Messrs. W. A. Wiallard, Montreal representative of the Marine & Fisheries Department; Albert Laforest, resident engineer, Montreal; A. Chatigny, engineer in charge of buoy service, Montreal; V. W. Forneret, superintendent of the ship channel, Sorel; Charles Basinet, superintendent construction department; L. G. Papineau, H. A. Terrault, ship yard department, Sorel, and P. E. Parent, resident engineer, Quebec.

Personal Mention

A. J. Rattray, architect, Toronto, has left for New York and will spend a fortnight's holiday at the seashore.

Mr. H. W. Baker, the new publicity commissioner for the city of Ottawa, has taken up his duties and is expected to commence shortly upon a programme for attracting new industries to the Capital.

James L. Carleton, inspector of permanent pavement work for St. John, N.B., has resigned his position as he believes the pavements which are being laid down are not within 50 per cent. as good as concrete mixed according to the specifications would be. It is probable that his resignation will lead to an investigation.

Rodolphe C. Desrochers, who has been assistant secretary of the Department of Public Works at Ottawa for some years, has been appointed to the vacancy in the position of secretary of the department which resulted from the death of the late Napoleon Tessier. Mr. Descrochers entered the service in January, 1902. He was appointed assistant secretary in 1906 and is regarded as being eminently qualified for the position, which he has been filling in an unofficial manner for some months.

Mr. G. Frederick W. Price, assistant city architect for the city of Toronto, met with a painful accident in Prince Edward County about 13 miles from Picton recently while driving his automobile, with a party of relatives. The machine struck a stone and stopped so suddenly that Mr. Price was hurled through the glass window. The other members of the party were shaken up but not injured. Mr. Price's injuries were not serious but he was unconscious from 10 a.m. to 3 p.m. The auto was badly smashed. Mr. Price was able to resume his duties a few days later. He has given notice of his intention to sue the county for damages on account of the defective roadway.

Canadian City Engineers

D. McD. Campbell, Sydney, N.S.

The accompanying illustration is an excellent portrait of Mr. D. McD. Campbell, the well known city engineer of Sydney, N.S., under whose direction the work of the department has been carried on with much success. Mr. Campbell is still a young man, having been born at Salmon River on November 1st, 1878. He is of Highland Scotch descent and was brought up on a farm, where he was accustomed to hard work from boyhood. He was educated at Truro Academy and entered Dalhousie College in 1894, from which he graduated with the degree of Bachelor of Arts in 1898 and Bachelor of Science in 1900. In his science course he devoted his studies to civil engineering, taking honors in pure and applied mathematics. He was granted the degree of M.A. in 1904 for further work in mathematics. Mr. Campbell's professional career was commenced immediately after graduation, when he entered the service of the city of Sydney as assistant engineer. During his service a complete sewerage system has been built for the city and an extensive water improvement scheme was carried out, in addition to the usual general municipal work. Mr. Campbell was appointed city engineer and building inspector in June, 1908, and has continued in this position up to the present, giving excellent satisfaction to the city.

D. McD. Campbell, City Engineer of Sydney, N.S.

In the "Contract Record" of July 20th, A. B. Ormsby Limited, Toronto and Winnipeg, were credited with having done the roofing and sheet metal work on Winnipeg's new union passenger depot. This should have been credited to A. Schwoerer & Sons, Inc., of New York.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

"The durability of a building is the gauge of its value from an economic standpoint."
—The Philosopher of Metal Town.

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality OLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

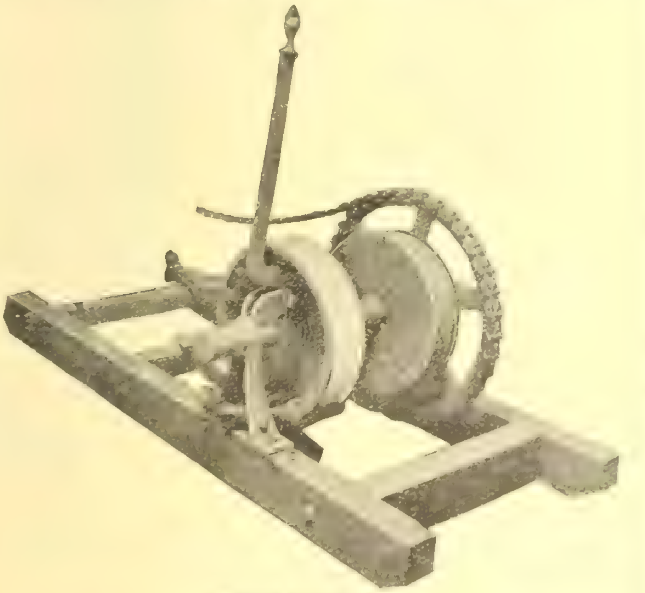
Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

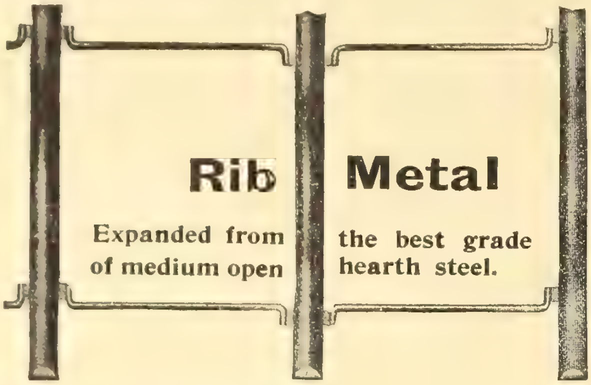
Write to

Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



Rib Metal

Expanded from of medium open the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

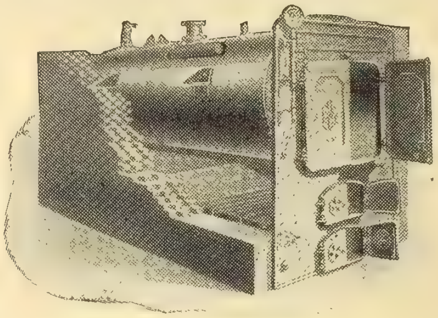
The Calkins Tile & Mosaic Co., Limited

Wall Tiles, Hexagon Floor Tiles, Quarries, Ceramic Mosaic, Marble Mosaic

Interior Marble, Slate and Granite Work

The
Smith Marble & Construction Company, Limited
458 Bleury Street, Montreal

STEAM HEATING BOILERS



OF ALL SIZES
FOR
Public Buildings

Manufactured as a Specialty

Quotations and Information given by

E. LEONARD & SONS, Engine and Boiler Manufacturers, **LONDON, ONT.**

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

ESTABLISHED 1886
Contract Record
In which is incorporated
Architect & Builder

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, Confederation Life Building, Toronto.

JAMES BRODIE & CO.
Quarriers and Manufacturers of
Canadian Quinsy, Ebony and Stanstead Granite
Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty
IBERVILLE, QUE.

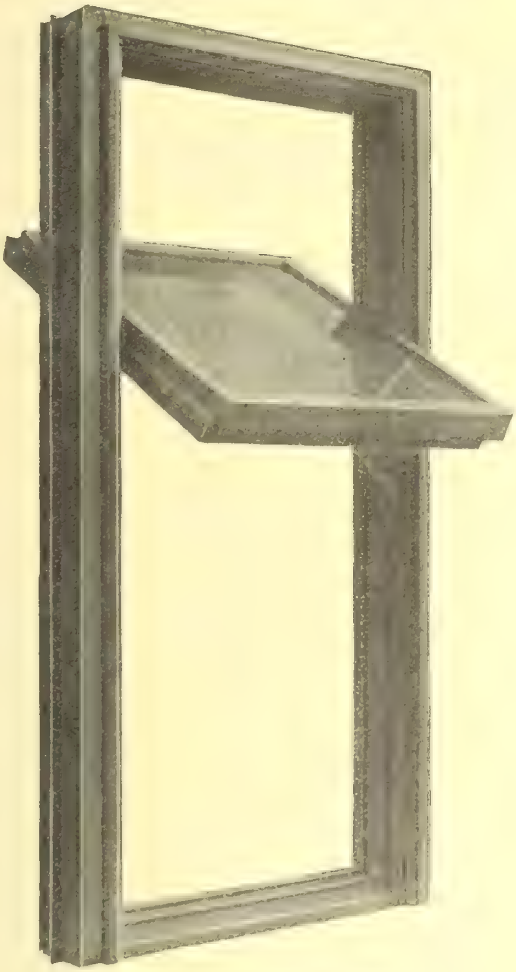
Cumberland County Quarries
Red and Grey Freestone
Oakley Myers, Amherst, N.S.
Hardens with Age. Low Price. Samples and Quotations Free

Reasons why

you should specify

DOUGLAS BROS.

FIREPROOF WINDOWS



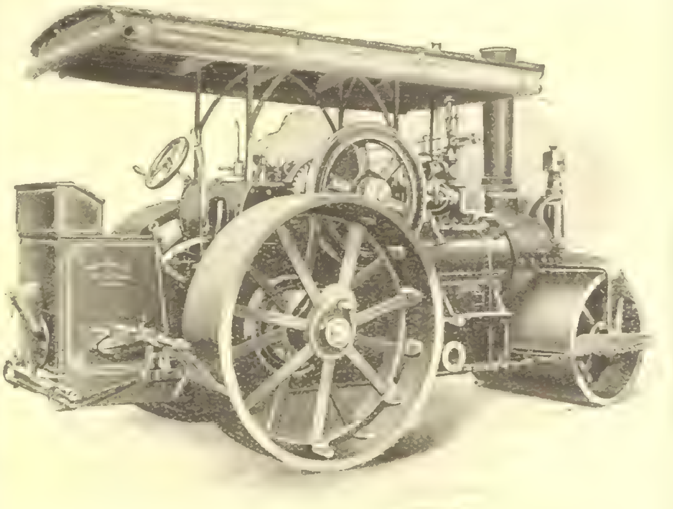
View of Double Hung Window

Easy to handle.
Mechanically perfect in construction.
Rigid and easily glazed.
Simply made and easily adjusted.
Made in a model factory by special machinery and skilled workmen.
And always delivered on time.
Other reasons will be found in our catalogue.

SEND FOR A COPY

Douglas Bros., Limited
TORONTO, Ont. MONTREAL, Que.

A Double Cylinder, Double Crank Roller



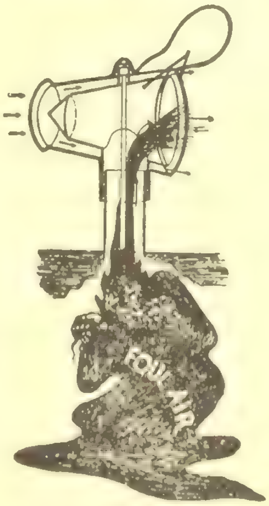
The Waterous

A Canadian Roller for Canadian Roads

This Roller is known as "a Good Roads Pioneer" from Vancouver to Sydney. Fully illustrated and described in our new 20 page catalogue No. 301. Send for it.

The Waterous Engine Works Co., Limited
BRANTFORD, CANADA

AUTOFORCE VENTILATING SYSTEM



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

Sole Licensees and Manufacturers for Canada

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone : Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

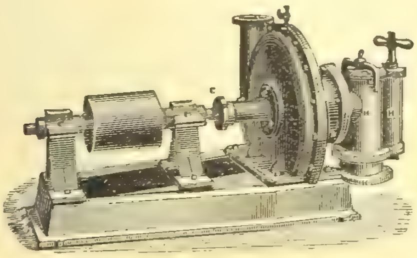
Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

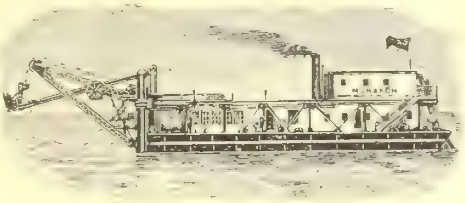
M. Beatty & Sons, Limited **Welland, Ontario, Canada**

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

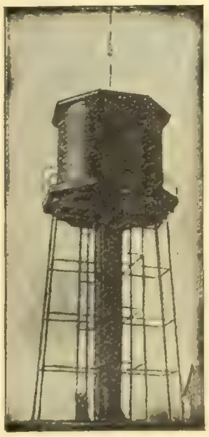
Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., **TORONTO**
Office Phone P. 64 Residence P. 1040



Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!
The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material, best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF
GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS
We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

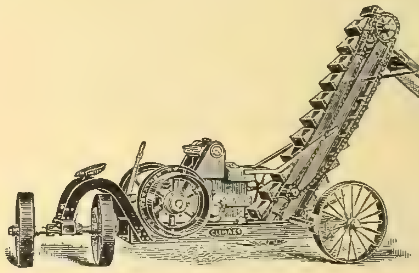
"Architectural Finishes and Stains"

That's the title of **a nickel steel bound book** that every architect and contractor should have. It is published by **The International Varnish Company, Limited,** and is mailed absolutely free of charge to the address of the architect or builder who wants **more** and **better** business. The book contains plain facts about Elastica Finishes and Kleartone (acid and oil) Stains every builder and architect should know. More than that it actually demonstrates their unvarying excellence and superiority convincingly. Send for a copy today and know exactly why most prominent Architects and Builders specify and endorse International Varnish Products.

Sold in Imperial Measure Cans only

INTERNATIONAL VARNISH CO.
Limited
Toronto Winnipeg
2508

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER.

All sizes ready for shipment.
Catalogues furnished on application.

The
Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

CAST IRON PIPE

3 inches to 60 inches diameter
for Water, Gas, Culvert and Sewer
HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

SUCCESSORS TO:
Canadian Iron & Foundry Co., Limited
Canada Iron Furnace Co. Limited
Annapolis Iron Co., Limited
John McDougall & Co., Drummondville

Head Office: Montreal, P. Q.

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc. Castings of All Kinds.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

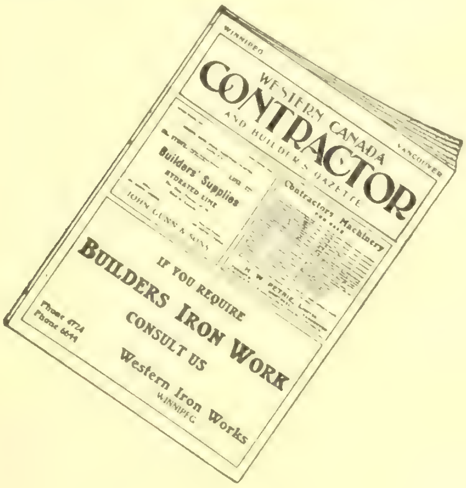
ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

SAND and GRAVEL
a Specialty

We have the above in various grades ready for immediate delivery.
Let us quote on your requirements

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664 665 Evenings, North 2107 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The Dennis Wire & Iron Works Co.

London, Canada Limited

Toronto Office: 103 Pacific Bldg.

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

---

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited

9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

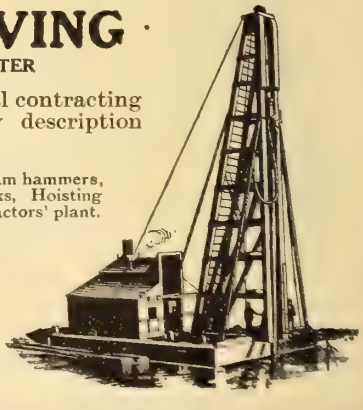
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper, but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal. Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Summer Contracts

Architects and contractors who are desirous of making or of keeping a good reputation will act in their own interests by specifying

Port Credit Brick

We have recently made extensive enlargements and improvements to our plant and have now one of the finest equipments in America.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

THE COMMERCIAL
The Weekly Financial Commercial & General Trade Newspaper of the Great West.
Winnipeg Manitoba

Sand & Supplies
LIMITED
Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite
Crushed Stone and
Sewer Pipe

M. 4507

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The
KATIE
Foundry,
Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Western Lumberman

Representing the Lumbering and Woodworking interests of British Columbia Alberta Saskatchewan and Manitoba

Winnipeg, Manitoba

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE TAMCO MARK

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St. Montreal
Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work	$10.00 to 11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾ inch square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 80 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Alfred Mitchell, sawmill owner Powassan, Ont., has advertised his business for sale.

Smythe Bros., saw mill owners, Aldina, Sask., are stated to have dissolved.

Alex. McKay & Company, plumbers, Montreal, Que., are stated to have dissolved.

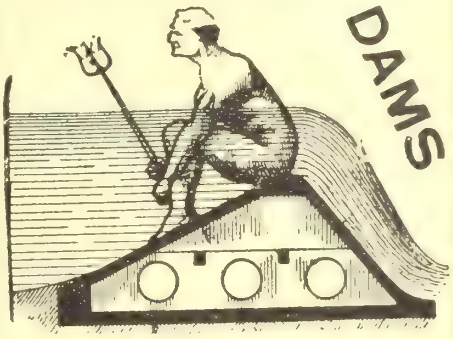
H. J. Lindal, lumber manufacturer, Leslie, Sask., has been succeeded by G. R. Calkins.

It is stated that D. Nevin & Company, saw mill owners, Chilliwack, B.C., have dissolved. W. Braithwaite retiring.

Brandon Brick & Lumber Company, Limited, Brandon, Man., name changed to Brandon Sandstone Brick Company, Limited.

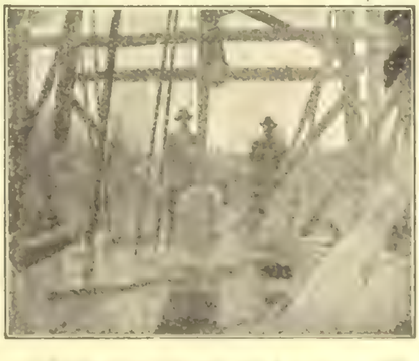
Haney, Quinlan and Robertson, Montreal, have begun operations on sections 4 and 6 of Trent Canal. Office at Campbellford, Ont.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world**.

AMERICAN

ALSEN
CEMENT
45 BROADWAY, NEW YORK

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

GERMAN

Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections

See page 155 in "Sweet's" for full particulars.

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

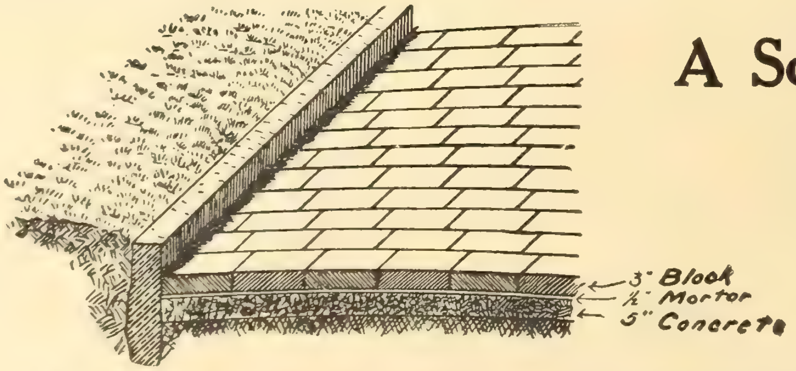
The Last Word in Wire Lathing

1910 **Patented Trussed** 1910

Wire Lath

FOR DESCRIPTION AND PRICES
APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

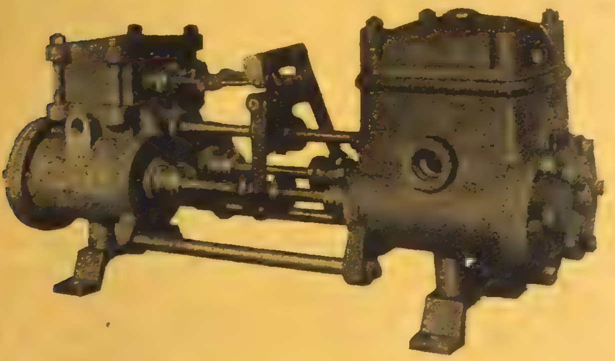
Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING
AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.
Metropolitan Building, NEW YORK.
Local Agents in Montreal, Toronto and Ottawa.

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR **S** BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

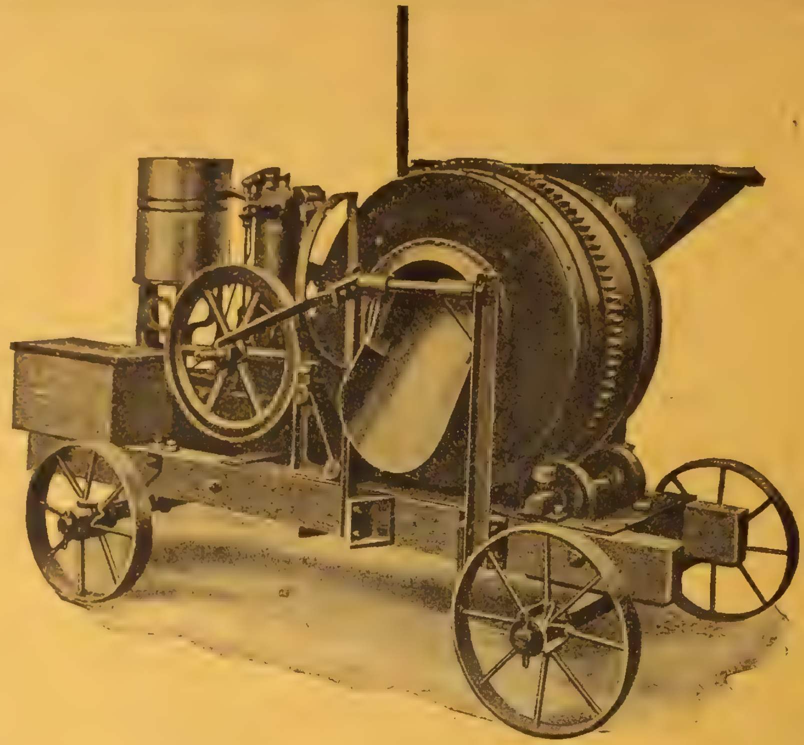
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



This is Every Man's Mixer

NO. 4 RANSOME—NEW 1910 MODEL

At last the demand for a really **small** concrete mixer is satisfied. Hold on, now, Mr. Big Contractor, that doesn't let **you out**, either. This is **Every Man's Mixer**—the mixer that fits into everybody's need. There isn't a concrete job on earth so small that it can't be done better and cheaper with this new model No. 4 Ransome, and there isn't a contractor anywhere whose work is so big that he will not find it a convenience and an economy to have one of these little No. 4's in addition to his larger machines. The No. 4 can be used on the small, isolated parts of jobs where it wouldn't pay to move a big machine.

Everybody who builds concrete walls, concrete walks, concrete **anything**, can have the best concrete that can be made at the least possible cost, because our new No. 4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an **exact reproduction,** on a small scale, of the Ransome that made the correct mixing of concrete **cheap**—it's the same wonderful mixer in miniature. This is **the first really modern, effective, and economical small mixer ever put on the market.**

The following description of the No. 4 Ransome will show you what a truly **complete** and highly efficient mixing outfit you can buy at a very low price.

It has a batch capacity of 4 cubic yards per hour, which is ample for any small concrete job.

It is made and sold in **one way only,** i.e., **mounted on trucks,** with a Gasoline Engine, **direct drive.** This is a powerful engine for its rated H.P. and the best designed—a most perfect-operating engine.

The No. 4 is fully equipped with **Gasoline Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates** and All Necessary Engine and Mixer Fittings—**an absolutely complete outfit, ready for perfect operation.**

The Drum is 36" in diameter and 24½" in length, and has a speed of 24 revolutions per minute.

For its size this is the most substantially built mixer. The drum plates are ⅛" thick; the scoops ⅛" thick; the counter shafts 1 7/16"; the traction rings ½"; face of traction rings 1½".

The mixer has only 16 parts all told and **only four wearing parts.** It is the Extreme of Simplicity—you can keep one extra part on hand—a journal. The journals are the only wearing parts. No danger of breakdowns. It is everlastingly durable and reliable.

The No 4 Ransome is a great time saver in every respect. The charging hopper is being filled **while the batch is mixing,** so that no time is lost in charging The batch is instantly discharged by merely reversing the discharge chute.

It is also a great economizer of **time** and **labor** because it is **not a tilting mixer**—it needs no room for clearance—is mounted several feet lower than any tilting mixer—a great saving in time and labor of elevating the materials into the mixer

The No. 4 Mixer is equipped with a series of blades or scoops inside the drum, which produce a rubbing-grinding contact of the particles in the concrete, a combination of rolling contact with forcible kneading. Being the same in this respect as the larger Ransomes, it follows that the user of the new No 4 Ransome, although mixing in small batches, will get precisely the same **intimate** and **thorough** mixture for which the Ransome is unique The user of a No. 4 may know positively in advance that his concrete will be a perfect, uniform mixture—sound throughout—no unmixed spots anywhere—no danger of the concrete crumbling after setting.

Because of this thorough mixing, the No. 4 Ransome permits of **real cement economy.** It will give **maximum** strength with the **minimum** cement countenanced by engineers.

The new 1910 Model No. 4 Ransome is small, compact, easily **portable.** Mixer, engine, and trucks complete, weigh 1750 lbs.

We carry No. 4's in our Warehouses for immediate delivery. Write for price, terms and additional information.

We give with each of these mixers an absolute and unequivocal **guarantee** that the No. 4 Ransome under equal conditions will mix more concrete, mix it better, in less time, and with less labor, repairs and expense, than any other mixing device.

F.H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, August 10, 1910 No. 32

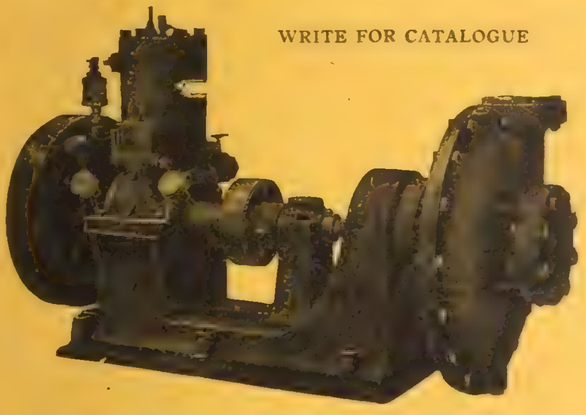
ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps, Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE



The **Smart-Turner Machine Company** Limited
HAMILTON, CANADA

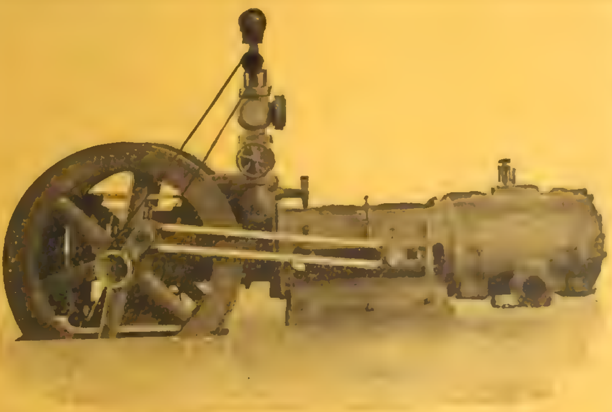
"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

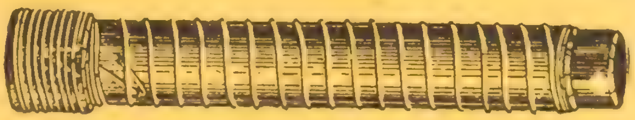


CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity Efficient Regulation
Large Bearings Rigid Construction

Ask for Descriptive Catalog K 81

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

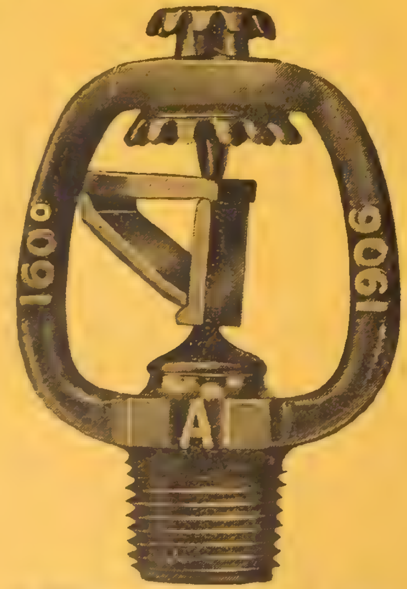
General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

$20,000,000.00!



The "Rockwood" Approved by all Canadian and American Insurance Associations

Canada's Annual Fire Loss. What Proportion Do You Pay?

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums

For particulars and free estimates communicate with

The Rockwood Sprinkler Co., of Canada, Limited, Montreal

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Automatic Sprinklers Page
Rockwood Sprinkler Co. 2

Architectural Iron Work
Canada Wire Goods Mfg. Co. 15
Dennis Wire & Iron Works 58

Boilers
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 52
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co 63
Waterous Engine Works Co. ......

Brick
American Enamelled Brick Co. ......
Canadian Pressed Brick Co. 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co 5
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co. ......

Bridges (Steel)
Canadian Bridge Co. 18
Cleveland Bridge Co. 18
Dickson Bridge Works ......
Dominion Bridge Co 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware
Taylor-Forbes Co. 63

Cement
Alsen Portland Cement Co. 62
Britnell & Co 58
Bremner, Alex 57
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 60
Rogers, Alfred 4
Rogers Supply Co 31
Sand and Supplies 59
Stinson-Reeb Builders Supply Co. 58

Conduits Page
Conduits Co., Limited 58

Concrete Mixers and Machinery
Canada Foundry Co 14
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F. H 64
Jenckes Machine Co 2
London Concrete Machinery Co. 21
Mussens Limited 32
Morrison & Co., T. A 60
Rogers Supply Co 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co. 19
Canada Wire Goods Mfg. Co. 15
Hamilton Iron & Steel Co. ......
Trussed Concrete Steel Co. 52

Contractors' Plant
Beatty & Sons, M. 13
Hepburn, John T. 17
H. & E. Lifting Jack Co. ......
Hopkins & Co., F. H 64
Katie Foundry Co 60
Marsh & Henthorn 52
Mussens Limited 32

Crushers (Stone and Rock)
Hopkins & Co., F. H. 64
Jenckes Machine Co 2
Mussens Limited 32
Morrison & Co., T. A 60

Corrugated Iron
Galt Art Metal Co. ......
Metallic Roofing Co 53
Metal Shingle and Siding Co. 20
Ormsby, A. B., Limited 5
Roofers Supply Co. 13

Contractors Page
McIlwraith, Jas. A. 60

Drills
Beatty & Sons, M 13
Canadian Rand Co. 1

Deafening Felts
Cabot, Samuel, Inc. 59

Drilling Contractors
Harvey, J. 61

Dredges
Beatty & Sons, M 13

Engines
Inglis, John 22
Jenckes Machine Co 2
Mussens Limited 32
Waterous Engine Works Co. ......

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co. 34

Engineers (Civil and Mechanical
Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Davis & Johnston 60
Farmer, John T. 60
Fuce, Edw. O. 60
Galt Engineering Co., John 60
Glaubitz, H. J 60
Hunt & Co., Robt. W. 59
Inglis, John 22
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H. 60
McRae, John B 60
Moore & Scollan 60

Fire Apparatus Page
Morrison & Co., T. A. 62
Seagrave, W. E 58

Fireproof Doors and Windows
Douglas Bros 16
Mussens Limited 32
Ormsby, A. B. 5

Granite and Marble
Laurentian Granite Co. 60
Missisquoi Marble Co. ......
Rogers Supply Co. 31
Smith Marble & Construction Co. ..

Glass
Chance Brothers & Co. 8
Consolidated Plate Glass Co. ......
Luxfer Prism Co. 5
Thompson & Co., B. & S. H 8
Toronto Plate Glass Importing Co. .. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. ......
Tavlor-Forbes Co 63

Hoisting Machinery
Beatty & Sons, M. 13
Inglis, John 22
Jenckes Machine Co. 2
Hopkins & Co., F. H. 64
Marsh & Henthorn 52
Mussens Limited 32
Scott Machine Co 5

Hydrants
Canada Iron Corporation 57
Gartshore-Thompson Pipe Co. 56
Kerr Engine Co. ......

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contracror who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited
100 King Street West, TORONTO

They look like wood but they are fireproof

Our KALAMEINED CLAD DOORS are made in any design, finished in any color, **no bulging**, no nail heads and yet they are Fireproof and mean a reduction in Insurance Rates. The largest and best office buildings and apartment houses in the country have installed them, and have found them a valuable investment.

Let us give you approximate figure on these goods.

A. B. ORMSBY, Limited

Factories
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	51
B[illegible] Lumber Co	10
DeLaplante, Ltd	20
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	63
Rhodes, Curry & Co	
Sanitary Floor Co	57
Siemon Bros.	51
Standard Mills, Limited	62
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	
Metallic Roofing Co	53
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co.	15

Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	19
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	63
Britnell & Co	58

Pipe

Canadian Pipe Co.	56
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	56
Municipal Construction Co.	17
National Iron Works	57
Pacific Coast Pipe Co.	1
Pedlar People	13

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	59
Glidden Varnish Co.	
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	58

Pumps and Pumping Machinery

Beatty & Sons, M.	13
Goulds Pump Co.	16
Hopkins & Co., F. H.	64
Inglis Co , John	22
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	55
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials

Barrett Mfg. Co.	
Brantford Roofing Co	11
Galt Art Metal Co.	
Metallic Roofing Co.	53
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	13

Railway Supplies

Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	14
Case Threshing Machine Co.	55
Climax Road Machine Co.	56
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	54
Britnell & Co	58
Canada Iron Corporation	55
Dominion Sewer Pipe Co.	54
Gartshore-Thomson Pipe Co.	54
Hamilton & Toronto Sewer Pipe Co.	55
National Iron Works	57
Ontario Sewer Pipe Co.	10
Rogers Supply Co.	31
Standard Drain Pipe Co.	54
Toronto Pottery Co	54

Sand

Rogers Supply Co.	31
Sand & Supplies	57

Stone

	Page
Britnell & Co.	54
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	13
Corinthian Stone Co.	15
Crushed Stone, Limited	59
Doolittle & Wilcox	57
Hagersville Contracting Co.	5
Laurentian Granite Co.	69
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	63
Robertson, D	59
Rogers Supply Co	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	59
Wiarton Stone Quarry	61

Structural Iron and Steel

Buffalo Steel Co.	19
Dominion Bridge Co.	18
Hamilton Iron & Steel Co.	
MacKinn n Holmes & Co.	
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60

Shovels (Steam)

Beatty & Sons, M.	13
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	59

Slate

Roofers Supply Co.	13

Steel Shingles and Ceilings

Galt Art Metal Co.	

Safes and Vaults

Taylor J & J	19

Sheathing Papers

Cabot, Samuel, Inc.	59

Telephone Supplies

Northern Electric & Mfg Co.	34

Tiles

Smith Marble & Construction Co.	

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	52
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	19

Typewriters

United Typewriter Co.	62

Valves

Canada Iron Corporation	57
Gartshore-Thomson Pipe Co.	56
Kerr Engine Co.	8
Standard Fitting & Valve Co	63

Ventilating System

Gardiner & Gaskill	

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	59

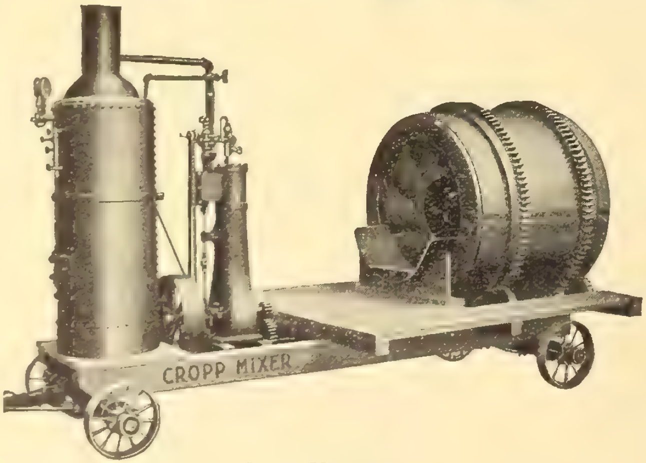
Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	56
Smith, Thos. & Wm.	12

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	15

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Don Valley Bricks

and Porous Terra Cotta Fireproofing

DON

TERRA COTTA

DON

DON

TERRA COTTA

DON

Pile of Fireproofing

Be sure and specify "Don Valley Terra Cotta Fireproofing" on every job, its value has been proved.

We also market brick of every desirable size, color, shape and quality.

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: David McGill, 206 Merchants Bank Chambers

Chance's Famous Figured Rolled Glass

(Registered No. 545694)

To Architects, Builders and Contractors we will send, on request, samples of the Glass manufactured by CHANCE BROS. & CO., Limited, near Birmingham, England. Samples include Figured Rolled, Muffled and Rolled Cathedral Glass, in a variety of patterns and tints.

The "Maple Leaf" pattern, shown above, is one of our newest and most popular.

Write now for these samples. You'll probably find among them just the glass for which you have been looking.

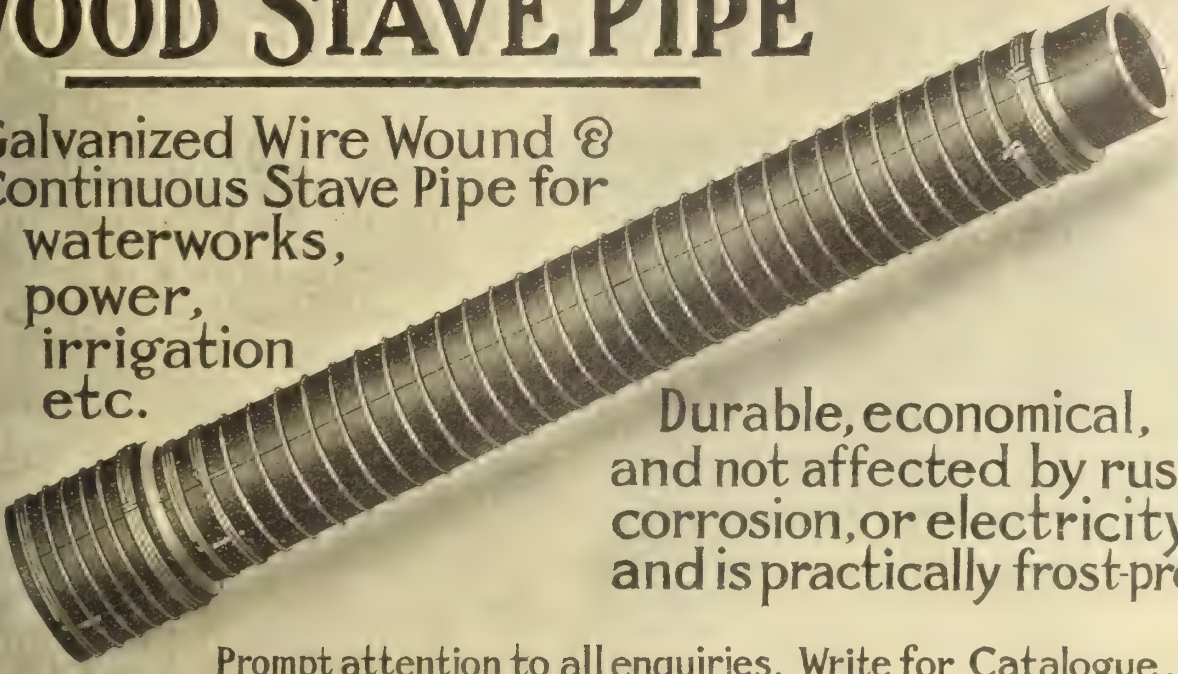
Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

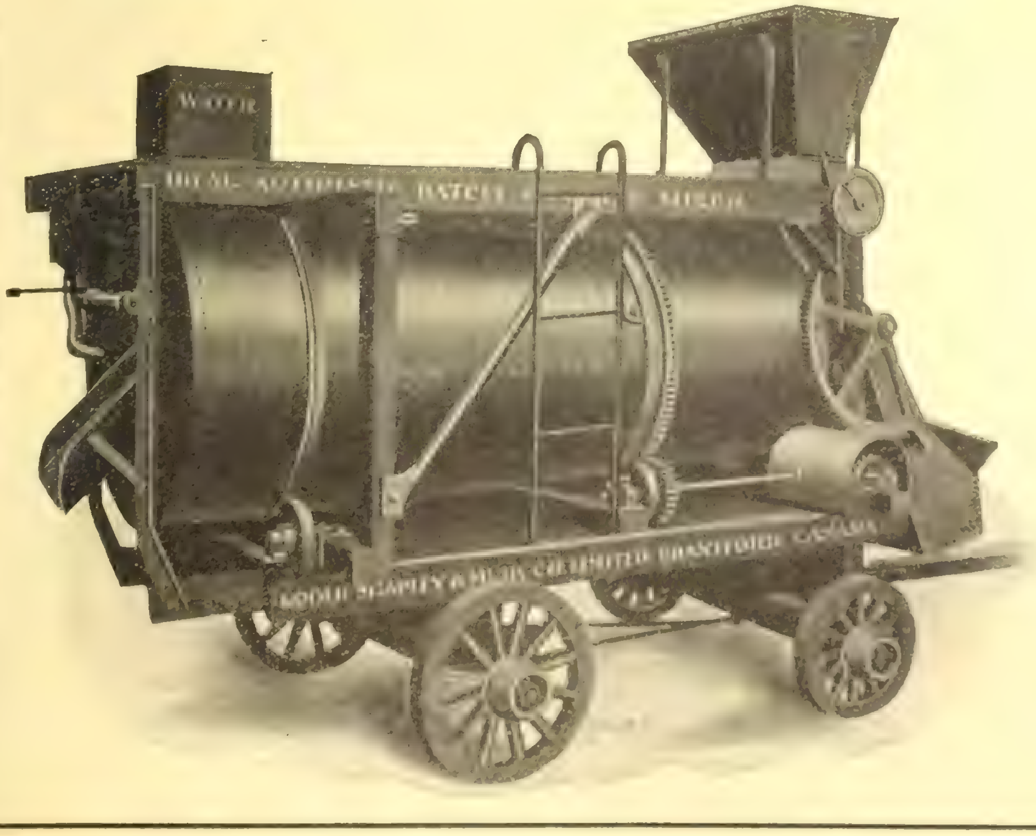


Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer



Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**

THE PIPE that makes the **SEWER SURE**

Mimico Pipe

is the

Recognized Standard

on the

Canadian Market

Hot Air Helps Make Them
but
Is Not Needed To Sell Them

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

Toronto Officials Recognize the Fire-Resistant Qualities of

Brantford Roofing

Along with slate and iron, Brantford Roofing is accepted by the City Architect and Chief of the Fire Department for use in the most congested district in Toronto. We have a certificate to that effect. Do you know of any other ready roofing that has such a certificate? We think not.

The Toronto officials recognize a REAL fire-resistant roofing when they find one. So do the fire-insurance companies. They give lower rates for buildings covered with Brantford Roofing.

These facts are worthy of a builder's or contractor's most careful consideration when selecting or specifying roofing material for his contracts.

Send for interesting Roofing Book and Samples.

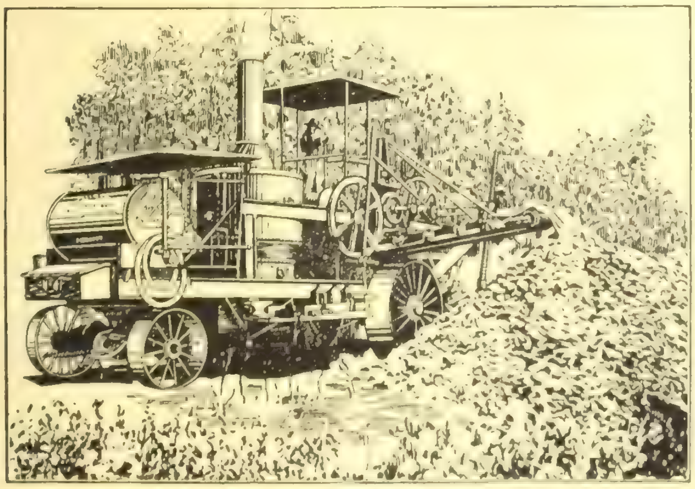
Brantford Roofing Company, Limited

Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

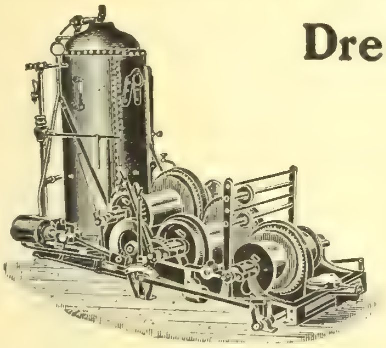
M. Beatty & Sons, Limited

Welland, Ontario, Canada

Dredges - Ditchers - Derricks

Steam Shovels

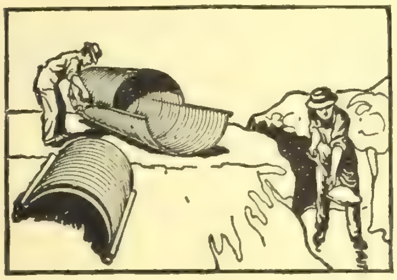
Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

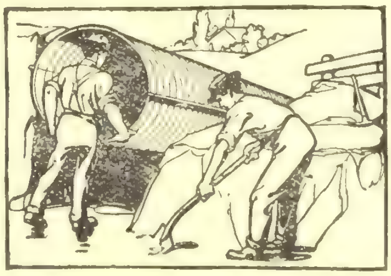
Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.



PEDLAR
NESTABLE GALVANIZED
CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivelled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert. Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

HALIFAX 16 Prince St.
LONDON 86 King St.
WINNIPEG 76 Lombard St.
MONTREAL 321-3 Craig St.
PORT ARTHUR 45 Cumberland St.
OTTAWA 423 Sussex St.
TORONTO 111-113 Bay St.
CHATHAM 200 King St. W.
QUEBEC 127 Rue du Pont
REGINA 1901 Railway St. S.
CALGARY 1112 First St. W.
VICTORIA 434 Kingston St.
ST. JOHN N.B. 42-46 Prince William St.
VANCOUVER 821 Powell St.

Phone Main 6865—6866

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

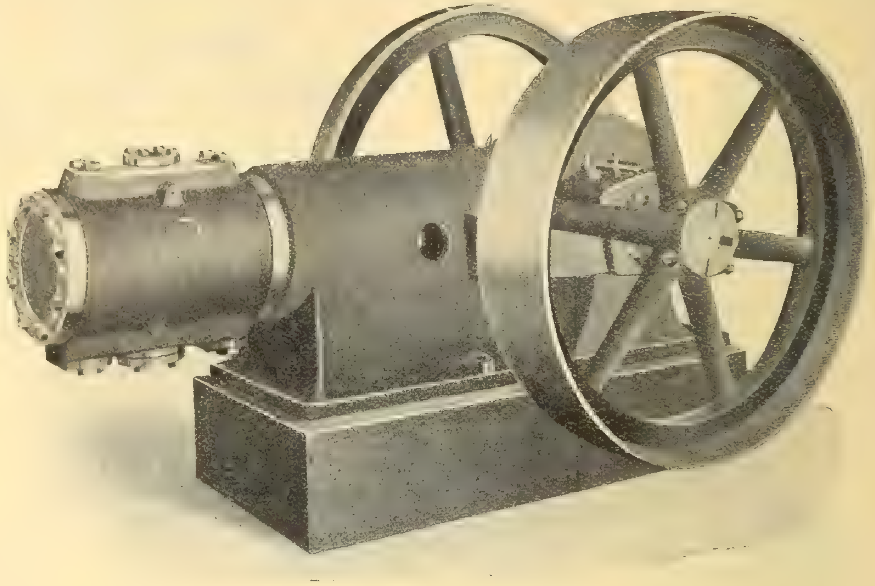
CRUSHED STONE—Dimension and Coursing Stone, Lime.

FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859



Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.

Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

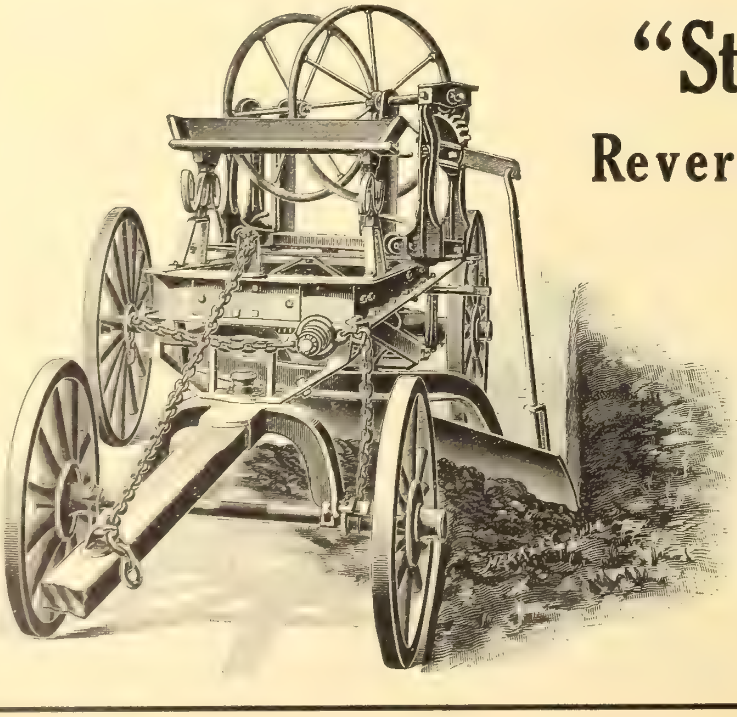
Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery



Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK
WIRE CLOTH AND WIRE GOODS

Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low Quality is High

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless, fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc., has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples.

The Sanitary Floor Co.
544-546 King Street West. - Toronto, Ont.

CUT STONE
All kinds of Canadian and American Stone

D. ROBERTSON & CO.
Limited

Offices
[illegible] Yonge Street, TORONTO
MILTON, Ont.

Quarries
MILTON
CREDIT FORKS

Yard
Manning and Dupont, TORONTO

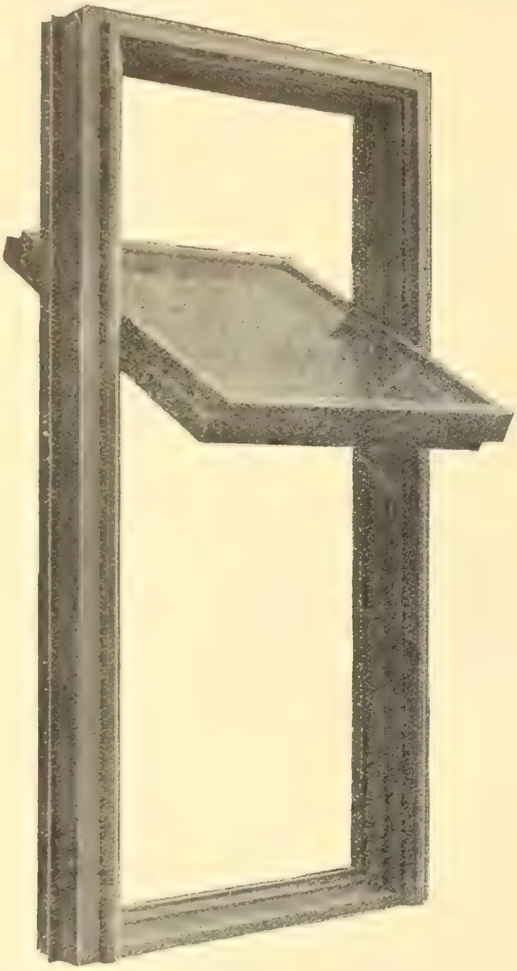
Telephones:
[illegible]

Reasons why

you should specify

DOUGLAS BROS.

FIREPROOF WINDOWS



View of Double Hung Window

Easy to handle.
Mechanically perfect in construction.
Rigid and easily glazed.
Simply made and easily adjusted.
Made in a model factory by special machinery and skilled workmen.
And always delivered on time.
Other reasons will be found in our catalogue.

SEND FOR A COPY

Douglas Bros., Limited
TORONTO, Ont. MONTREAL, Que.

Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

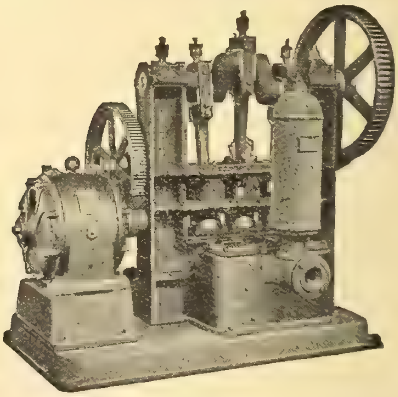
We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.
Coristine Building, Montreal
Phone Main 1054
Works: Seneca Falls, N.Y.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE
All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

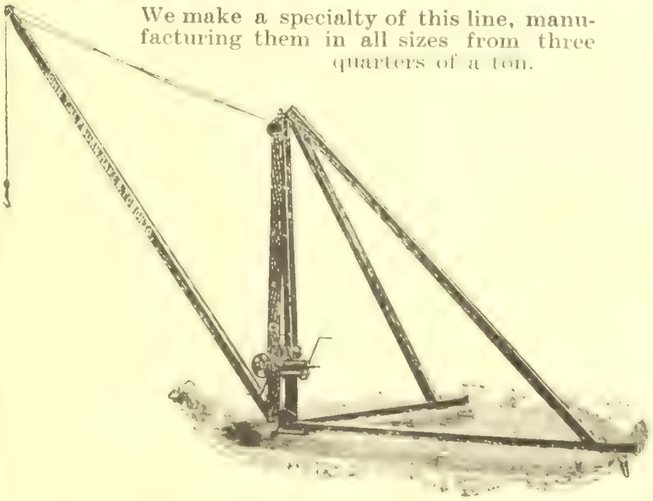
is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 **TORONTO**

Branches Vancouver and Winnipeg
Montreal

The

Phœnix Bridge & Iron Works

MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**

Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

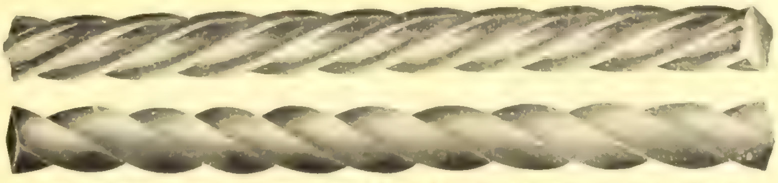
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. (Suburb of Buffalo, N. Y.)

Toronto Office
117 Home Life Building

You would think it is a board,

wouldn't you? It's not. It is a 27 gauge sheet of

Herringbone Lath

taken from stock. It is by far the stiffest lath on the market—so stiff it is used just like wood lath on sixteen inch stud spacing. Cheaper laths take more plaster and require more wood framing.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

The mails are bringing us record-breaking orders for

PRESTON SAFE-LOCK SHINGLES

We wish to thank the builders and contractors for the many orders they are giving for PRESTON Safe-Lock Steel Shingles. We are glad that the superior merits of PRESTON Shingles are recognized by the building trade.

We have done everything in our power to make PRESTON Safe-Lock Steel Shingles the top-notch roofing material. They are made and galvanized according to British Government specifications. They are safe-locked on all FOUR sides. They are unaffected by strains due to shrinking of sheeting or settling of building. Completely proof against rain, snow, wind, fire and lightning.

A booklet explaining their superior construction will be mailed free on request.

Metal Shingle and Siding Company, Limited
Preston, Ont.

Branch Office and Factory:
Montreal, Que.

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

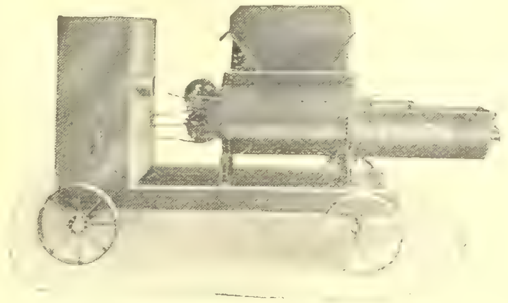
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers



Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save You Money
On the first cost of machine
On cost of operation
On cost of mixing concrete

Meet us at Toronto Exhibition, we will have the largest exhibit of Concrete Machinery ever shown (on the Ground south-east of Machinery Hall.)

We also manufacture a Standard Drum Batch Mixer in three sizes, one-third yard, one-half yard and one yard. The most complete Drum Mixer [illegible] We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company Limited

19 Marmora Street, London, Canada

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia.
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.
A. G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada

---

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is [illegible] inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilating the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horror.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

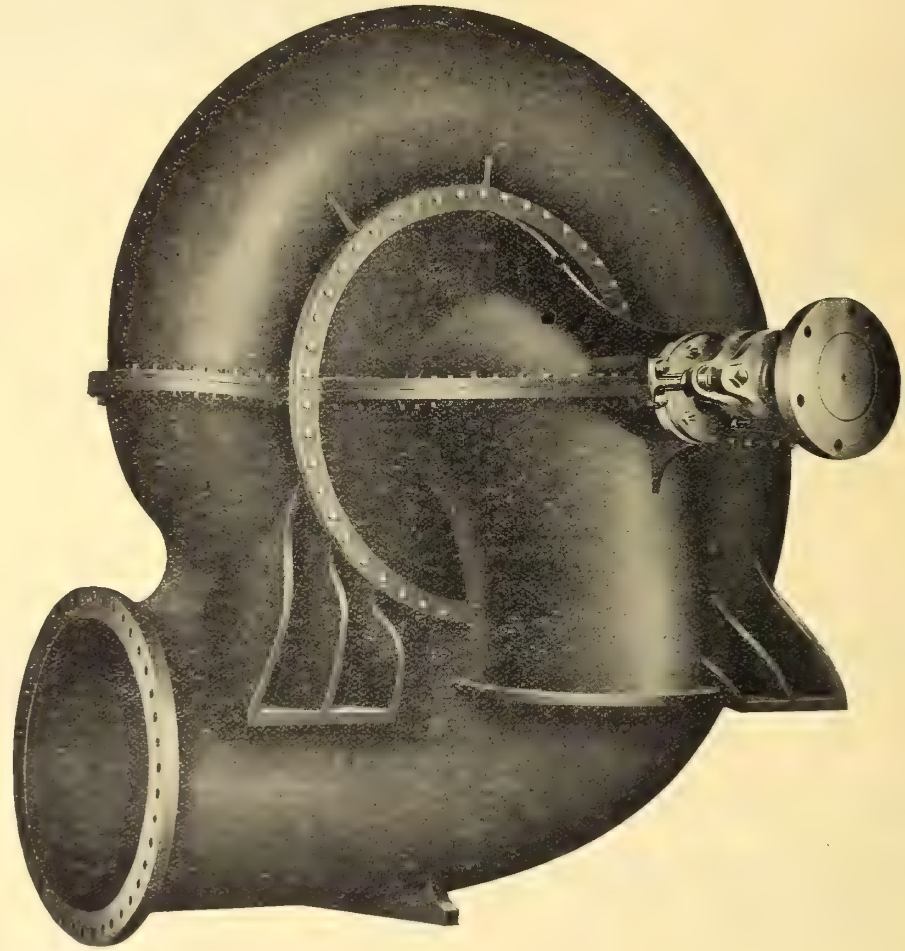
Please Send for Samples and Prices

J. R. Eaton & Sons

Orillia, Ontario

Montreal Agent: THE HARDWOOD FLOORING CO., 55 St. Francois Xavier St.

Centrifugal Pumps



The Pump illustrated above was built by us for the City of Toronto Filtration Plant. It has a capacity of sixty million gallons per twenty-four hours. If interested in this type of pump we will gladly furnish detailed specifications and prices.

The John Inglis Company
ENGINEERS AND BOILERMAKERS Limited
14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Berlin, Ont.
A by-law to extend the sewage system at a cost of about $8,300 will be voted on August 29th.

Carleton Co., Ont.
Tenders are being called for $20,000, 20-year, 5 per cent., good roads debentures.

Calgary, Alta.
By-laws have been passed to issue the following debentures: $284,000 for watermains; $30,000 sewer connections, and $125,000 for building and equipping an addition to the electric power plant.

Dauphin, Man.
Tenders addressed to the secretary-treasurer of this town will be received until September 1st next for labor and material on waterworks and sewerage contracts. For full particulars, see advertisement in this issue. Chipman & Power Toronto and Winnipeg, engineers.

Estevan, Sask.
By-laws to raise $10,000 for cement sidewalks and $8,000 for the extension of sewers were carried.

Esquimalt, B.C.
A committee has been appointed to gather all available data on the installation of a sewerage system. J. Jardine, chairman.

Halifax, N.S.
It is proposed to erect a reservoir for the high pressure service system.

High River, Alta.
Tenders were called until August 9th for construction of about 3,000 square yards of cement sidewalks. G. E. Mack, secretary-treasurer.

London, Ont.
Tenders are being called until August 15th for construction of drain, North Dorchester. Plans, etc., at office of F. W. Farncomb, C.E.

The council decided to purchase a self-registering Venturi meter to cost $1,063 to be installed on the Springbank main to the city.

Manion, Ont.
Tenders will be received until August 17 for Rudsdale Creek improvement and municipal drain. Township of Bathurst. J. H. Moore, C.L.S. & C.E., Smith's Falls.

Moose Jaw, Sask.
The City Council have decided not to award any contract on the basis of tenders received for the sewerage disposal plant City Engineer Wilson was instructed to revise plans and call for tenders to be in by October 17th.

Tenders addressed to W. F. Heal, city clerk, will be received until August 15th for supplying materials for and laying 3,286 lineal feet of 6-inch and 700 lineal feet of 12-inch cast iron watermain. Plans and specifications at office of city engineer, J. M. Wilson.

Outlook, Sask.
Tenders addressed to A. C. Viets, secretary-treasurer, will be received until August 15th for the following works: Contract A, laying water mains, etc.; contract B, constructing power house; contract C, construction of reservoir; contract D, construction of settling tank and intake. J. Darlington Whitmore, Regina, engineer.

Point Grey, B.C.
The four debenture loan by-laws authorizing the borrowing of $500,000 for a water system, $250,000 for sewers, $100,000 for parks and $100,000 for roads, were all carried.

Prince Rupert, B.C.
The report from City Engineer Davis recommends Woodworth lake as a source of supply, and advises that a survey party gauge the flow of water, etc. Mr. Agnew was placed in charge.

Toronto, Ont.
The Board of Control has instructed the city engineer to report on the cost of constructing storm sewers to relieve the present system in time of flood.

Tenders will be received until August 15 for sewers and sidewalk. Barber & Young. York Township engineers.

City Engineer Rust will lay the 500-foot extension to the intake pipe.

Tenders will be received until August 6th for the construction of asphalt pavement and grading of Davenport road and St. Clarence street. G. R. Geary, mayor.

At a meeting of the Board of Works on August 9th City Engineer Rust submitted recommendations for concrete and other sidewalks, water mains, etc., estimated to cost $64,997.

Vancouver, B.C.
The contract for the supply of sewer pipe has been awarded by City Engineer Clement to the Dominion Glazed Cement Pipe Company, Limited, Vancouver, at $70,910. Other tenders were received from Evans, Coleman, Evans, Limited, Vancouver, at $76,930, and C. Gardiner Johnson & Company, Vancouver, at $75,261.

Toronto, Ont.
Tenders will be called for the paving of Westminster road from Prince Edward street to Westmintser avenue. Tenders will be called for the wood block paving of Cambie street from Hastings to Robson.

Winnipeg, Man.
The Provincial Board of Health has advised this municipality to take immediate steps for the establishment of a more adequate water supply.

M. Peterson, secretary, Board of Control, will receive tenders until August 25th for the supply of well drilling machinery capable of boring or drilling holes in the limestone rock from the bottom or top of the city water works wells, which are 15 feet in diameter and from 60 to 100 feet deep. Specifications and forms of tenders on application to City Engineer Ruttan.

AWARDED.

Belleville, Ont.
The tender of the Canada Foundry Company for an electric pump for the waterworks was accepted. It is to be a two and three stage turbine, with capacity of 70,000 gallons per hour, driven by a motor of 115 horsepower.

Harriston, Ont.
The contract for construction of municipal drain, No. 3, Township of Minto, was awarded to D. B. Campbell, Strathroy, at $5,939; Daniel Shea, Egerton, tendered at $5,111, and Crowley & McDonald, Rostock at $6,987.

Hamilton, Ont.
S. Cheeseman was awarded the contract of building a sewer on Wentworth street at $1.15 per foot. The city engineer got the contracts for sewers on Hilliard, Gilkinson and Niagara streets, at $1.65, 99 and 58 cents respectively, but is too busy to undertake the work and he was instructed to sublet the contracts at the same figures, if possible.

London, Ont.
Gartshore-Thompson Company, of Hamilton, were awarded the contract for special castings for the Horton street pumping plant at 4¼ cents a pound.

Moose Jaw, Sask.
The Kettle River Company was awarded the contract for the laying of tracks by the street railway company on that portion of the system route within the paved area.

North Toronto, Ont.
Tenders for the construction of a large number of concrete sidewalks were received and the contract for concrete sidewalks awarded to the Royal Official Stone Paving Company at 44 cents per lineal foot.

Prince Rupert, B.C.
Contract for the supply of lumber for plank roadway was awarded to the Westholme Lumber Company, Limited, Prince Rupert, B.C. $12 per M. feet spruce, f.o.b. wharf, free storage. $16.50 per M. feet fir, f.o.b. scow at wharf, free wharfage, or $18 per M. feet delivered anywhere in city where teams can haul. Other bidders and their prices were as fololws: The Canadian Pacific Sulphite Pulp Company, Limited, Swanson Bay, B.C., $14.95 per M. f.o.b. wharf, spruce. H. A. Sprague, Prince Rupert, B.C., $14.25 per M. spruce, f.o.b. wharf; $17.50 per M. fir, f.o.b. wharf. F. E. Hunt, Prince Rupert, B.C., $16.50 per M. spruce, fo.b. wharf; $20.50 per M. fir, f.o.b. wharf. Wm. T. Robinson, Prince Rupert, B.C., $13.50 per M. spruce. Vancouver Lumber Compnay, Vancouver, B.C., $20.25 per M. fir, f.o.b. wharf. Flewin and Sons, Limited, Port Simpson, B.C., $13.50 per M. spruce, on scow at dock.

Swift Current, Sask.
The contract for tile pipe has been awarded to Blackmer & Post Pipe Company, St. Louis, U.S.A., $10,082.78, and for other pipe to [illegible] & Company, Limited, Montreal, 2-inch, $16.42 per 100 feet; 3-inch, $25.87 per 100 feet; 4-inch,

$38.82 per 100 feet; 6-inch, 63.70 per 100 feet; 8-inch, [illegible] per 100 feet; 10-inch [illegible] per 100 feet. Specials, 15 cents per lb.

St. Boniface, Man.

The following tenders were received for the construction of trunk sewer: A. C Van [illegible], $110,134 (accepted); Kel[illegible] & [illegible], Winnipeg, $131,591; Guilbault & Company, St. Boniface, $144,379.51; M. A. Pigott & Sons, Hamilton, Ont., $125,-[illegible]; [illegible] Paving, Winnipeg, $129,-[illegible]; [illegible] & Kellet, Winnipeg, $110,[illegible]; [illegible] & Son, Winnipeg, $125,465.46. Contract for sidewalks was given to Moen & Sweeney for $12,767.35.

Toronto, Ont.

The tender of the Orpen Company, Limited, of $23.07 a foot, for the construction of section No. 6 of the high level interception sewer, was accepted by the Board of Control. The City Engineer's tender was $23.48. Matthew Warnock was awarded the contract for stop valves for the waterworks, $5,717.52.

Vancouver, B.C.

J. C. Kennedy was awarded the contract for the laying of the Tenth avenue sewer at $48,700. Palmer Bros. & Henning put in a tender for $52,572.

The following tenders for sewer pipe were received: Evans, Coleman & Evans—4-inch, 12 cents; 6-inch, 18¾ cents; 8-inch 27 2-5 cents; 10-inch, 41 cents; 12-inch $1.06; 18-inch, $1.31¾; 20-inch, $1.35½; 60¼ cents; 14-inch, 81 cents; 16-inch, 24-inch, $2.23; total, $76,930.60. Dominion Glazed Cement Pipe Company — 4-inch 12 cents; 6-inch, 17 cents; 8-inch, 25 cents; 10-inch, 39 cents; 12-inch, 50 cents; 14-inch, 75 cents; 16-inch, 95 cents; 18-inch, $1.20; 20-inch, $1.50; 24-inch, $2.25; total $70,910 (accepted). Gardner, Johnson & Company — 4-inch 12 cents; 6-inch, 20¼ cents; 8-inch, 31 cents; 10-inch, 43 cents; 12-inch, 55½ cents; 15-inch, 80 cents; 16-inch, $1.00; 18-inch, $1.41; 20-inch, $1.64; 24-inch, $2.31; total, $75,261.

R. S. Blome & Company were awarded by the Board of Works the contract for the paving of Davie street from Granville to Denman with granitoid paving, at $103,000. M. P. Cotton & Company tendered at $90,000. This tender was not considered as the specifications called for granitoid paving. This contract calls for 25,000 yds of surface. The engineer's estimate was $110,058. M. P. Cotton & Company's was the only tender received for the asphalt paving of First avenue, their figure being $60,000. A representative of the Barber Asphalt Paving Company requested that the time of guarantee be cut down to five years, etc. If this were done his firm would put in a tender which he ventured to say would be inside the engineer's estimate of $50,000. It was finally decided by the board to reduce the guarantee from ten to five years, and also cut down the amount held back when the contract was completed to five per cent. for five years. New tenders will be called for, to be in at the next board meeting.

Winnipeg, Man.

The tender of the National Water Meter Company, of Chicago, for two thousand water meters at $11.75 each was accepted.

Yorkton, Sask.

The contract for the construction of sewers was awarded to N. B. McInnis, of Regina, for the following prices: 2,900 feet of 20-inch sewer complete at $2.35 per foot; 3,200 feet of 15-inch sewer complete at $2.35 per foot; 1,700 feet of 10-inch sewer complete at $1.60 per foot; 2,800 feet of 8-inch sewer, complete at $1.25 per foot. Price for manholes per vertical foot, $6.50.

J. M. Christie, of Yorkton, was awarded the contract for the disposal works exclusive of distributing apparatus and valves at $6,450.

Railroads, Bridges and Wharves

Belleville, Ont.

The Board of Railway Commissioners has approved of the plans submitted by the C. N. R. for its entrance into and passage through Belleville.

Dundalk, Ont.

Tenders will be received until August 15th for the erection of a reinforced concrete bridge over the Saugeen river. I. Traynor, tp. engr.

Galt, Ont.

Tenders addressed to E. O. Fuce, town engineer, will be received until August 11 for construction of two reinforced concrete bridges. Plans, etc., in the office of the engineer.

Quelph, Ont.

The city of Guelph, Ont., are calling for tenders up to August 16th for the construction of a plain concrete arch, span fifteen feet over the raceway at Prescint's Mills. For further particulars see "Tenders and For Sale Department" of this issue.

Hull, Que.

The city engineer in his report condemned the bridges on the Gatineau.

London, Ont.

Engineer Talbot was instructed to prepare the necessary plans and specifications for reinforced bridge on Governor's road The new bridge will have a span of 32 feet, a 16-foot driveway and a four-foot walk.

The county council has called for tenders for a steel and concrete bridge over the Aux Sable river in East Williams. Tenders to be opened on August 27th.

Montmagny, Que.

Tenders will be received until August 20th for wharf extension. R. C. Desrochers, secretary, Dept. of Public Works, Ottawa.

Prince Albert, Sask.

Instructions from headquarters, London England (J. G. F. Greville, managing director) are, to proceed at once with the construction of the Hudson Bay & Pacific Railroad. Chief Engineer Atwood.

St. John, N.B.

Surveys are now being made for the terminals at this port for the Transcontinental Railway, and a corps of engineers of the public works department are busy making soundings in Courtenay Bay, which has been selected as the Atlantic terminus.

Stewart, B.C.

The wharf which was erected at this place by the provincial government has been taken over by the Dominion government who will expend $15,000 upon improvements. Another wharf will be constructed by MacKenzie & Mann in connection with their short line of railway.

St. Eustache, Que.

Tenders addressed to Hector Champagne secretary-treasurer of this village, will be received until August 15th for the construction of an iron bridge over River du Chene, according to plans and specifications prepared by L. A. Vallee.

Toronto, Ont.

Tenders will be received by the Chairman of the Board of Control up to September 6th for the supplying of ties and rails for the construction of industrial tracks. For further particulars see "Tenders and For Sale Department" of this issue.

The sity engineer's draft estimate of the cost of dock at Ashbridge's Bay (600 x 200 x 50), with sheds of corrugated iron construction 500 x 30 x 14 feet, is $130,000. An additional $75,000 would be needed to make a channel available for vessels drawing twenty feet of water, and $5,000 more for derricks. The dock is to be concrete above the water line and a composition of concrete piling and wood sheet piling below water. The docking space would be filled solid and paved. The Board of Control asked for plans and specifications

Vancouver, B.C.

The Board of Works will call for tenders for an overhead bridge across the C. P. R. tracks at Carrall street.

The C. N. R. has made overtures to the government of British Columbia in respect to the securing of aid in the construction of hundreds of miles of branch lines in various parts of the province. In all probability the question will be dealt with at the next session of the legislature early in the spring of 1911.

Wallace, N.S.

Tenders will shortly be called by the Nova Scotia provincial government for the erection of a reinforced steel bridge at Wallace Harbor, N.S. It will be four span of 170 feet.

Winnipeg, Man.

Tenders are being called by the Board of Works until August 10th for painting three bridges over the Assiniboine river. M. Peterson, secretary.

Work has commenced on the Brant street end of the new bridge to span the C.P.R yards. The material for the superstructure is arriving and the William Newman Company will undertake the erection. The material is being supplied by the Cleveland Bridge and Engineering Company, of Darlingford, Eng. The total length of the bridge will be 2,200 feet, the largest span 340 feet. The bridge will carry a double street car track and reinforced concrete sidewalks.

AWARDED.

Brown Hill, Ont.

The contracts for construction of 55-foot steel bridge near here were awarded as follows: Concrete abutments, Jesse Winger, Edgely, $1,628 (others tendered at $2,586 and $1,836); superstructure, J. Vance New Hamburg, $1,093 (others tendered at $1,900, $1,608, $1,500 and $1,514). Bowman & Connor, engineers.

Coaticook, Que.

Contract for 100-foot reinforced concrete arch over the Coaticook river was awarded to Helmer & Winstanley, of Morrisburg, $5,000. Other bidders were W. J. Welch, Coaticook, Que., $5,125; the Laurentian Engineering and Construction Company, Montreal, $6,900.

Digby, N.S.

W. P. McNeil & Company, of New Glasgow, N.S., were awarded the contract for the erection of the Joggins steel bridge at Digby, N.S. It is four span of 118 feet and a draw span of 102 feet.

Edmonton, Alta.

We are informed that the contract for the substructure, high level bridge over North Saskatchewan river has been awarded to John Gunn & Sons, Winnipeg. J. E. Schwitzer, assistant chief engineer, C.P.R.

Natashquan, Que.

The contract for the construction of a wharf here has been awarded to Mr. G. R.

Phillips, of Cornwall, Ont., by the Public Works Dept.

Stewart, B.C.

Gillett & Macdonald, Nelson, B.C., have received the contract for 2,472 feet of approach to the government wharf for $15,000.

Stettler, Alta.

The Northern Construction Company, of Winnipeg, has the contract for building the C. N. R. line from near Stettler, Alta. to the Brazeau coalfields, to connect with the main line at or near Edson.

Vancouver, B.C.

Vice-president Mann, of the C. N. R. has awarded to C. Johnson the contract for grading the last 20 miles of the C.P.R. Other contracts were awarded to McDonald Bros. and W. P. Tierney. It is expected that the etnire 60 miles will be ready for track laying before the end of the year.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

A steam heating plant will be installed at the hospital at a cost of $7,000.

Beamsville, Ont.

Tenders are called until August 12th for the various trades in the erection of two-room addition to school, Section No. 2. Plans, etc., at Mr. F. O. McLean's, this place, or at the office of the architects Munro & Mead, Hamilton.

Bladworth, Sask.

Fraser & Hutchinson, Regina, Sask., are the architects for the four-room school, 34 by 60 feet, to be erected here at an estimated cost of $8,000.

Chatham, N.B.

The Roman Catholics of the North Shore are planning for a large educational institution on the banks of the Miramichi river here.

Dartmouth, N.S.

The school board have selected a site for the new school.

Fortier, Man.

Tenders are being called until August 15th for construction of school here. W. Laurens, secretary-treasurer.

Forest, Ont.

A by-law to issue debentures for $18,000 to build a new public school here, was defeated.

Goderich, Ont.

It is proposed to erect the Huron county sanitorium here.

Halifax, N.S.

The Halifax City Council Committee have under consideration the erection of a new market building to cover a city block.

H. E. Gates, architect, Halifax, N.S., has prepared plans and specifications for a proposed addition to the Halifax Club House; also for a brick building to be used as an addition to the Victoria General Hospital Building.

London, Ont.

Tenders for roofing main building, Western Fair, will be received by the chairman of No. 2 committee until August 11th. Specifications with city engineer. A. E. Nutter, architect.

There is no likelihood of a joint municipal building being erected here.

It is stated that tenders for the new Colborne street school will be called for at once. City Architect Nutter has the plans

Lethbridge, Alta.

The ratepayers passed a by-law to spend $75,000 to build another new school. E. Mack, secretary-treasurer.

Tenders will be received until August 15th for the erection of the Fleetwood School. H. M. & W. A. Whiddington, architects, 211 Sherlock Building.

Ladysmith, B.C.

According to revised plans, the hospital here is estimated to cost not more than $16,000, including plumbing, etc. Tenders are being called. D. Nicholson is interested.

Moncton, N.B.

A new fire hall has been recommended by the Fire and Light Committee.

Moose Jaw, Sask.

Six tenders for the produce market were received, and they ranged from $20,200 to $25,767. For the plumbing and heating of the building two tenders of $2,700 and $2,100 were received.

Montreal, Que.

A recreation hall will be built on to the Catholic church at Verdun, as soon as the present operations in connection with the extension of the church proper are completed.

Mr. A. Content, architect, 17 Place d'Armes Hill, is preparing plans and specifications for the erection of a school building for the Catholic School Commissioner in Rosemount Ward, to be known as the Rosemount School.

Mr. Alphonse Venne is preparing plans for the erection of a church building chapel and presbytery for the Parish of St. Joseph, Ste. Narcisse, Que.

New Glasgow, N.S.

H. E. Gates, architect, Halifax, N.S., has prepared plans and specifications for a public school building here. The structure will be of brick.

Nanaimo, B.C.

Preliminary steps have been taken toward rebuilding the Catholic Church and Convent, destroyed by fire several weeks ago.

Niagara Falls, Ont.

A by-law to raise $15,000 to build an assembly hall and gymnasium for the collegiate institute, together with one to raise two thousand to improve the heating system of the present school building, was voted down by the ratepayers recently. A by-law to raise $2,500 for the erection of a fire hall at the south end carried.

Tenders addressed to R. C. Desrochers secretary, Dept. of Public Works, Ottawa will be received until August 29th for the construction of an armory at Niagara Falls, Ont. Plans, specifications and form of contract can be seen and forms of tender obtained on application to Mr. S. Gott caretaker, Postoffice Building, Niagara Falls, at the office of Mr. Thos. Hastings Clerk of Works, Postal Station F, Yonge street, Toronto, and at the Department.

New Waterford, N.S.

Tenders were called until August 8th for erection of school here. P. W. Cody, P.S. Board, secretary.

Ottawa, Ont.

The sale is noted of the Bethany Presbyterian property on Wellington street stated to be for commercial buildings. The purchaser is D. H. McLean. It is expected that a new church will be erected on Parkdale avenue.

Portage la Prairie, Man.

A by-law has been passed to issue $20,000, 20 year, 5 per cent school debenture

St. Lambert, Que.

The St. Lamberts Council are considering the advisability of constructing an incinerator to more effectively handle the question of garbage disposal.

Swift Current, Sask.

Tenders will be received until August 19 for the purchase of $10,000, 6 per cent. 20 year debentures for school district. W. H Field, secretary-treasurer.

Sudbury, Ont.

Last year $25,000 was voted for a new town hall. The council has now decided that that sum will not erect a suitable building, and a bylaw is to be voted on on August 23rd for an additional $10,000.

Toronto, Ont.

Tenders addressed to A. W. Holmes will be received until August 22nd for the steam heating and plumbing, and electric and acetylene gas illuminating plant, etc. required for St. Augustine's Seminary. Plans, etc., at office of the above, and also at office of A. E. Freeman, consulting engineer, Continental Life Building.

Vancouver, B.C.

Klaw & Erlanger, of New York, are stated to have sent a representative to this city with a view to making preliminary arrangements for the erection of a modern theatre to cost $500,000.

A new club house is to be built at Middlesboro, near here.

Winnipeg, Man.

An up-to-date club house will be erected on Lake Manitoba, near Oak Point. Plans have been prepared by William Bruce, architect, with whom E. E. Wire, Kennedy Buildings, is associated.

The civic library and baths committee have decided to recommend the erection of at least one public plunge and shower bath. $50,000 is available. The intention is to develop a system of public both houses throughout the city. Before work is commenced Controller Waugh's report on bath houses in Chicago will be awaited.

Tenders addressed to E. McKenty, 408 Edmonton street, Winnipeg, will be received until August 15th for all trades in the erection of a brick and stone addition to the Manor Hotel. Plans and specifications at office of Frank R. Evans, 506 Somerset Building.

Welland, Ont.

The Ontario Fireman's Association will apply to the provincial government for a site for a home for aged and disabled firemen.

Webb, Sask.

Tenders addressed to Fraser & Hutchinson, architects, Regina, will be received until August 15th for the erection of a brick veneer school building. Plans and specifications may be obtained on application to the architects, or to the secretary treasurer, E. T. Austin, Webb, Sask.

AWARDED.

Montreal, Que.

La Fabrique de St. Jean de la Croix are erecting a presbytery on St. Lawrence Boulevard. General contract awarded to Boileau Freres, Isle Bizard, Que., contractors. Architect, Z. Trudel, 238 St. Andre street.

Commission Scolaire de St. Jean de la Croix are erecting an educational building on St. Dominique street. General contract awarded to V. Guilbault, contractor. Architect, Z. Trudel, 238 St. Andre street.

Contracts for erection of [illegible] on Mount Royal in connection with the coming Eucharistic Congress have been awarded as follows: Carpentry, [illegible]

Freres; decorative work, Thos. Carley. Estimated cost, $10,000. Mr. Jos. Venne, architect.

Contracts for erection of decorations for Eucharistic Congress have been awarded as follows: O. St. Denis Lettering Company; T. Dansereaux & Company; A. Mon[illegible] & Company. Mr. Alphonse Venne architect.

The contract for wiring Church of the Ascension, Park avenue, has been awarded to the Sayer Electric Company; heating and plumbing awarded to Pratt & Company. Sparrow & McNeil, general contractors. H. C. Stone, architect.

The general contract for erection of the Garneau School for the Catholic School Commissioners has been awarded to Mr O. Rondeau. Messrs. Marchand & Haskell architects.

Quebec, Que.

The following tenders were received for Limoilou fire and police station: Napoleon Gignac, $16,278; Joseph Villeneuve, $16,228; Jobidon & Gravel, $16,477.50; A. Guerard, $15,546 (accepted); Magloire Cauchon, $15,750; Jinchereau & Lamonde, $17,994. Architect, Mr. Tanguay. For the Stadacona station the following tenders were received, the first price being for a building with tower and the second without tower: Jobidon & Gravel, $3,836, $3,436 (accepted); A. Guerard, $5,550, $5,100; C. A. Vezina, $5,439, $4,984; Jos. Villeneuve, $6,080. $6,000; Nap. Gignac, $6,030. Architect Mr. Staveley.

Winnipeg, Man.

J. H. G. Russell has awarded the contract for excavation for the new Westminster church, corner Maryland and Buell streets, to G. H. Vincent. The total cost of the church and school will be about $150,000. Local stone will be used.

Residences

L'Achigan, Que.

In the recent fire the following residences were destroyed by fire: T. H. Forest, $6,000; J. Melancon, $3,500; Mme. Jos. Melancon, $3,000.

Newboro, Ont.

Mr. Wallace, of Galveston, Texas, has purchased Calm Island, where he will erect a $30,000 cottage on it.

Victoria, B.C.

G. Gillespie, manager of the Bank of Commerce, will erect a summer residence at Sooke. H. J. Rous Cullin, architect, has prepared plans and tenders have been called.

Vancouver, B.C.

Recent building permits include: A Matheson, 3016 St. Catherine street, two houses, $3,200; R. Hudson, 1924 Bismarck street, $2,500; Vancouver School Board brick school, Templeton Drive, $26,900; Vancouver School Board, Clark Drive brick addition, $50,000; Leonard Wett brick store building, 895 Granville, $5,000; Alex. Munro & Sons, four frame dwellings 2528 Woodland drive, $10,000; A. Chisholm frame stable, 769 Fourteenth east, $4,000; J. Elliott, 320 Jackson avenue, $5,000; J. Hardig, 3373 Second avenue, $3,000; G. Adams, Hastings street, $2,500; J. R. Reid Twelfth avenue west, $4,000; M. Parsons 1447 Semlin drive, $3,500; J. B. Arthur 1315 Eleventh avenue west, $3,500.

AWARDED.

Montreal, Que.

Mr. J. B. Julien is erecting three dwellings and two stores on Church street. Contract awarded to D. Vallancourt, contractor, 197 First avenue; architect, C. Dufort La Patrie Building.

Business Buildings and Industrial Plants

Berlin, Ont.

A by-law to authorize the loan to Daetz Bros. & Company in return for which they will erect a four-storey building, 125 x 60 feet, will be voted on.

Brandon, Man.

The Empire Hotel was destroyed by fire on the 28th ulto. Estimated loss, $30,000.

Cochrane, Ont.

Fire destroyed nineteen buildings here last week at a loss of $150,000. Among the losers were Rothschild Bros., Chamandy Bros., and J. Pelangil.

Esquimalt, B.C.

The British Columbia Marine Railway Company is notifying the Ottawa Government that they will submit a tender for the construction of a Canadian cruiser of the British type at Esquimalt. This would mean the installation of a modern plant costing thousands of dollars.

Fort William, Ont.

The Canadian Bank of Commerce will erect a branch building here.

Fort Frances, Ont.

Final arrangements for pulp and paper mills to be erected here have been concluded by Mr. T. Preston, it is stated. The capital is guaranteed by Peabody, Houteling & Company, Chicago, U. S.

Hamilton, Ont.

The Bank of Nova Scotia has purchased a site on King tsreet east for the erection of a new bank building.

L'Achigan, Que.

The Bank of Hochelaga was destroyed by fire on the 1st inst. Loss estimated at $3,000.

MacLeod, Alta.

The C. P. R. dining hall was destroyed by fire with a loss of $12,000.

Moose Jaw, Sask.

The departmental store of W. Robinson Company was damaged by fire on the 1st inst. to the extent of about $75,000.

Montreal, Que.

Tenders are now being received for the installation of plumbing and heating and elevator supplies in the New Yorkeshire Insurance Building. Saxe & Archibald, architects.

Damage to the extent of $10,000 was caused by fire recently to the premises at 869 Mount Royal avenue.

The Herald Printing Company has leased premises at the corner of St. David and St. Antoine streets and will shortly erect a one-storey office and printing building.

The officials of the Montreal Island and Terminal Railway Company have been asked to erect a station and waiting room at the corner of La Salle avenue and Notre Dame street.

Ottawa, Ont.

Messrs. Blackburn & Bryson have decided to erect a 3-storey building instead of two storeys, along Bank street, between Sparks and Wellington. The building will be 120 feet long by 50 feet deep. C. P Meredith is architect.

The Russel Shale Brick Company has been organized with a capital of $300,000 and was granted a charter by last week's Canada Gazette. It will erect a large plant at Russell where it has property containing large quantities of shale. The plant will be ready for operation next spring.

The Dominion Explosives, Limited whose plant at Arnprior was wrecked by a recent explosion will rebuild. They have secured the necessary permission from the local municipal council.

Port Moody, B.C.

The B. C. Oil Refinery's plant was destroyed by fire last week at a loss of $100,000.

Port Arthur, Ont.

J. H. Ashdown, of Winnipeg, has been here looking over various sites with a view to establishing a distributing warehouse.

Qu'Appelle, Sask.

The flour mills here were destroyed by fire on the 15th inst. at an estimated loss of $20,000. The Imperial Bank is interested.

Quebec, Que.

The tenders for the new ferry buildings being too high, new tenders will be called to include both building and gate.

St. Catharines, Ont.

It is reported that Messrs. McSloy will shortly announce their plans of enlargement.

A by-law to give the Canada Haircloth Company certain privileges in return for which they will extend their present plant, will be submitted to the ratepayers on August 29th.

Selkirk, Man.

The cold storage plant of the Winnipeg Fish Company was destroyed by fire on the 2nd inst. Total estimated loss, $60,000.

Saskatoon, Sask.

The Winnipeg Oil Company's warehouse was destroyed by fire on the 29th ulto. Estimated loss, $10,000.

Tenders for erection of brick warehouse for the Cockshutt Plow Company, were called until August 6th. S. F. Peters, architect, 392 Main street, Winnipeg.

Seaforth, Ont.

The ratepayers have approved a by-law to guarantee the bonds of the Bell Engine & Thresher Company for $50,000 for 30 years.

St. Lambert, Que.

Tenders are now being received for the construction of a printing office in Brooklyn Park for Mr. Emmerson G. Hart. Mr. Philip J. Turner, F.N.I.B.A., architect.

St. Jacques-L'Achigan, Que.

Twelve buildings were destroyed recently by fire at a loss of $75,000. The principal losers were the Bank of Hochelaga M. Granger, T. H. Forest and J. Melancon

Toronto, Ont.

The Don Foundry Company's property at Ashbridge's Marsh was destroyed by fire last week at a loss of $6,000.

The Nasmith Company, Limited, will erect a two-storey factory on the north side of Duchess street, near Sherbourne at a cost of $60,000.

Hobberlin Bros., clothiers, will erect a new building at the southeast corner of Yonge and Richmond streets.

Vancouver, B.C.

Architect W. T. Whiteway has prepared plans for a modern business structure to be erected on Pender and Beattie streets by World Building, Limited, Vancouver The construction will be of class A steel frame; reinforced concrete floors; materials, stone, brick and terra cotta. There will be eight storeys and basement to the main building and a tower ten storeys in height. Estimated cost of building, $275,000.

The National Apple Show are about to take tenders for an addition to Machinery Hall, where their exhibitions are held.

The B. C. E. R. Company has decided to build a magnificent depot building at a cost of $250,000.

Victoria, B.C.

Mr. A. E. Todd will have a brick business block built on the southeast corner of Fort and Cook streets, to cost about $20,000. G. C. Mesher & Company, architects.

MacKenzie & Mann have secured an option on the entire holdings, placed at a mililon dollars or more, of the Pacific Whaling Company, on this coast. The capital will probably be raised in London. The extension of the operations will mean new industries, glue factories and oil refineries for lubricants, as well as illuminating oils.

West Toronto, Ont.

It is reported that the Molsons Bank intend erecting a bank building on the north side of Dundas street.

Woodstock, Ont.

Negotiations are in progress between this city and a company to be known as the Woodstock Textile Company. In return for privileges a factory will be established, in which, it is stated, $18,000 worth of machinery will be installed. Mr. Holden, of Franklin, Pa., U.S.A., will be in charge; Ald. A. B. Welford, this city, is interested.

Winnipeg, Man.

The following tendered for construction of Bakery Building: Wallace & Akins, $37,500; Wm. Garson, $37,800; John McQuarrin, $38,600; Johnson & Tusin, $38,200; Clayton Bros., $37,650; W. J. Davidson, $39,000. Contractors, Shepley Construction Company, J. Woodman, architect. Amount of permit, $70,000.

The C. N. R. will build a depot on the Oak Point branch near Portage avenue. The C. P. R. will also erect a depot on the Gretna branch in St. James, near the avenue.

The C N. R. have a permit to construct coach shops in the west yard, $42,000. The contract has been let to the Carter-Halls-Aldinger Company.

It is reported that the firm of Wortman & Ward, whose large factory at London was recently burned out, have bought a tract of land in the western part of Winnipeg and will build a large factory in the fall.

AWARDED.

Brantford, Ont.

Contracts have been awarded as follows for the construction of the Verity Plow Company's buildings: Warehouse, 200 by 60 feet, three storeys and basement, Richards & Pringle; blacksmith shop, 200 by 60 feet, one storey, with slate lantern roof, Eli Riddolls; paint shop, 100 by 58 feet, one storey, Eli Riddolls; core room, 50 by 60 feet, one storey, Richards & Pringle. The buildings will all be of brick. Total cost with necessary machinery, will involve an expenditure of $60,000.

Campbellton, N.B.

B. Mooney & Sons have obtained the contract for the mason work required in the erection of a brick bank building with cust stone front to be erected according to plans prepared by F. Neil Brodie, architect.

Galt, Ont.

Shurley & Dietrich Company have let the contract to Sibley & Miller for a two-storey brick warehouse, 80 x 44 feet.

Montreal, Que.

The general contract for the erection of the extensive shops of the Montreal Street Railway Company has been awarded to J. B. Pauze & Company. Marchand & Haskall, architects.

Mr. Walter Livermore, building superintendent, 72 Anderson street, has awarded the following contracts for the alterations and additions to St. Georges' Home Lagauchetiere and Mansfield streets: Masonry and brick, A. E. Wand; carpentry, A. Heaton; plastering, H. Oram; plumbing and heating, W. Ware & Son; painting and glazing, E. T. Houghton.

The contract for supplying glazed terra cotta "Carrara," manufactured by Doulton & Company, Limited, London, for the new building to be erected in Montreal by the Dominion Express, has been awarded to W. Beverley Robinson, their Canadian agent. This is stated to be the largest job in glazed terra cotta in Canada.

Ottawa, Ont.

M. M. O'Connell has secured the plumbing contract for the stores of Dr. J. E. Taggart on the corner of Rideau and Little Sussex. Weeks & Keefer, architects.

F. J. Jagon & Company, Montreal, has been awarded the sub-contract for concrete work on the Rosenthal Building Sparks street, by C. E. Deakin, general contractors.

St. Catharines, Ont.

Messrs. Newman Bros. have been awarded the contract for the erection of a large new building for the McKinnon Dash & Metal Company. The new building will be 300 by 80 feet.

Power Plants, Electricity and Telephones

Blyth, Ont.

The contracts for erection of municipal telephone system have not been let. A. Elder, secretary.

Calgary, Alta.

"See "Waterworks."

London, Ont.

Tenders for erection of transformer substation will be received until August 10th. Plans, etc., at office of City Engineer. A. E. Nutter, architect; P. Pocock, acting chairman, Water Commission.

Moose Jaw, Sask.

The Moose Jaw Electric Railway Company, made up of Ottawa capitalists, has passed a preliminary order with the Lorraine Steel Company for 110 tons of steel rails. John B. McRae is consulting engineer. A. Dion, Ottawa, is president of the company. The line will be about six miles long.

Moose Jaw, Sask.

See "Waterworks Awarded."

Nanaimo, B.C.

A by-law in regard to the proposition of the Dominion Stock and Bond Corporation to construct an electric railroad of twenty miles, will be submitted to the ratepayers shortly. G. H. Salmon, manager. Noted in issue of July 20th.

Ottawa, Ont.

Among the building permits taken out during the past week were: Wm. Fields, Sweetland avenue, dwelling, $2,500; A. D. Porter, Somerset street, addition and alteration to dwelling, C. P. Meredith, architect, $8,500; W. A. and W. J. Lamb, Queen street, warehouse, C. P. Meredith, architect, T. James, builder, $9,000; B. P. Dewar, Wilbrod street, dwelling, Horwood Taylor & Horwood, architects, F. McCullough, builder, $3,000; W. A. Currie, Delaware avenue, W. J. Avery, architect, F. Currie, builder, dwelling, $4,500.

It is intimated by President D. D. Mann of the C. N. R., that construction work will shortly be commenced on the Lake Superior division of this company's line.

Point Grey, B.C.

The by-law granting the street railway franchise to the B.C.E.R. Company was carried by a small majority.

Seaforth, Ont.

Two by-laws for hydro-electric power were approved by the ratepayers on August 8th.

Toronto, Ont.

See "Public Buildings."

Victoria, B.C.

The city will purchase from the Canadian General Electric Company 60 arc lamps and a new armature and have a generator rewound for the operation of such lamps for the sum of $3,400.

Vancouver, B.C.

See "Business Buildings."

AWARDED.

Belleville, Ont.

The Canada Bridge Company have begun work on a new bridge to be erected by the county of Hastings and the city of Belleville over the Moira river on the boundary line. The contract price is $10,500.

Calgary, Alta.

The contract for 26 miles of track for the C. P. R. between Carmangay and Aldersyde, has been awarded to Foley, Welch & Stewart, of Winnipeg. Work will be started at once.

Cornwall, Ont.

The general contract for the erection of a residence for the manager of the Bank of Montreal, has been awarded to G. W. Lester. Messrs. Peden & McLaren, architects, Montreal.

Ladysmith, B.C.

The Hinton Electric Company, Limited of Victoria, has received the contract for the supply of all electrical materials in connection with the installation of the new Tungsten street lighting system here.

Lachine, Que.

The Bishop Construction Company, Limited, have been awarded the contract for 60,000 tons of crushed and dimensioned stone for the C. P. R. St. Lawrence river bridge at Lachine.

Montreal, Que.

The contract for excavation and masonry work, residence at Montreal West, for Mr. J. Stevenson, has been awarded to J. J. Kirkpatrick. Messrs. Peden & McLaren architects.

The following contracts for alterations to a residence on Forden avenue, Westmount, for Mr. John Ogilvy, have been awarded: Excavation and masonry, Alex. M. Ross; carpentering work, E. T. Scott; painting, R. E. Doane; plastering, Watson & Wilson. Mr. Robt. Findlay, architect.

Sub-contract for the roofing of two residences for Mrs. Clelland and Cambell, has been awarded to Sibley & Hout, roofers Duke street. General contractors, [illegible]. Architects, MacVicar & Heriot, 104 Union avenue.

Sub-contract for the roofing of eight

(Continued on page 29)

Tenders and For Sale Department

Tenders for Bridges

Tenders will be received by the undersigned until SATURDAY 13TH OF AUGUST, for the [illegible] work for two Steel Bridges to be erected in the Township of Burford. Plans and specifications may be seen at any time at my office, New Durham, Ont.

PHILIP KELLY,
Township Clerk,
New Durham, Que.

City of Moose Jaw
Saskatchewan

Sealed tenders will be received by the undersigned City Clerk until 8.30 o'clock p.m. on MONDAY, AUGUST 15TH, 1910.

Supplying materials for and laying 3286 lineal feet of 6-inch and 700 lineal feet of 12-inch Cast Iron Water Main.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw, and also at the office of the Canadian Engineer, Winnipeg.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, Sask., July 16th, 1910. 32

City of Moose Jaw
Saskatchewan

Sealed tenders will be received by the undersigned City Clerk until 8.30 o'clock p.m. on MONDAY, AUGUST 15TH, 1910.

Supply materials for and constructing approximately:

63,000 square feet of Concrete Walks.
9,000 lineal feet of combined Curb and Gutter.
6,000 square feet of Concrete Crossings.
6 miles of Wooden Walks.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, Sask., July 28th, 1910. 32

Town of Estevan
Province of Saskatchewan

Electric Lighting and Sewerage

Sealed tenders will be received by the Secretary-Treasurer until 8 p.m. on WEDNESDAY, AUGUST 24TH, 1910, for the following works:

Contract "A"—Pipe-laying on Storm Sewers.
Contract "B"—Power House.
Contract "H"—Two Return Tubular Boilers.
Contract "J"—High Speed Steam Engine.
Contract "K"—Electric Lighting System.
Contract "S"—Sewer Pipe.

Plans and specifications may be seen at the office of the engineers, Winnipeg, and Toronto, and at the Town Hall, Estevan.

J. G. HASTINGS, ESQ., Mayor, Estevan, Sask.
L. A. DUNCAN, ESQ., Secretary-treasurer, Estevan, Sask.

CHIPMAN & POWER, Engineers,
Winnipeg and Toronto.

30

Tenders

Toronto General Hospital
College Street

Tenders addressed to the Chairman of the Building Committee will be received by the undersigned up till noon

Monday, August 15th, 1910

for all the various trades required in the erection and completion of buildings for the Out-Patient Department and the Emergency Hospital in connection with the General Hospital.

Plans and specifications and all other information may be obtained at the office of the architects.

The lowest or any other tender not necessarily accepted.

DARLING & PEARSON,
32 2 Leader Lane, Toronto.
accepted. 32

Tenders

Tenders will be received by the City Clerk up to 5 p.m., TUESDAY, AUGUST 16TH, 1910, for the construction of a plain Concrete Arch, span fifteen feet, over the raceway at Presant's Mill, Huskisson Street, Guelph, Ont.

Plans and specifications may be seen and forms of tender obtained at the office of the City Engineer.

A marked cheque for $40.00 must accompany each tender.

The lowest or any tender not necessarily accepted.

L. MALCOLM,
32. Acting City Engineer.

Town of Oshawa

Tenders are called for the construction of 4,000 lineal feet of First Class Heavy Macadam Pavement, 43 feet wide, on King Street and Simcoe Street, and 2,500 feet of Light Macadam, 32 feet wide, on Simcoe Street.

These will be received up till noon of the 18TH DAY OF AUGUST, 1910, at the office of the Town Engineer of Oshawa.

Specifications and forms of tender will be sent on application, and all applications must be made on the forms provided.

Plans and specifications may be seen at the office of the Town Engineer. The lowest or any tender not necessarily accepted.

FRANK CHAPPEL,
32 Town Engineer.

Steel Viaduct
on Queen Street East

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon, on TUESDAY, SEPTEMBER 6TH, 1910, for the construction of a steel viaduct on Queen street in the City of Toronto, crossing over the River Don, and the roadways on each side, and over the tracks of the Canadian Pacific, Canadian Northern ,and Grand Trunk Railways, including the following approximate quantities:

Excavation (ordinary)—5,400 yards.
Excavation (trenches)—2,300 yards.
Filling—24,000 yards.
Concrete reinforced walls and footings—1,570 yards.
Concrete reinforced floor slab—880 yards.
Piling concrete—10,400 lineal feet.
Steel reinforcing rods—113 tons.
Reinforcing fabric—20,000 square feet.
Structural Steel—752 tons.
Paving (wood block)—3,010 square yards.
Paving (macadam)—9,000 square yards.
Also Railing, Waterproofing, etc.

Plans and specifications may be seen, and forms of tender obtained at the office of Bridge Department, City Hall, Toronto, or may be seen at office of "Contract Record," B34, Board of Trade Building, Montreal, Que.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer) not members of the City Council, or officers of the Corporation of the City of Toronto, or in lieu of said sureties, the bond of a guarantee company approved of, as aforesaid.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, July 22nd, 1910. 32

Town of Dauphin
Province of Manitoba

Water Works and Sewerage Notice to Contractors

Sealed tenders will be received by the Secretary-Treasurer until 8 p.m. on THURSDAY, SEPTEMBER 1ST, 1910, for the following:

Contract "A"—Labor, laying about six miles of water pipes and sewers; sub-divided into two sections.

Contract "D"—Furnishing cast iron water pipe and speical castings.

Contract "E"—Furnishing gate valves for fire hydrants, etc.

Contract "M"—Labor and materials for ten miles of gravity main; sub-divided into three sections.

Contract "R"—Constructing concrete reservoir.

Contract "S"—Furnishing sewer pipes.

Contract "W"—Furnishing wooden stave pipe.

Plans, specifications, etc., may be seen at the Town Hall, Dauphin, or at Engineer's offices, Winnipeg and Toronto.

No tender necessarily accepted.

R. C. SPARLING, Esq., Mayor.
J. A. CAMPBELL, ESQ., Chairman.
J. W. JOHNSTON, Esq., Secretary-Treasurer.
CHIPMAN & POWER, Engineers.

34

Tenders Wanted

Sealed tenders, marked "Tenders for Bridge," will be received by the undersigned for the erection of a

Reinforced Concrete Bridge

over the Saugeen River on the concession line between lots 57, concession 2 and 3, east of the Garafraxa Road in the Township of Glenelg, in the County of Grey.

Tenders will be received for work complete.

Plans and specifications may be seen at the office of I. Traynor, Township Engineer, in Dundalk, or at the residence of the undersigned, lot 50, concession 3, east of Garafraxa Road, Glenelg, on and after Friday, August 5th, 1910.

Lowest or any tender not necessarily accepted.

Tenders opened at the Middaugh House, Durham, on MONDAY, AUGUST 15TH, 1910.

WM. WEIR,
Deputy Reeve of Glenelg,
32 Durham P. O.

Tenders
for
Electric Lighting

Sealed tenders addressed to the undersigned and marked "Tenders for Electric Lighting" will be received at the office of the City Clerk, Charlottetown, Prince Edward Island, until 12 o'clock noon on SATURDAY, THE 10TH DAY OF SEPTEMBER, 1910, for supplying the City of Charlottetown with Electric Light for Street and Commercial purposes. Tenders to state price and illuminating capacity per lamp for street light, and rate per kilowatt hour for commercial lighting.

The lowest or any tender not necessarily accepted.

Further information can be obtained by applying to

W. W. CLARKE,
City Clerk.
Charlottetown, P.E.I., July 20th, 1910. 34

Tenders for Additions and Alterations to the High Level Pumping Station

Bulk tenders, or tenders for the several trades mentioned below, in connection with the above building, will be received by registered post only addressed to the undersigned up to noon on TUESDAY, THE 16TH AUGUST, 1910,

1. **Mason Work.**
2. **Carpenter.**
3. **Roofing.**
4. **Painting.**

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The usual conditions relating to tendering, as prescribed by city by-laws, must be strictly complied with, or tenders may not be entertained.

Tenderers will submit with their tender the names of two personal sureties, or the bond of a guarantee company.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor),
Chairman, Board of Control.
City Hall, Toronto, August, 1910. 32

Tenders for
Ties and Rails
for Construction of Industrial Tracks on East Bank of the Don

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, SEPTEMBER 6TH, 1910, for the following materials: 20,800 feet of partly worn or re-laying rail; 400 oak ties and 4,800 cedar ties.

Envelopes containing tenders must be plainly marked o ntheotieudsETAOIN SHRDLUU CMFI marked on the outside as to contents.

Specifications may be seen at the office of the City Engineer, Toronto.

The tenderers shall submit with their tender the names of two personal sureties (approved by the City Treasurer), not members of the City Council or officers of the Corporation of the City of Toronto, or, in lieu of said sureties, the bond of a Guarantee Company approved of as aforesaid.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.
City Hall, Toronto, August 6th, 1910. 33

St. Augustine's Seminary

Tenders will be received by the undersigned until 12 o'clock noon on MONDAY, THE 22ND INST. for the Steam Heating and Plumbing, and Electric and Aceteline Gas Illuminating Plant, etc., required for St. Augustine's Seminary, on the south side of the Kingston road, near Toronto.

Plans and specifications may be seen at the office of the architect, and also at the office of A. E. Freeman, consulting engineer, Continental Life Building, Toronto.

Each tender must be accompanied by a marked cheque equal to five per cent. of the amount of tender, and security to the extent of one-third of the amount of contract will be required for the faithful performance of the contract.

The lowest or any tender not necessarily accepted.

ARTHUR W. HOLMES,
Architect,
32 10 Bloor Street East, Toronto.

Tenders
for
Sewers and Sidewalks
Township of York

Sealed tenders plainly marked on the outside as to contents will be received by the undersigned up to twelve o'clock noon of MONDAY, AUGUST 15TH, 1910, for the construction of the following works in the Township of York:

982 feet Vitrified Pipe Sewer on Spadina Road northerly from the city limits;

592 feet Vitrified Pipe Sewer on Walmer Road northerly from city limits;

[illegible] feet Granolithic sidewalk on Markham Street, northerly from the city limits.

Separate tenders will be required for the works named, but bidders may tender on any one or all of the three.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, [illegible] Adelaide Street East, Toronto.

The lowest or any tender will not necessarily be accepted.

BARBER & YOUNG,
[illegible] York Township Engineers.

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 inch x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

COMPLETE ARCHITECTURAL DRAWING COURSE, including drawing outfit and text-books, International Correspondence School, fully paid up, for sale at sacrifice.—Box 123, CONTRACT RECORD, Toronto, Ont. 32

CONTRACTOR'S OUTFIT FOR SALE—Six Wheeler, No. 3, concrete line plant, nearly new. Owner going into another line of business. Joseph Patterson, Box 114, St. Marys, Ontario. 35

Power Plants, Electricity and Telephones

(Continued from page 27)

houses on Clarke and Montrose avenues for Preble McIntosh, Esq., has been awarded to Sibley & Hout, Duke street. General contractors, D. G. Loomis & Sons, Cote St. Paul.

Messrs. Hogle & Davis, architects, 80 St. Francois Xavier street, have awarded the general contract for the erection of a residence on Park avenue for Dr. W. J. Patterson, to Geo. W. Goodbody, contractor 2300 Waverley street.

Further contracts have been awarded by the Canadian Light & Power Company as follows: Messrs. Babcock & Wilcox, boiler equipment for terminal station at Cote St Paul; Allis-Chalmers-Bullock, Limited, steam turbine equipment, consisting of 1,875 k.v.a.; John Inglis Company, contract for steel intake gates for entrance to Beauharnois Canal.

Ottawa, Ont.

The contract for the substructure of the bridge over the Saskatchewan river at the Pas Mission has been let to MacKenzie & Mann, the contract figure being $100,000. The contract for the superstructure of this bridge, which will constitute the first link of the Hudson Bay Railway, was let some weeks ago to the Canada Foundry Company.

C. J. Burritt, architect, has charge of alterations in the residence of Mr. D'Arcy Scott, on Chapel street. Alex. Christie has the carpentering contract; F. McCullough, the masonry; John Sutherland, the plastering.

David Findley is building a fine stone residence at Carleton Place, which will cost about $20,000. C. J. Burritt is the architect. Alex. Christie, of Ottawa, has the contract for the carpentering; Patrick McGregor, of Carleton Place, the masonry; the Modern Machine Company, of Ottawa the galvanized iron work. The other contracts have not been awarded

Miscellaneous

Calgary, Alta.

The Ambursen Hydraulic Company are submitting to the C. P. R. plans and estimates for the construction of a large irrigation dam at Horseshoe Bend, to cost over half a million dollars.

Hamilton, Ont.

Recent building permits include: Stuart & Witton, alterations to hotel building, [illegible] street, for John Sloan, [illegible] cost $1,000; Stewart & Witton, alterations to store building, corner King and Hughson streets, for Thos. C. Watkins, $7,000; Wm. Baxter, two brick dwellings, Markland, corner Hess street, to cost $5,000.

Moncton, N.B.

The city council have decided to expend more than $12,000 upon increased fire protection. A new fire station will be erected and thirty new hydrants installed. The purchase of a chemical engine is under consideration.

Montreal, Que.

Recent building permits include: A. Boyer, 33 Boucher, house containing four dwellings, $3,000; R. R. Grises, Guy street, residence, $2,500; J. Gibbs, 19 Vaillant, house containing two dwellings, $4,500; J. Parisian, 890 St. Hubert, residence, $2,500; Leblanc & Latour, 1171 Bordeaux, two houses containing four dwellings, $8,000; C. Bellehurveau, 566 Visitation street, three houses, $4,500; O. St. Denis, 2,229 St. Hubert, house containing three dwellings, $2,500; Com. Scolaire de St. Jean de lo Croix, St. Zotique & St .Laurent, church biulding, $50,000; Messrs. St. Denis, 1 St. Germain, house containing two dwellings $6,000; N. Desjardins, St. Lawrence, two house scontaining six dwellings, $4,000; W. Lajaunesse & Company, 476 Berri, four houses containing twelve dwellings, $10,000; Lo Fabrique de St. Jean de la Croix, St. Lawrence Boulevard, residence, $10,000; G. Guilmette, 750 St. Denis street, two houses, containing six dwellings, $3,500; A. Mongeau, 1242 Bordeaux, two houses containing eight dwellings, $5,000; Mrs. D. Kylee, 1742 Hutchison, two houses, containing six dwellings, ,$4500; Mrs. M. Martin, 929 Logan, house containing three dwellings, $3,000; H. Gousset, 2609 Labelle, three houses containing six dwellings, $3,600, Mrs. J. D. Viger, L'Assomption avenue, store, $4,000; P. Casey, 791 St. Denis, five houses containing fifteen dwellings, $12,500; Desmond Flint Glass Company, 179 Delorimiere avenue, warehouse, $20,000, house $4,000; R. Rabecca 65 Notre Dame east, house containing three dwellings, $3,000; Dr. W. J. Patterson, Edward Charles and Park avenue residence, $6,000; L. O. Grothe, Cartierville avenue, alterations to warehouse, $7,000; The Talmud Farah of Montreal, 106 Dorchester east, alterations to two houses $5,000; City Central Real Estate Company alterations to hotel, $125,000; St. George Society, 495 Lagauchetiere street, alterations to dwelling, $2,500.

Ottawa, Ont.

Preliminary reports received at the public works department here indicate that surveying parties along the Saskatchewan river, for which a party was sent out some time ago, is going ahead and by the time parliament assembles there will be available preliminary estimates of the cost of the proposed waterway for grain from Edmonton to Winnipeg. While not officially stated, it is roughly estimated that the work necessary to navigation along the Saskatchewan can be done for about $15,000,000. This is exclusive of the construction of locks to overcome the Grand Falls. In some places the river is six feet in depth, and in others forty feet. It will require much dredging. It seems to be a sure thing that the waterway will be built and if the estimates are received in time to remove any doubts as to its feasibility a preliminary appropriation is expected next session.

Smiths Falls, Ont.

Tenders addressed to R. M. Anderson, clerk of Bathurst Township, Manion P. O. will be reecived until August 17th for Rudsdale Creek improvement. Plans, etc. at office of above or at office of J. H. Moore, C. E.

Toronto, Ont.

Recent building permits include: J. H. Shales, pair semi-detached 2½-sty. brick dwellings, 22-24 Dearbourne, $5,000; E. A. Kantel, 1-sty. brick warehouse, 189 Church street, $6,000; A. A. Wright, 2½-sty, brick and stone dwelling, Warren road, $16,000; W. J. O'Reilly, 8 attached 2½-sty. brick and stone dwellings, Dundas street, $24,000; Bathurst Street Methodist Church, 2-sty. brick Sunday school, corner Bathurst and Lennox, $30,000; A. B. Coleman, 3-sty. brick and stone apartment, $8,000; Harris Abattoir, 3-sty. steel and wood store and cold storage building, St. Lawrence Market, $7,000; Frank Britton, pair 2-sty. brick dwellings, Greenwood avenue, $7,000; Weismiller & MacKenzie Bros., pair semi-detached 2-sty. brick dwellings, Pearson avenue, $5,000; Wm. Hodgkinson, 3 attached 2½-sty. roughcast dwellings, brick fronts, Leslie street, $5,500; Wm. Hodgkinson, 3 attached 2½-sty. roughcast dwellings, brick fronts, Curzon street, 5,500; J. A. Simmers, 4-sty. brick office and warehouse, King street east, $11,000; Danforth Avenue Methodist Church, 2-sty. brick church, corner Danforth and Jackman $12,000; Free Masons' Hall, 2-sty. brick and stone hall, College street, $25,000; J Bodie, pair semi-detached 2½-sty. brick dwellings, Pape avenue, $6,000; Wm. Rankin, 3 attached 3-sty. brick and stone stores and dwellings, Dundas, $10,000; R. J. Beamish, 2½-sty. brick and stone dwelling, Roxborough street east, $6,000; Love Bros., 2 detached 2½-sty. brick and concrete dwellings, 9 and 24 Fairview avenue $5,000; Wm. Pendleton, 2 pair 2-sty. roughcast dwellings, brick fronts, Greenwood avenue, $6,000; A. E. Osler, 2½-sty. brick and stone dwelling, Summerhill Gardens $6,000; H. H. Williams, 2-sty. brick office 36 King street east, $5,000; H. Blake, 2-sty. brick and stone addition to dwelling, Clarendon avenue, $25,000; Shurly & Derritt, 2-sty. brick addition to factory, on Bartlett avenue, $5,200; W. J. Dempster 3 attached 2-sty. brick dwellings, Perth avenue, $6,000; A. Duff, 2 pair semi-detached 2-sty. brick dwellings, Columbus, $6,000; R. C. Vaughan (in trust), 2½-sty. brick dwelling, near Rowanwood avenue on Cluny, $5,500; Separate School Board, 2-sty. brick addition to school, near Bloor, Bathurst, $9,000; Briggs & Beecroft, 2 detached 2-sty. and attic brick dwelling, near Empress, Jameson, $5,800; Board of Education, 1-sty. brick addition to school, near Lowther, Huron, $8,000; Thos. West, 4-sty. brick factory, near Frederick, Front street east, $15,000; E. A. Lowe, 3 attached 2-sty. brick dwellings, Symington, $7,500; E. B. MacKenzie, 2½-sty. brick dwelling near St. Clair, Foxbar road, $5,000; Mrs. Grafton, 2 pair semi-detached 2-sty. brick dwellings, near Bowden, Dearbourne, $8,000; S. Pearcy, 3 attached 3-sty. brick stores and dwellings, corner Moscow and Danforth, $5,500; Miss Gertrude Abner pair 2-sty. brick dwellings, 43-45 Endean avenue, $5,500; T. P. Stewart, 2½-sty. brick dwelling, near St. Clair, Dunvegan, $10,000; Bailey & Leslie, 4 detached 2-sty. and attic brick dwellings, near Edna, Barrett, $14,000; D. B. Bowerman, 2-sty. and attic brick dwelling, 4 Whitney avenue $9,000; Standard Sanitary Manufacturing Company, 1-sty. brick power house, Royce and Lansdowne, $10,000; Mrs. J. A. McGillvray, 2-sty. brick dwelling, near Glen road, Whitney, $10,000; Alex. Lochare, 2½-sty. brick dwelling, 19 Westminster avenue, $5,000; C. S. Gray & Sons, 2 detached 2½-storey brick and stone dwelling, near Garden, Glendale, $7,000; G. W. Dale, 4 attached 2-sty. brick dwellings, 42-48 Fenwick avenue, $6,000; H. Thomas, pair semi-detached 2-sty. brick dwellings, Emerson $4,000; W. H. Walsh, pair semi-detached 2-sty. brick dwellings, 43-45 Endean, $4,600; W. R. Waters, pair semi-detached 2-sty. and attic brick dwellings, Russett avenue, $4,000; F. W. J. Hill, 2-sty. brick dwelling, Brick avenue, $4,000; Jas. Hepbourne, pair semi-detached 2-sty. brick dwellings, 1228-30 Dufferin street, $4,000; T Holmes, 2-sty. and attic brick dwelling Foxbar road, $4,200; J. W. Clare, pair semi-detached 2-sty. brick dwellings, Ossington avenue, $4,600; Houghton & Breeze, pair semi-detached 2-sty. and attic brick dwellings, 369-371 Grace street, $4,200; John Hoidge, 2½-sty. brick dwelling, Major street, $4,000; Mason & Risch Company, 6-sty. reinforced concrete, brick and steel warehouse, 230 Yonge street $100,000; Austin Construction Company pair semi-detached, 2-sty. and attic brick dwellings, Binscarth road, $6,000; J. E. Peterkin, pair semi-detached 2-sty. brick dwellings, Symington, $4,000; Wm. Cayea 2 detached 2-sty. and attic brick dwellings Sorauren, $5,000; H. Watkinson, 3 attached, 2½-sty. brick dwellings, Hook avenue $7,000; Weismiller & MacKenzie Bros., 3 detached 2-sty. brick dwellings, near Roncesvalles, West Marion, $9,000; Garfunkel & Goldstein, pair semi-detached 2½-sty. brick dwellings, corner Baldwin and Augusta, $8,000; D. A. Williams, 2-sty. brick dwelling, Westmintser, $4,000; C. D. Easton, pair semi-detached 2-sty. brick dwellings, Prospect, $4,000; A. Bollard, 2 detached 2-sty. brick dwellings, Binscarth road, $10,800; W. S. Grimshaw, 6 attached 3-sty. brick stores and dwellings, 954-964 College street, $20,000; W. B. Galbraith one 2-sty. and one 2½-sty. brick dwelling near Highland, Glen road, $8,000; H. W. Campbell, 2½-sty. brick dwelling, Annette street, $4,900; Toronto Auto Garage Company, 2-sty. brick and steel garage, 21 Dupont street, $20,000; Separate School Board, 2-sty. brick addition to school, Bolton avenue, $9,000; Hugh McWilliams, 2 pair semi-detached 2-sty. brick dwellings St. Helens avenue, $11,000; E. Stone, pair semi-detached 2-sty. brick dwellings, 769-771 Shaw street, $4,000; J. H. Lennox, 2 pair semi-detached 2-sty. brick dwellings near Woodbine, Hartford, $8,000; J. J. Walsh, 4 detached 2½-sty. brick dwellings 16-22 Star ravenue, $10,000; Geo. T. Lee 2-sty. brick dwelling, near Conduit, Woodville, $4,000; R. O. Dickson, pair semi-detached 2-sty. and attic brick dwellings corner Empress and Starr, $4,400; J. J. Tracy, pair semi-detached 2-sty. brick dwellings, near Bloor, Lansdowne, $4,600; Mr. Goldstein, pair semi-detached 2½-sty brick dwellings, 90-92 Esther street, $4,600; Miss Wilheim, pair semi-detached 2½-sty. brick dwellings, Carlaw avenue, $4,000; J. H. Stanford (in trust), 3 pair semi-detached 2-sty. brick dwellings, 1229-1239 Bathurst, $12,000; Mrs. S. Armitage 2-sty. brick dwelling, Sunnyside and Geoffrey, $4,000; Nasmith Company, Limited 2-sty. brick factory and stables, Duchess street, $60,000; John Morrison, 4-sty. brick apartments, 603 Jarvis street, $20,000.

Victoria, B.C.

Recent building permits include: Victoria School Board, repairs to South Park school, $3,300; S. E. Matthews, dwelling Richardson street, $4,000; Thomas MacLaughlin, dwelling, Clarence street, $3,000

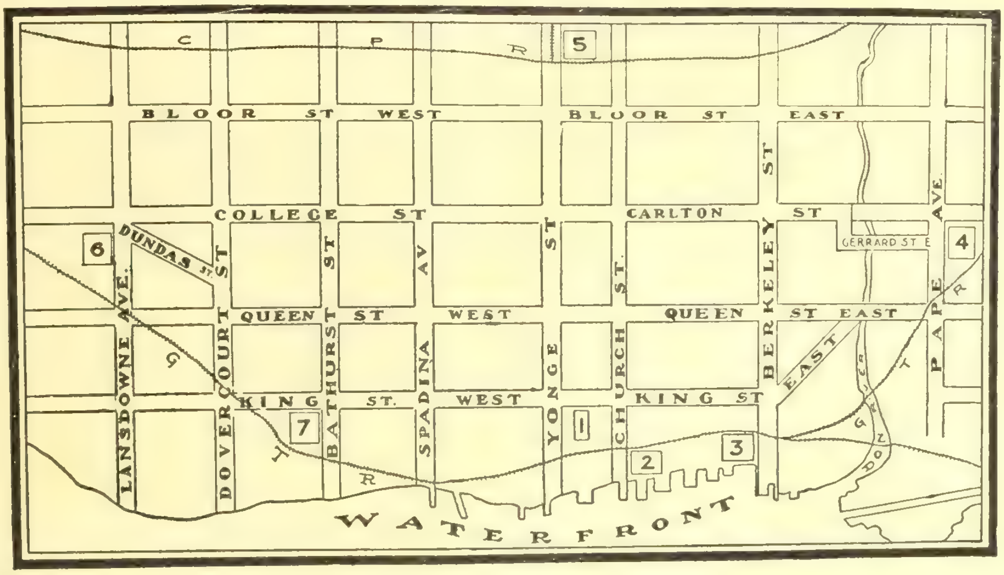
Winnipeg, Man.

Tenders will be received by W. H. Field until August 19th for purchase of $10,000 six per cent., 20-year debentures of the Swift Current school district.

P. D. S. a New Feature

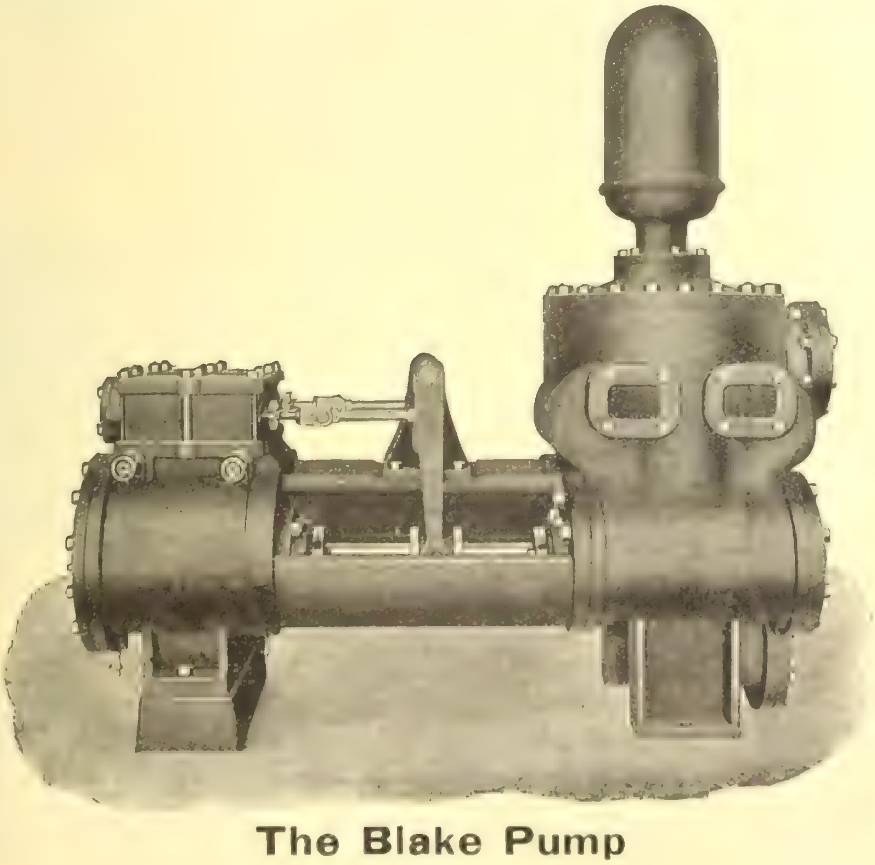
CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone Main 4155 No's 2, 4, 5, 6



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto



The Blake Pump

STEAM PUMPS

FOR

BOILER FEED

AND

GENERAL SERVICE

CARRIED

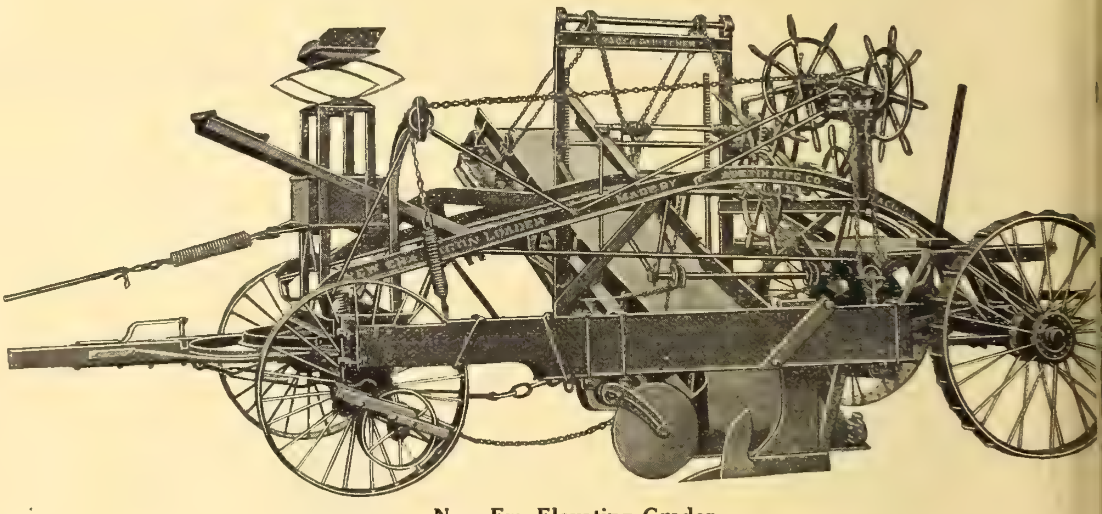
IN STOCK

WORKS—MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS COMPANY LIMITED

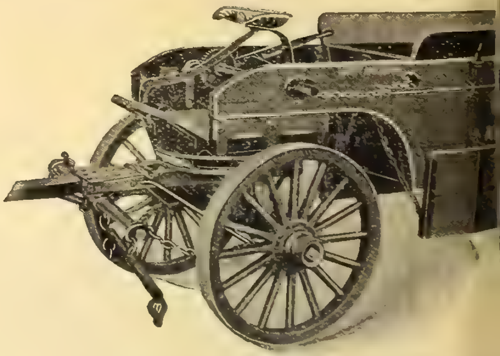
Elevating Graders

for Railroad Grading, Irrigation Work, Municip
Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment



Austin Dump Wagon

Head Offices and Warehouses :

Montreal

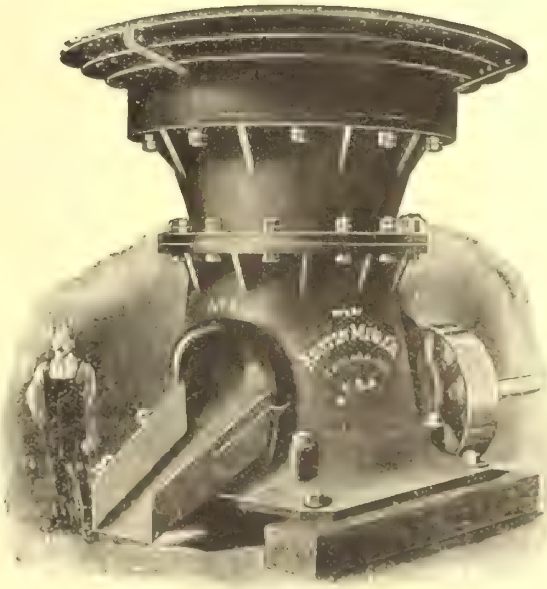
MUSSEN

mplete Rock Crushing Plants

signed and Supplied

- Crushers
- Elevators
- Screens
- Bins
- Hoists
- Derricks
- Rock Drills
- Drill Steel
- Cars
- Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

3rd Edition is Out

and free to Architects, Contractors and Engineers

Glidden's Advanced Finish Booklet for Modern Building Construction

gives full data and specifications covering the finishing and waterproofing of concrete

Address

The Glidden Varnish Company, Cleveland, Ohio
Concrete Finish Department

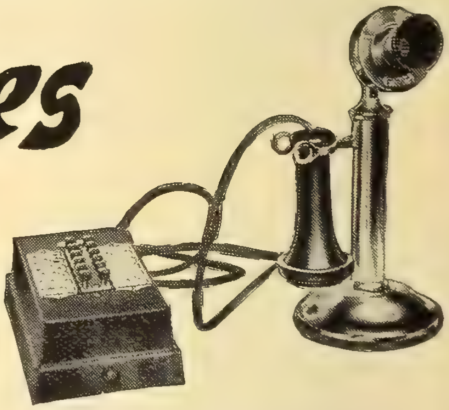
or

Stinson-Reeb Builders Supply Co., Montreal, Quebec

FACTORIES	BRANCHES
Cleveland, Ohio,	Atlanta, Boston, Chicago,
Toronto, Ontario	New York and St. Louis

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.



No. 2016—Type-Metal Inter-phone for desk use

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 413 with full particulars.

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Published Each Wednesday by
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative

WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives

VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative

LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto August 10, 1910 No. 32

Foreign Plans for Canadian Work

The majority of us are in favor of fair competition and listen very often with little sympathy to the whinings that go up from so many quarters whenever a contract finds its way across the border. At the same time, however, there must have been occasions of late when the murmurings reached us more responsively; when it has seemed that there was a most unfortunate lack of consideration for Canadian building interests.

It is difficult indeed at times to understand why an American architect or engineer is entrusted with the plans for some particularly interesting work. The difficulty lies in reconciling such a course with the facilities we have for turning out good men and with the numbers of good men that are turned out. Readers of this journal are concerned with the question mainly because when a set of plans are prepared by an American architect or engineer, it is almost a foregone conclusion that an American contractor will get the work—not so much on account of favoritism or prejudice as owing to the advantage an American contractor has in interpreting American plans and American specifications. Whether the advantage is as great as is represented by Canadian contractors, it is hard to say, but certain it is that the chances of the Canadian contractor can be discounted 50 per cent. when an American practitioner is employed.

One reads articles both in the daily and in the technical press the prevailing idea of which is that Canadians should be employed by Canadian institutions from motives of loyalty to the country which has yielded produce and riches to those institutions. We cannot see eye-to-eye in this unless it can be shown clearly that our constructive talent is equal to that of any other country.

To our way of thinking, it is not a case for dickering over patriotism, loyalty to home institutions and so forth. We must succeed on our merits and when it comes down to business, in these days, one can afford to be neither patriotic nor philanthropic. It is the best work for the best figure that is required every time. The question that presents itself to us is whether our engineers, our architects and our contractors are getting a fair chance on the occasional plums offered in the Canadian field or whether they are overlooked on the assumption that they are not properly equipped or not sufficiently trained to carry out important work. From the records of dozens of firms in each of the lines mentioned the alternative falls to the ground. We have men, the brains and the capital to design and execute to the very best advantage any kind of engineering or building problem that may turn up in Canadian territory. And that is saying something. Across the border they are also well equipped, but the advantages are with the men who are already in the field and who by birth and training or by years of association have learned to anticipate to some extent and to plan for these projects.

Patriotism and philanthropy are very beautiful, but they play a small part in business. It is shrewdness, tact, foresight, hard-headed common sense and the ability to recognize value for value that count. To what extent those responsible for the award of a few recent contracts are endowed with these qualities it is hard to estimate. There are some who can learn nothing but by experience and it may be that those referred to will discover before long that they have purchased the jewel "at an infinite rate."

The city of Vancouver is facing the problem of providing a better means of dredging hardpan. Much difficulty has been encountered of late in the construction of sewers on account of the depth of hardpan which has to be blasted. A plant for the dredging of hardpan would cost approximately $15,000. This plant would do as much work as 100 men and it is believed that sooner or later the city will have to purchase one.

Construction work upon the new Toronto General Hospital will be commenced early this fall and will be continued steadily through the winter. It is confidently expected that the work will be proceeded with throughout the winter without any interruption and that the out-patient and emergency departments will be ready for occupation by the spring of 1912.

The city engineer of Hull, Que., has issued strict instructions that in future all buildings erected must comply completely with the city by-law regarding fire protection. In future, permission to build will not be given unless the plans and specifications are in conformity with the fire protection clause of the city by-law.

Stave Lake Hydro-Electric Development

Engineering and Constructural Features of the Work—Advantages of the Sluice Dam — Details of Methods and General Progress

Stave Lake is situated about 36 miles due east of Vancouver, B.C., and about 12 or 15 miles north from the Fraser river and the main line of the Canadian Pacific Railway. The lake is some 10 miles long, and its source is mainly the Upper Stave river, flowing in from the north; but other streams of smaller size also contribute to the lake supply. The snow-and-ice sources, at elevations not to be materially denuded of their natural forest growth, nor to be polluted by the progress of civilization for generations to come, if ever, afford permanence of volume and consequently enhanced value to the outflowing Stave river, upon which a hydro-electric power plant is under development at the Falls, some six or seven miles below the lake outlet, and only six miles from Ruskin station on the Canadian Pacific Railway, the point where the Stave empties into the Fraser river.

Stave Lake—Stop Log Dam under construction.

The scheme decided upon by the engineer was to erect a concrete dam across the westerly channel at the crest of the falls, the structure to contain steel-cased apertures, or bell-mouth inlets, for steel flumes about 250 feet long, to lead downward over the slope or bed of the falls, to a power house to be built across the channel at the foot. The effect of the dam would be entirely to stop the westerly flow, excepting that quantity to be conveyed through the flumes and utilized in driving the turbines. Another part of the scheme provided for a sluice dam, also of concrete construction, to be built across the easterly branch, at a point about 100 feet upstream from a projected line of the intake or westerly dam, the two dams to be united by a concrete wing dam paralleling the general line of the river, and dividing the forebay, from the run of water wasting through the sluice dam.

After removal of a heavy log jam of huge and medium sized logs and trees, accumulated at the entrance of the westerly channel, between the head of the island and the westerly shore, various obstructing rocks were blasted from the river bed and shores, between the temporary dam and the crest of the falls. The purpose was to prevent a recurrence of timber jams, and to enlarge this smaller channel sufficiently to take care of the greatest known summer flow when later on, the temporary dam should be removed and the entire run of the river turned in during stoppage by temporary dam, and enlargement of the easterly channel, and the construction of the massive sluice dam piers in its bed.

The plan provided that the dams be built some 34 feet above river bed elevation, creating, with tail race excavation, from 90 to 95 feet effective head. That elevation of dam also provided for a lake storage of from 6 to 7 feet depth above normal lake level. Reorganization of the company and the enlargement of its financial scope led to increasing the height of dam to an elevation for 100 feet working head, and changing the plan from five units of 6,000 h.p. each, to one of four units of 10,000 h.p. each, in addition to two independent exciter units in either instance. With the enlarged storage capacity at the lake and the greater working head at the power house, the plant when completed will be in a position to market 40,000 h.p. at lowest stage of river flow. The storage of water controlled by the present height of dam amounts to between 12 and 15 square miles of area. Provision has been made for further increasing the elevation of dam and lake storage, to yield at least another 10,000 h.p. when required.

A leading feature in the hydraulic scheme is the sluice dam and its stop-log system. Four concrete piers are erected in the enlarged bed of the easterly branch of the stream. An abutment pier at the easterly shore and the wing dam at the westerly (on the island), together with the piers, form five sluices, varying in depth from 32 to 37 feet, and having uniform width of 22 feet each in the clear. Stop-log checks, of steel, are formed in the piers, abutment and wing dam, 12 inches deep and 18 inches wide, and extending from top to bottom of the sluices. The bottoms of the sluices are of concrete and each has an anchored sill of British Columbia fir embedded to within an inch of its top face. The sills are 24 inches square and extend across the sluices from back

Stave Lake—Up-stream side of Stop Log Dam—Travelling Stop-Log Winch shown on left side.

Stave Lake Sluice Jam—Up-stream side without Stop Logs.

to back of the stop-log checks. The stop-logs are likewise of fir, bolted together in pairs, each log having a depth of 16 inches (32 inches to the pair), and a length of 23 feet 10 inches. The widths vary from 24 inches for those near the sluice bottom, to 16 inches for those near the top.

A pair of travelling winches (shown in view), operated by electric motor, or by hand in case of emergency, move along a track over the piers, from sluice to sluice, and insert or remove the stop-logs as may be required. The winches are capable of manipulating the stop-logs in any one sluiceway, regardless of the depth or swiftness of water flowing through, and lift out or insert the lower stop-logs with the same precision and effectiveness as the upper ones.

The river is subject to sudden fluctuations, the surface elevation rising sometimes as much as twelve feet within 48 hours, and the total variation is over 16 feet between extreme high and extreme low water. The elevation of the lake surface is likewise subject to as great variation, under natural conditions. In designing a dam to give such excessive and quickly required vent and yet capable of controlling the greatest possible proportion of the water, it was clear that some type more economical than the ordinary overoflw dam and more certain of action than the common waste-gate style, must be adopted where British Columbia fir trees in their entirety, logs, shingle bolts and debris, are frequently afloat and on the rampage. The simplicity and liberal discharging capacity of a sluice dam to comprise five sluices, each 22 feet wide in the clear, and over 30 feet in depth, and equipped with staunch wooden stop-logs reliable for quick removal and as quick replacement, was deemed the solution of the problem.

The concrete piers for the sluice dam were built in the summer of 1907. They are strongly anchored to their rock foundation, are reinforced with steel and protected with half-inch boiler plate nosings. The intake dam, the power house and excavation of tailrace, as well as construction of a spur line of railway from the C.P.R., are all works now in hand. The steel flumes from the intake dam will be 14½ feet internal diameter, with two independent flumes of smaller diameter for the exciter drives. The headgates of flumes are planned to be of the pivotted type and of steel construction. Stop-logs will also be provided for emergencies.

The purpose of the plant is to generate electric power for transmission to Vancouver, New Westminster, and other centres, for operating tram lines, industrial plants, and for furnishing light, etc.

The work was commenced and actively carried on for some three years by the Stave Lake Power Company, Limited, but has been taken up by the Western Canada Power Company, of which Mr. C. H. Cahan, of Montreal, is the president, and Mr. John Hendry, vice-president; Mr. R. F. Hayward, general manager and chief engineer, and Mr. Wm. Kennedy, C.E., of Montreal, consulting engineer.

Architectural Use of Concrete

The extensive use, during the past decade, of reinforced concrete in engineering and architectural construction has occasioned much discussion as to the rational architectural handling of this composite material. In a recent issue of the "Architects' and Builders' Journal" (London, Eng.) such a discussion appears containing conclusions with which it is difficult to agree. The contention that Gothic tradition is excluded as a source of inspiration seems unwarranted. If the author of the article referred to confines his assertion to the English conception of Gothic his conclusion becomes narrow as well, for the spirit of mediæval architecture reached Great Britain only in its decadence and, therefore, very inadequately presents its governing motive. In France, Gothic architecture is a true reflection of the struggle of the Christian Church to establish an enduring system of government which should be all-embracing, recognizing as paramount the spiritual, but not forgetting the worldly and spectacular. The buildings it produced are the most mysterious and, except some of the be-jewelled palaces of India, the most spectacular works of existing architectural art. The effect they produce is of infinite aspiration with their towering vertical lines, their vast unobstructed spaces with isolated points of support and lofty vaulted ceilings. The richness of their visible portions is to be ascribed to the tendency of the Middle Ages to individual effort in art. Therefore, they were built of stone which could be readily set in place, richly moulded and carved, and refined and added to, subsequently.

There seems no fundamental reason given the highly organized building system of the Romans with its armies of slaves and supposing as contemporaneous with it the religious ideals of mediæval times, why the Gothic cathedrals could not have been built by the Romans in concrete, in the use of which they were so expert. The result would, of course, have borne a different superficial aspect, but one can imagine nothing that could make the assumption untenable. How much more possible and more desirable then, are the governing principles of Gothic for contemporary inspiration in the architectural treatment of concrete when we have perfected a system taking advantage of the structural and plastic qualities of the material and making good its deficiencies by the addition of another element which possesses the one structural quality absent in concrete, the ability to resist tensile stress.

For reasons not brought out in the foregoing a Gothic cathedral in reinforced concrete might perhaps present undesirable aspects, but the value of Gothic principles in the handling of reinforced concrete in solving contemporary structural and artistic problems seems indisputable.—American Architect.

Great quantities of asphalt are reported to have been discovered in the region about Fort McMurray in northern Alberta.

Installation of Hot Air Furnace Heating

Recommended Practice for the most Satisfactory Results—Economy, Durability and other Points in Favor of the System

The health and comfort—and, we might also say, the peace of mind of the inmates of a building, depend to a very large extent on the adoption of a proper system for heating and ventilating the structure. This is true of the small house as well as of the large, of the skyscraper as well as the bungalow, and of the concrete house as well as that built of stone or brick or wood or other structural material. An efficient and economical installation for warming the structure equally, and at the same time keeping it constantly furnished with an adequate supply of fresh air—for these two functions are very closely related—is a matter of vital importance. Every home-builder and home-owner, everyone engaged in or interested in building construction, should understand at least the elementary principles involved in the selection and mechanical installation of a good heating and ventilating system.

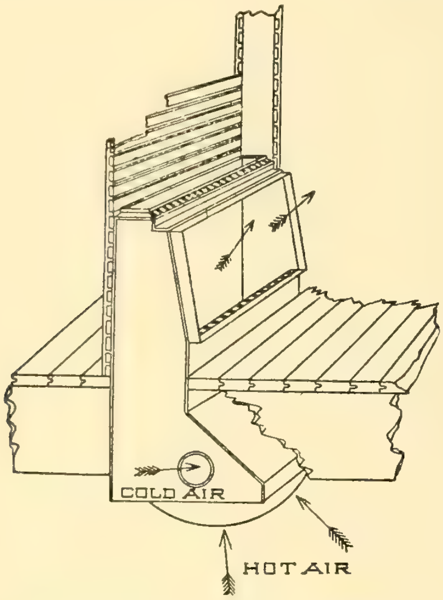


Fig. 1—Wall Prepared for Side Wall Register (Double Pipe)

Time was, and that not so long ago, when the builder gave little or no attention to the proper heating of a structure until every other part of it had been provided for. Now, however, the question "How shall I heat the building?" or "What type of apparatus shall I use?" is considered along with those relating to the other features that enter into the construction of the building, and the heating plant is arranged for as soon as the building plans are matured.

Build Warm

In providing for the installation of a modern heating apparatus, there are some features of building construction which should have the careful attention of the builder. The colder the climate, the greater the necessity for constructing the building in such a manner as will enable it effectively to resist the cold weather. The small additional sum required to make all parts of the structure tight, sound, and capable of resisting and excluding the cold, is, in a comparatively short time, more than refunded in the saving on fuel bills, to say nothing of the satisfaction of having a warm and comfortable home at all times, regardless of varying climatic conditions.

Air is a good insulator; and in building outside walls, provision should be made for "dead" air spaces. If of frame construction, the outer wall should be lathed and plastered tightly on the inside. The studding should be sheathed outside and the sheathing carefully covered with a good quality of building paper. A poor grade of paper is useless at any price. This surface should then be tightly and securely covered with shingles, matched siding, or clapboards. In a particularly cold climate, it is well to sheath the inside of the studding and "furr out" before lathing and plastering. Brick walls should in every instance be "furred out" on the inside; and in cold climates the use of double windows and storm doors is particularly advisable.

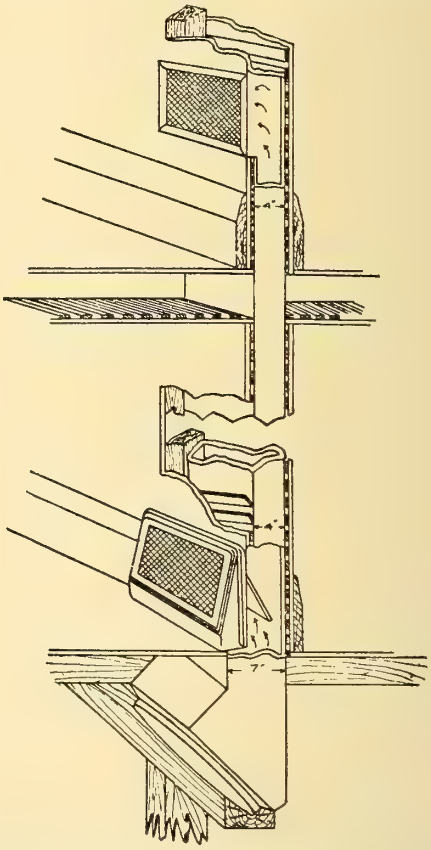


Fig. 1—Stack Supplying First and Second Floor Registers

The efficiency and the economical operation of the heating apparatus will depend largely on the accuracy with which the above suggestions have been carried out.

Advantages and Abuse of Hot Air Heating

There are sound and substantial reasons why the warm air furnace has so long retained its supremacy as a heating medium.

The advantage over steam or hot water or stoves is a pure, fresh warmed air (when the fresh air inlet is taken from out of doors) that in a properly constructed apparatus transforms the Arctic temperature without to a June day's balmy atmosphere within. Another great advantage is that no large, unsightly radiators cumber the room, take up valuable space, destroy carpets, spoil floors, and gather quantities of dirt and dust. And lastly, the cost is less than by any other system.

But heating with a warm air furnace has suffered at the hands of its friends as well as of its enemies. The fact that, unlike steam or hot water, it will still work even when poorly installed, or that a cheapened construction, omitting many of the essential features of a good furnace and using inferior material, does not entirely overcome its usefulness instead of being considered as it should be as a favorable argument is actually brought forward to condemn its use.

Cheap competition work incidental to large building operations where several houses or groups of houses are erected collectively in rows or in pairs and offered for sale by the builders—"operation work," as it is called—has resulted in the placing of thousands of furnaces too small in capacity to operate properly, and of so cheap a construction as to be practically worthless after a few season's use.

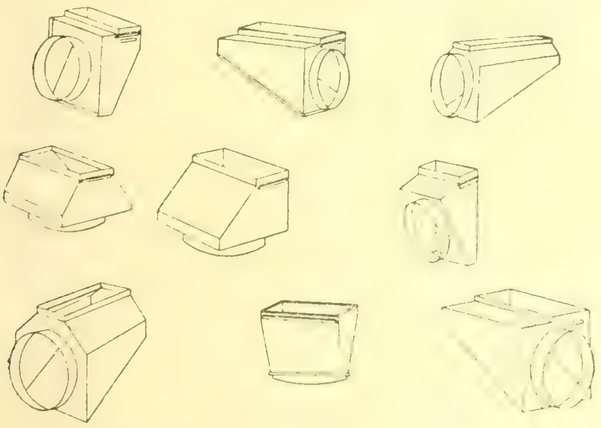


Fig. 3—Correct Forms of "Boots"

The cold air box may be omitted entirely, or, as is true in a large number of instances, be very poorly constructed, and there will naturally be complaints that the registers are dusty inlets and the system a dirty nuisance, but the fault is not in the system, for it works (heats) in spite of the defective air. While if a warm air furnace of the right size to properly warm the building is correctly installed, the air supplied will be healthful and pleasant. The proper preparation of a building for the installation of a furnace begins with the foundation, as the chimney for the use of the apparatus should be located in such a position that the furnace may be set well towards the north and west sides of the cellar or basement. The furnace should be placed in this position in order to have the shorter warm air pipes serve the colder part of the house, as it is extremely difficult to force warm air towards the north or west through piping of exceptional length.

Under ordinary conditions the furnace should be set not more than six feet distant from the chimney flue. It is far better, however, to double the length of the smoke pipe in order to be able to locate the furnace toward the west or north, than it is to double the length of the hot air pipes, if either one of these two contingencies arises.

Size of Furnace Required

Having determined upon the installation of a furnace, the first thing to consider is the size necessary. For arriving at this conclusion, there are several methods that can be adopted. We shall assume that it is desired to have an apparatus of sufficient capacity to heat all rooms (excepting the kitchen) to 70 degrees F. in zero weather. An excellent rule formulated by Mr. Charles S. Prizer is as follows:

"Find the cubic feet of space in room by multiplying the length by the width, and this product by the height. To the actual cubic feet of space in the room, add 75 cubic feet for each square foot of glass surface (outside doors to be figured as glass), and 8 cubic feet for each square foot of outside or exposed wall surface. For either a northern or western exposure, add 10 per cent. to the glass surface and 10 per cent. to the wall surface. For either a southern or eastern exposure, deduct 10 per cent. from the exposed glass and wall surface. Should double doors or storm doors be used, count outside doors as exposed wall instead of exposed glass surface. Add together the figures for all rooms to be heated, and the total will be the equivalent cubic feet of space to be provided for by the furnace."

This rule, it will be observed, takes into account the various exposures of each and every room. In the event of the house being located in a section where a temperature of 10 to 12 degrees above zero is the extreme degree of cold weather, 10 per cent. may be deducted from the "equivalent cubic feet." For locations where the extreme degree of cold weather is 10 degrees below zero, add 10 per cent. to the equivalent cubic feet; for 20 degrees below zero, add 15 per cent.; and for 30 degrees below zero, add 20 per cent.

Select a furnace having one square inch of grate area for each 150 equivalent cubic feet of space to be heated.

Location and Size of Registers and Flues

Registers should be located along or in the inner walls of each room. All cellar pipes should have an upward pitch of not less than one inch to the foot, and as much more as possible. There is no exception to this rule. Never mind if the bay window is at the opposite side of the room; get the warmed air into the room with just as short a pipe and as few bends as practicable. Formerly it was considered good practice to use floor registers for all first floor rooms, and wall registers for the rooms above the first floor. However, the recent introduction of the improved side-wall register has changed this former idea. By the use of this type of register in a 3 or 4 inch wall, opening for a flue at least 7 inches deep is obtained by cutting out 2 inches of the floor. This, altogether with the space of one inch occupied by lath and plaster, gives a flue three inches deeper than the studding, and allows the placing of an effective register for warming first floor rooms. In a similar manner a single flue can also be made to heat a first and second floor room, thus simplifying the piping system and lessening the number of pipes in the cellar.

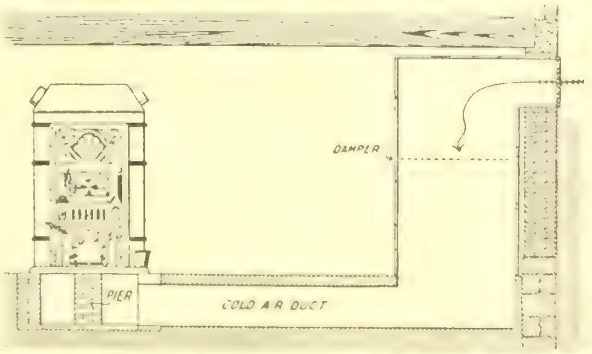


Fig. 4—Arrangement of Cold Air Reservoir and Duct

There is much to be said deregatory to the use of the floor register. It is a dust and dirt collector; it frequently interferes with the desired placing of furniture and often necessitates the cutting of carpets. All these adverse conditions are obviated by using the side wall register. Fig. 1 shows the wall prepared and the opening cased ready for the insertion of the cast iron register frame. Fig. 2 shows a stack supplying the first and second floor registers. The double "safety" wall piping is used in both these figures. Note that by this arrangement, as cited above, the depth of the flue supplying the first floor is 7 inches. A baffle-plate divides the flow of warm air, furnishing each floor with its proper proportion of heat.

The fitting at the bottom of a stack, or vertical duct, supplying a register, is termed a boot. The round pipe in basement conveying hot air from the furnace is connected to a boot which must be so arranged as to receive the full volume of this round pipe and distribute it to the riser with the least possible amount of friction. A variety of designs are therefore necessary to answer suitably certain requirements, and fig. 3 shows a number of correct forms.

The fitting at the top of a riser or flue is termed a flue head or register box. These are made in a form to supply a single register, or they may be so arranged as to be suitable for supplying registers on opposite sides of the partition.

In the running of all furnace piping, abrupt bends and acute angles should be avoided, so that the heat-carrying pipes may offer the least possible amount of friction or resistance to the flow of warm air through them.

All hot air pipes should be covered with asbestos paper, or, better, with asbestos air-cell covering. Another type of furnace piping, especially desirable for partition piping, being required by law in some cities, is called safety pipe, and is of double construction with an air space between the two layers of metal. A small opening through the outer pipe in the boot admits cellar air.

The accompanying table will give the measurements of registers necessary for supplying certain sizes of rooms, the sizes of the round pipe in the basement conveying warm air from the furnace to the boot. In all cases where two or more rooms are heated from one pipe, this pipe must have sufficient capacity to carry the required amount of warm air for all rooms served by it, according to the information given in the table.

SIZES FOR FURNACE PIPES AND REGISTERS.

Size of Room (Cubic Feet of Space)	Size of Room (Floor Space if 10 Ft. Ceiling)	Size of Round Pipe in Cellar	Size of Register and Register Boxes	Area of Open Space in Register (Bars Removed)
500	6x 8	7 in.	6x 8 in.	35 sq. in.
850	8x10	8 in.	8x10 in.	45 sq. in.
1,000	9x11	8 in.	8x12 in.	55 sq in.
1,250	10x12½	9 in.	9x12 in.	60 sq. in.
1,650	12x14	9 in.	10x12 in.	70 sq. in.
2,000	12x17	10 in.	10x14 in.	80 sq. in.
2,300	14x17	12 in.	12x15 in.	115 sq. in.
2,600	15x18	12 in.	12x17 in.	120 sq. in.
3,000	15x20	14 in.	14x20 in.	156 sq. in.
4,000	20x20	16 in.	16x24 in.	210 sq. in.
5,400	20x27	18 in.	20x24 in.	270 sq. in.
7,000	20x35	20 in.	21x29 in.	340 sq. in.

No hot air furnace will do its work properly unless provided with an adequate cold air supply. In the cheap form of installation it is invariably noted that the furnace is supplied with basement air through a fretwork base of the furnace. Aside from showing poor practice, this method creates an unhealthful condition. Air from outside the building itself should be used and the necessary supply should, if possible, be admitted from the north or northwest sides. A cellar window may be utilized for the purpose. Just inside the cellar window or other similar suitable opening, the cold air duct should be enlarged to about three times the required capacity. From the bottom of this duct the connection with the furnace may be made, the pipe running either below the floor of the cellar or above it, according to circumstances surrounding the installation. This large duct forms a reservoir for the accumulation of cold air, and this reserve supply prevents prevailing high or variable winds from interfering with the steady flow of air to the furnace. Fig. 4 will illustrate this idea. The outside entrance to the opening should be protected with a coarse wire screen fastened in a permanent manner.

In size, the cold air duct should have three-fourths of the area of all heat pipes leading from the top casing. For example, let us assume a job having:

One 8-inch heat pipe, capacity	50 sq. in.
Two 9-inch heat pipes, capacity	126 sq. in.
Three 10-inch heat pipes, capacity	234 sq. in.
Total	410 sq. in.

Here the total area of the heat pipes is 410 square inches. Three-fourths of this total capacity is 307 square inches; therefore the dimensions of the cold air duct should be 12 times 25 inches or 300 square inches.

Whether the furnace should be set over a pit or whether the air supply should be connected at the ash pit level is a matter of divided opinion. If set over a pit, the heating contractor should make sure that there is no liability of water filling it, as that would shut off the supply of air. He must also see that the connecting duct is carefully laid, and either bricked or cemented on the bottom and sides, with a dust-tight cover. It is also advisable to have a suitable manhole through which one can enter the duct, so as to occasionally clean out any accumulated dust or other refuse.

If a duct above the basement or cellar floor is used, it should by all means connect directly at the back of the furnace. This ensures a more even distribution of the air to all the pipes.

One further word of caution: Do not take the fresh air supply from a point liable in any way to contamination by sewer, drain or stable air. Neither is it wise to take it through an inlet that opens into a narrow passage between two buildings, or between a house and a tight board fence. The winds circulate through such passages with high velocities, and often act on the air within the heater, as the jet of air in an atomizer does upon the liquid in the bottle, simply syphon it out.

A very successful method of warm air heating takes no fresh air from without, but circulates the air within the building by means of one or more ducts leading from the heated rooms back to the base of the furnace.

The enthusiastic advocate of this method cannot emphasize the ventilating features of warm air heating, but he is safe in saying that it is just as sanitary as direct heating by either steam or hot water.

The practice common in many sections of taking the air supply from the cellar cannot be too strongly condemned. No one would think of sleeping or eating in the cellar, yet many thoughtlessly are taking the cellar air with its attendant dust and contamination and, after heating it, using it as the living atmosphere of the occupied apartment.

Doctors and scientific experts all agree that a constant supply of fresh air is absolutely necessary. With a good warm air furnace of ample size and properly located, a constant supply of pure, fresh air is furnished at all times and every room and hall is well heated.

Incompleteness of Plumbing Specifications

There is nothing entering into the construction of the modern building which is more intimately associated with the health and comfort of its inmates than the plumbing. Under this general term is included the drainage from and water supply to the fixtures, the proper arrangement of all traps and vent lines, the heating of the water and the apparatus therefor, the proper installation of all plumbing fixtures, and such mechanical appliances as house and fire pumps, suction and supply tanks, etc.

The plumbing system for a building may be very aptly compared with the circulation and intestinal systems of the human body. The water supply lines are the arteries which carry the life giving fluid to the remotest corners of the structure; the sewers the intestinal canal through which the waste matter is discharged.

Architects' Plans Lack Information

Notwithstanding the important bearing of the plumber's work it is, as a rule, given very little study by the average architect in the preparation of his plans and specifications. He will elaborate most exhaustively on his construction and materials which go to make up the superstructure, making numerous full size detail drawings of doors, windows, interior and exterior trimmings and decorations, but when it comes to the plumbing, the most important of all from the standpoint of health and convenience, he is woefully lax in his instructions to the plumbing contractor. And it is greatly to the credit of the much maligned plumbing trade that such good work is produced with such meagre assistance as the plumber gets from his plans and specifications.

The architect in drawing up his contracts usually stipulates that the plumbing must conform to the drawings and specifications, which would necessarily imply that the drawings and specifications contained all the information that might be necessary for the plumbing contractor to not only give an intelligent figure on the work required, but also to carry out his contract in a manner to ensure the very best results obtainable. But let us turn to those same drawings and specifications, and what do we find? The average building plans show us a toilet room located here, a sink there, lavatories scattered promiscuously, with a few lines on the basement plan to indicate the general direction of the sewer, but nothing more. It is up to the plumber to figure, if he can, how he is to reach the various fixtures with his lines; where to locate his water heater, pumps, tanks, etc.; where to install his risers and vent lines, and how he is to keep out of the way of the steel contractor, the heating contractor, the electrician, the sheet metal contractor, and, in fact, every other artisan on the job; for it seems to be the generally accepted rule that the plumber must give way to all of these more favored trades and crowd his work into impossible out of the way places, working under handicaps which would hardly be tolerated in other lines of building construction.

On the drawings he finds not a line to indicate where his water lines are to go or the size thereof; and as for locating his basement machinery, let him get along with whatever space the other contractors have no use for. The incomplete nature of the drawings is oftentimes to some extent recompensed by a carefully detailed specification, but, unfortunately, the specification is generally indefinite and inadequate, abounding in such terms as "pipes of ample size," "valves satisfactory to architect," "water heater of sufficient capacity," etc., thereby placing upon the plumber almost the entire responsibility for the designing and proper working of the system, and woe betide him should his judgment be at fault.

Meagre Details Prevent Close Figuring

A case in point came to the writer's notice not long since. A large building involving more than the usual amount of plumbing was designed, and plans were submitted to some half dozen plumbing contractors with a request for bids on the work. Beyond showing the location of the various toilet rooms and the fixtures therein, there was not a line in the drawings to guide the bidder, and, as for specifications, there were absolutely none, each bidder being requested to submit his own specification with his bid. Each of the bidders, after spending a great deal more time in figuring the job than would otherwise have been necessary, submitted his proposition, but all to no purpose, as such a wide variation of ideas was found and such a lack of uniformity in the cost of the work that the designers were compelled to readvertise for bids on a uniform and carefully drawn plumbing plan and specification.

What Plumbing Plans Should Show

The plumbing for a building should be so indicated in the drawings and described in the specifications as to cover everything required, and so clear and concise as to be readily understood by the average plumbing contractor. The positions of all mechanical appliances in connection with the plumbing should be clearly shown upon whatever floor plan such appliance may be located. All runs of piping through basement, together with the size of same, should be concisely indicated in the basement drawing. House traps, bell traps, area drains, sump pits, conductor lines, etc., should be located beyond dispute.

In addition to the plumbing lines shown on the plans there should be prepared a riser diagram showing the serving of each and every fixture on each floor of the building. This riser diagram should show clearly all water lines, waste lines, soil lines, vent lines, fire lines, etc., at each and every floor throughout the building, giving the relative position and arrangement of the waste and vent lines for each fixture with the sizes of all lines plainly designated. Pipes of the various characters can be indicated by different kinds of broken or dotted lines, with a properly arranged index on the drawing, showing the kind of service each line performs.

Where there are groups of fixtures, and where it is desirable to show connections to pumps, house tanks, filters, etc., it is advisable to prepare, on a larger scale than is ordinarily used, a detailed drawing showing the exact arrangement of all piping, together with all fittings, joints, valves, traps, etc., but where the plumbing is ordinary straight and simple work such detailed drawing may be omitted.

The specifications should indicate in the clearest possible manner the quality of the materials to be used and the method of installation. The location, size, depth and general direction of the street sewer, if there be any, should be clearly described, and if there be no street sewer, the final disposition of the sewage should be given in detail.

The location and size of the city water main from which the water supply is to be taken should be plainly stated along with the water pressure at source of supply. This information can be obtained in any well regulated municipality, where it is always kept on file. The specification should list accurately the number of each style of fixtures to be located on each floor of the building and should give such an accurate and detailed description of such fixtures and the trimmings as to leave no doubt as to what is desired.

Builders' Grievances — Real and Unreal

With Special Reference to the former—One-sided Contract Clauses—Insufficient Time Limits—Unreasonable Delay in Settlement of Accounts, etc.

Evidence from time to time turns up as to complaints which the building trade make in regard to the treatment which they either do actually receive, or which they think they are liable to receive, at the hands of architects and building owners, under certain circumstances, in connection with the carrying out of buildings, says a writer in the "Architects' and Builders' Journal." Some of these are very real grievances, injustices which ought not to be countenanced at any time; some of them, we are inclined to think, are to some extent imaginary, in the sense at all events that they are possible rather than probable. It may clear the ground a little if we consider some of the points that have come under our notice from time to time, not solely from the point of view of either architect, builder, or building-owner, but with the endeavor to represent impartially the claims of each.

Difficulty of Finding Good Workmen

The first subject on our notes is not a grievance against any person or persons, but against things in general. It is said that there is an increasing difficulty in finding the means of maintaining an adequate supply of such skilled workmen, and that builders are anxious as to workmen, who have become more and more scarce with the decline of the apprenticeship system. And truly, on this head, it is difficult to find any consoling words, or to offer any suggestions. Technical schools, it is said, do not meet the requirements. There are not enough of them in this country at present, in any case, to supply the demand as far as numbers are concerned; but the experience of employers seems to be that the lads who come out of such institutions as the London County Council training schools, for instance, however their instruction may have fitted them to work out the problems set them in the schools, have not the faculty for turning their hands to actual building work. It would be of interest to know whether this is the same in Germany, where technical schools are more numerous, larger, and possibly better equipped than in England. But we doubt if the best technical school will really make a workman, though it may give him a better general understanding of principles of construction than he would otherwise have. The only real remedy seems to lie in an endeavor to revive the apprenticeship system—an endeavor which, on general grounds, would evidently receive the sympathy and might count on the support of many people, outside of the actual building trade, who are anxious for the well-being of the country and for the adequate practical instruction of boys of the artisan class.

By-laws

The Federated builders claim that it would be advantageous to call them into consultation when by-laws are being revised, and that for want of this by-laws are passed which are inconvenient and oppressive, as well as unpractical. We should be in favor of such societies being asked if they had any suggestions or criticisms to make, mainly in fairness to themselves, since they would be the persons at whom a new set of by-laws would be mostly aimed. But for that very reason they must remember that they are interested parties whom the new legislation would chiefly affect, and they could hardly expect, therefore, that their judgment could have the same weight as that of persons who were acting solely in the general public interest. Apart from this, the idea is a reasonable one, and we should support it.

Tenders

It is said when the lowest tender is not accepted, builders find it difficult to rid themselves of a suspicion that the tenders have been invited with the object of checking the figures of some favored firm for whom the job was originally intended. That we should regard as one of the wrongs which are "possible, but not probable." There is such a thing as being too suspicious. Corporate bodies are often very stupid, but we do not think they are in general deliberately dishonest; and if they wanted to check the figures of a favored contractor they could do it by a less clumsy and unprincipled method than setting a number of other contractors to work at a sham competition. And provided that it has been clearly advertised that "the lowest tender will not necessarily be accepted," there are occasions when it is wiser not to accept the lowest tender, i.e., when it is so low that it is obvious that the tenderer could not honestly make a profit out of the work. Such a situation is not likely to lead to results satisfactory to anyone concerned. With the complaint that too short a time is often allowed for the satisfactory preparation of an estimate, we are entirely in sympathy; it is a great mistake, and an entirely unnecessary one, to hurry builders over estimates for an important work—a mistake which may lead to trouble and inconvenience afterwards. Builders are also entirely justified in objecting to their lists of priced quantities being opened, except that of the accepted firm. Those are trade secrets which ought to be respected, and if it is an actual fact (as we are informed) that in a Government competition recently such a sealed list was opened contrary to the advertised conditions, it was a most improper proceeding—so much so, that we should imagine it must have been the result of a misunderstanding or forgetfulness of the conditions on the part of some official. Government departments, in this country at all events, are not in the habit of breaking faith with those who deal with them.

Quantities

Much has been said recently on behalf of the builders as to the hardship inflicted on them by the refusal in some cases to supply quantities; and where it is a case of competition tendering we quite concur in the complaint; in fact, it is not only a hardship, but an absurdity, to compel a dozen or a score of people each to do the same work, by which only one of them can profit. But it ought to be pointed out that the duty of the building-owner, through his architect or surveyor, to supply quantities and pay for them, only arises in the case of competition tendering. We have heard it mentioned as a sort of hardship on a builder that he should have to take out his own quantities, even in a case where there was no competition, and where merely one man's estimate was asked for. That surely implies a forgetfulness of the whole history of the subject. The very existence of the profession of quantity-surveyor arises out of the system of competition tendering; it is employing one man, at a fee, to do what otherwise a number of men would have to do without advantage to any but one of them. But apart from competition tendering, and before that system (a very bad one in many ways) became so general, the quantities were manifestly the builder's own business. It was nothing to the architect or the building-owner how many rods of reduced brick-work, or how many feet run of a stone cornice, there would be in a building; it was for the builder to find out that in order to make his estimate. The competition tendering system makes all the difference, of course; but that was the original position, and it is only in comparatively recent years that the quantities have been supposed to be anyone's concern except the builder's.

Contract Conditions

No one can be surprised that the builders are beginning to grow restive under the drastic conditions often imposed on them in contracts and specifications, which, as it has been expressed, seem often to be drawn up on the "heads--I-win-tails-you-lose" principle. Everything is to be "the best," and the contractor is made responsible for other people's blunders and even for "the act of God or of the King's enemies," as the legal jargon runs. No doubt there are some contractors who require tying up very tight; there are others whose pride is to make a good piece of work, and who ought to be regarded and treated as allies rather than as enemies. Then the hotly debated question comes in of referees in case of dispute. It may be said that where there is a good architect on one side and a good builder on the other, disputes seldom arise; disputes are usually the result of one party or the other not knowing his business or having done something wrong; and the fault is certainly not always on the side of the contractor. The builders complain very strongly as to the injustice of having a dispute settled by the architect or (in the case of municipal work) by the borough surveyor, on the ground that this is putting the decision into the hands of a man who is really retained by one of the parties to the dispute. As far as concerns a salaried engineer or surveyor to a corporation, we quite agree. A professional man in such a position is no doubt a retained advocate; he is officially bound to satisfy his board or council, and may be dismissed if he does not. But an independent architect to a private client is not quite in the same position. The proper, the ideal position of a competent and high minded architect, is to be the natural arbitrator between the building-owner and the builder, and to see that neither gets any wrong; and so far from his being necessarily regarded as a retained upholder of the building-owner, we knew an actual case in which, in regard to a dispute, the client said to the architect: "Of course, you naturally lean to the side of the builder"; a soft impeachment which was denied. But the remark showed that the client did not regard the architect as counsel retained on his side; and we could certainly name not a few architects in whose fairness in settling a disputed point all builders would have confidence. Unfortunately, the high minded and clear headed architects (for the mere ability to see a thing rightly may be wanting in some) have to pay in reputation for the misdeeds or mistakes of the other kind; and builders who have been victimized by high handed and unfair treatment not unnaturally wish to safeguard themselves in future by a general recurrence to or threat of arbitration whenever there is a difference. We regret to know that there have been cases which went far to justify this attitude. But we may nevertheless remind them that the real position of the architect (where he is not holding a salaried office) is that of an arbitrator between client and builder; that an architect of the best type of ability and character is likely to be as impartial as any outside arbitrator, and knows much more about the work, and that such a man would regard the calling in of an outside arbitrator over his head as an undeserved insult, and would be justified in feeling it as such; and therefore the provision of arbitrators as a necessary condition of contracting ought not to be pushed too far, or regarded as a sine qua non. There are some architects who would resent it very much, whatever the institute form of contract may provide; to be sure, they are just the architects who would not be likely to afford any pretext for arbitration.

General

We may group into one paragraph some miscellaneous subjects of complaint on the part of the building trade. One of these is a very serious one; the frequent delay in the settlement of accounts. We have heard of this complaint often, and we have certainly known cases in which it has arisen from unreasonable delay on the part of the architect to certify accounts. That is acting most unfairly to the builder, who has in some instances been most seriously injured by it. The builders also complain of contractors being eliminated by corporations employing direct labor. That is a question of the public interest. If corporations believe that they can save public money by employing direct labor, they will be justified in doing it. As a general rule, however, experience has shown that direct labor has not resulted in a saving to the ratepayers; there are notorious instances in which it has resulted in very considerable loss; and therefore it is not a system to be encouraged. That, however, is the principle on which the question must be decided. In the case of public work, contractors have no right to claim that they should be employed because it is for their advantage. What they must do is to show that it is not to the public advantage; where they can do that they win their case.

The complaint that they should be made liable for the consequences of an outbreak of dry-rot in a building is a matter in which, as recent events have shown, builders are in the same boat with architects. It is now beginning to be recognized that dry-rot is a most insidious building disease which may get into a building without the fault of anyone concerned, and without any obvious reason. There are certain mistakes in construction which are favorable to it, which are even likely to cause it; and those mistakes have been more often the fault of the architect than of the builder, who only carries out the orders of the architect. We may suggest, however, that in cases where the builder's past experience has shown him that dry-rot would be likely to result from the construction employed, he would be doing right in calling the architect's attention to this, though we do not say that he is bound to do so. He cannot be considered legally responsible if he carries out the architect's orders, and no one ought to attempt to make him so.

The heavy liabilities which contractors lie under in respect of accidents to workmen in their employ, and which often bear most hardly and unfairly on them, are the result of legislation, some of which is very unwise, but which it is to be feared there is no chance of getting amended now. Liability for accidents to third parties, that is, to the general public, which has also been a subject of complaint, is only a matter of common law, and is in no way peculiar to building operations.

We have endeavored to consider this chapter of grievances from an entirely impartial point of view holding a brief neither for architects nor for builders, and sympathizing very strongly with the latter in regard to some of their complaints.

Method of Constructing and Waterproofing a Circular Reinforced Concrete Water Tank*

The city of New Ulm, Mich., has just completed a reinforced concrete reservoir of 1,000,000 gallons capacity, a cylindrical structure 75 feet in diameter with the walls 30 feet high, and covered with a conical concrete roof. The ground on which the reservoir is built consists of hard clay well drained by natural drainage, and upon this clay was spread a layer of stone with an average thickness of 12 inches, the voids of which were filled with a wet, fine grained concrete poured in. This formed the foundation for the floor, which is 10 inches thick, and reinforced near the surface with expanded metal of No. 16 gauge thickness and 3-inch mesh. The floor is bound to the walls by means of 1-inch round steel rods 8 feet long bent so as to extend 4 feet into the floor and 4 feet up into the walls. These were placed 12 inches apart throughout the circumference.

The walls are 20 inches thick at the bottom and taper to 15 inches at the top, with the batter on the outside. They are reinforced with 123 1⅛-inch and 40 1-inch round steel rods rolled to the required radius and placed horizontally, and by 20 upright supports made of steel angles with lacing bars, which served as supports for the horizontal rods during the time of construction, as well as vertical reinforcement in the walls. The horizontal reinforcement is sufficient to take all the stress without assuming tension in the concrete, or counting on the support of the earth embankment on the outside.

The roof consists of a conical concrete slab 3 inches thick and reinforced with No. 12 gauge, 3-inch mesh expanded metal, and is supported by eight trusses radiating to the wall from the centre pillar. The trusses are bound together with steel I-beams as purlins 5 feet apart. The steel trusses are 6 feet high from c. to c. of chords at the ends which rest on the centre pillar, and taper down to 3 feet at the ends resting on the walls.

Since it was of the utmost importance that the walls and the floor should be water-tight, special care was taken during the construction to grade the aggregate for the concrete. It has been found by experiments that the densest concrete can be made when rounded pebbles varying in size from about ¼-inch to about 2½ inches are used instead of broken stone on account of the ease with which such pebbles will move about in a quaking mixture while it is being worked in place, and adjust their positions so as to form the least amount of voids. For this reason pebbles were screened from a gravel bank and used instead of crushed stone for the walls and upper part of the floor, and the sand used was a mixture of very coarse and ordinary fine sand. To reduce the permeability of the concrete to a minimum, 20 pounds of hydrated lime was used to every barrel of cement, and after the forms were removed the walls were brushed and cleaned with steel brushes, and two coats of cement plastering were applied on the inside. The mortar for the plastering consisted of one part cement, two parts of sand, hydrated lime to the extent of 10 per cent. and Medusa waterproofing compound to the extent of 3 per cent. of the cement used.

The proportion used for the concrete in the walls and the upper 4 inches of the floor was 1 : 2 : 4 and this proportion of concrete together with the plastering has apparently made the walls water tight, as no leakage has been noticed up to this time except that a small leak in the bottom shortly after the reservoir was filled, which was due to an imperfect bond at one point between old and new concrete. This, however, did not cause serious trouble.

The forms for the walls were made in sections about 12 feet long by 2½ feet high, and the inside and outside parts were bound together by means of ½-inch rods extending through the walls, which were removed after the concrete had acquired its initial set. The holes formed by the rods were afterwards filled with a strong cement mortar. Only one round of forms was used, as the contractor found that he could work most economically filling the forms in one day and removing them the next, and set them up for the pouring of concrete again on the third day. When it was necessary to build scaffolding two days were taken to remove and set up the form and build scaffolds.

The bond between old and new concrete was made by brushing the old concrete thoroughly clean and pouring on a neat cement grout just before pouring on the new concrete.

There was a slight increase in the value of the Toronto building permits issued in July as compared with those in July last year. The following is the monthly report:

Jan. 1 to July 31	1909	1910
Value of buildings	$10,683,480	$11,793,883
Number of permits	2,952	3,738
New buildings erected	4,247	5,213
Month of July—		
Value of buildings	$1,854,105	$1,953,285
Permits issued	707	928

Stone-crushing Costs on the North River Tunnels*

The stone crushing plant played an important part in the economy of the concrete work on the New York North river tunnels. Trap rock excavated from the Weehhawken shaft was used. This plant consisted of a No. 6 and a No. 8 Austin crusher, driven by a steam engine of 120 h.p., and turned out about 225 cubic yards of stone per 10-hour day. The crushers and conveyors were driven from a countershaft. The cost of operating the one plant for 24 hours during concrete lining:

LABOR			
2 Engineers	$3.00	$6.00	
2 Firemen	2.50	5.00	
2 Pumpmen	3.00	6.00	
1 Foreman, Electrician	6.00	6.00	
1 Electrician	3.00	3.00	
1 Laborer	2.00	2.00	
Total, per day		$28.00	
Total, for 30 days			$ 840.00
SUPPLIES			
Coal, 14 tons per day	$3.15	$44.10	
Oil, 4 gallons per day	.50	2.00	
Water	....	13.00	
Other supplies	....	2.00	
Cost per day		$61.10	
Cost for 30 days			1,833.00
Labor and supplies for 30 days			$2,673.00

The process of crushing was as follows: The stone from the pile was loaded by hand into scale-boxes, which were lifted by two derricks into a chute above the No. 6 crusher. One derrick had a 34-foot mast and a 65-foot boom, worked by a Lidgerwood steam hoist; the other had a 23-foot mast and a 45-foot boom, and was operated by a General Electric hoist. All stone passed first through the No. 6 crusher, after which it was lifted by a bucket conveyor to a screen, placed about 65 feet higher than the stone bin. The screen was a steel chute, pierced by 2½-inch circular holes, set on a slope of about 45 degrees. The stone not passing the screen was led down to a No. 3 crusher. The cars in which the stone was removed could be run under the bin and filled by opening a sliding door in the bottom. A track was laid from the bin to connect with the contractor's surface railway in the Weehhawken shaft yard, and on this track the stone could be transported either to the Weehhawken shaft direct, for use on that side of the river, or to the wharf, where it could be dumped into scows for transportation to New York.

---

*From a paper by H. F. Bloomquist, City Engineer, New Ulm, Minn.

*From a paper by B. H. M. Hewett, and W. L. Brown in the Proceedings of the merican Society of Civil Engineers.

The cars used where 3-cubic-yard side-dump, with flap doors. They were hauled by dinkey locomotives.

The average force employed was:

1 foreman	$3.00
24 laborers, loading scale boxes for derrick	1.75
4 laborers, feeding crushers	1.75
2 laborers, watching screens to prevent clogging...	1.75
1 engineer, driving steam engine	4.00
2 engineers, on derricks	3.50
1 watchman, watching plant at night.	

The accidents to machinery, inseparable from a stone-crushing plant made it necessary to have three carpenters or machinists on the job continually. The approximate cost of the plant was:

Machinery	$5,850.00
Lumber	3,305.00
Labor	3,999.00
Total	$13,154.00

The cost of the crushed stone at Weehhawken amounted to about $0.91 per cubic yard, made up as follows:

Cost of stone	$0.22
Labor in operation of plant	0.31
Plant supplies	0.11
Plant depreiiation	0.27

It cost about eight cents to transfer a load across the river, and five cents from the dock to the shaft on the other side.

The Painting of Cement and Concrete Structures

In painting cement and concrete structures, failure to produce satisfactory results has, in most cases, been due to the painter's lack of knowledge of the oil destroying properties of the alkali in the cement and of the chemicals necessary for the neutralization of these alkalies. Mr. Chas. Macnichol, of Washington, D.C., in a paper read before the American Society for Testing Materials, describes a method of treating cement surfaces for painting, which he has now used for several years with success. The method consists in applying to the cement surface, a solution of zinc sulphate and water, mixed in equal parts by weight, and using an ordinary bristle brush. It is applied after the cement is dry. The wall is allowed from 48 to 72 hours for drying and is then, it is stated, as safe to paint as an ordinary plaster wall. The reason why some such treatment should be necessary before applying a paint coating to the surface of concrete is stated as follows: When Portland cement sets, a certain amount of lime is set free in a hydrated condition as calcium hydroxide. This being a strong alkali, tends to saponify the oil in the paint coating, and thus destroy it. The work done by the applications of the zinc sulphate is to destroy the alkalinity, and change the calcium hydroxide into a mixture of calcium sulphate and zinc oxide. Another point of advantage, and a very important one to the painter, is the filling of the pores of the concrete, thus saving a considerable amount of paint which would otherwise be wasted by penetrating too deeply into the wall

Third Annual Convention R.A.I.C.

The third annual assembly of the Royal Architectural Institute of Canada will be held at Winnipeg in the Assembly Hall of the University of Manitoba on August 25th, 26th and 27th. The headquarters of the members during the meeting will be the Royal Alexandra Hotel. Arrangements have been made with the Grand Trunk Railway for a single fare plus 25 cents as the price of a round trip ticket, providing fifty tickets are sold from points east of Port Arthur. Members should notify the secretary at the earliest opportunity of their invitation to attend. The tickets will be good going by Chicago and St. Paul and returning at any time within one month. The programme for the convention includes the following details:

On Thursday, August 25th, at 9.30 a.m., a meeting of council will be held. At 10.30 a.m. the inaugural session will take place, at which addresses of welcome will be delivered and the president, Mr. F. S. Baker, F.R.I.B.A., will reply. This will be followed by a business session which will include reports of various committees and officers.

At 2.30 p.m. another business session will be commenced at which the following subjects will be taken up: "Federation of the Various Canadian Architectural Bodies"; "Amendments to the Charter"; "The Architecture of the West," by J. Greenfield, M.A.A., F.R.A.I.C.; "Architectural Jurisprudence," by I. Campbell, K.C. At 8 p.m., a reception will be tendered by the president and council of the Manitoba Association of Architects.

On Friday morning, August 26th, a sight-seeing drive will be taken at 9.30 o'clock through Winnipeg and its suburbs. At 2.30 p.m. a business session will be held, of which the following is the programme: "Federation of Foreign Architectural Societies," by A. Chausse, L.R.I.B.A.; an address by Professor P. E. Nobbs, of McGill College; election of honorary and honorary corresponding members; general business; report on election of officers; discussion of next place of meeting; unfinished business. At 4.30 p.m. a meeting of council will be held and at 8 p.m. the annual dinner will take place at the Royal Alexandra Hotel.

On Saturday, August 27th, the members will accept an invitation from the Garson Quarries to inspect their large properties and partake of luncheon. A special train will be provided for this visit. The Winnipeg Builders' Exchange have also invited the members to be their guests in a visit to St. Andrew's Locks.

Notice of motion has been given by one of the members of the Institute tha tthe council be given power to obtain amendments to the charter of the Royal Architectural Institute of Canada, and to take the other steps necessary to alter the constitution of the Royal Architectural Institute, to comply with the request in the joint resolution of all the official provincial associations throughout Canada, to form the R.A.I.C. into a federation of official Canadian architectural bodies. Among the principal amendments will be the changing of the name of the "Royal Architectural Institute of Canada" to the "Royal Institute of Canadian Architects," and providing a class of membership for those members of the Royal Architectural Institute, who are not members of a provincial association, such as for instance "non-registered members."

The local committee of arrangements consists of Messrs. J. H. G. Russell, M.A.A., F.R.A.I.C.; S. Frank Peters, M.A.A., F.T.A.I.C.; S. Hooper, M.A.A., F.R.A.I.C., and W. Percy Over, M.A.A.

Mr. Norton Griffiths, an English member of Parliament will shortly make an extensive tour through Canada. Mr. Norton Griffiths is one of the most prominent engineers and contractors in England and his firm have the contract for the construction of the Chilean Andean Railway, involving the expenditure of some $20,000,000

Economy of Good Stone on Macadam Roads

Interesting Observations of an Irish Road Surveyor—Adaptability of Hard Stone of Uniform Quality—Methods of Keeping Down Cost

There are many varieties of rocks, and each has different qualities varying with the mode of occurrence, the mineral character, the stratigraphical position, and the weathering of the stone.

The quality of a stone used in the surface of a road should be suited to the traffic it is subjected to, i.e., a hard and tough stone should be used on a road over which heavy traffic is carried continuously; for light traffic, a comparatively soft stone, i.e., one of a different mineral character, will generally prove sufficient. If, however, a hard stone abounds in the vicinity of a road it should be used, whether the traffic is heavy or light, i.e., a soft stone should not be brought from a distance to a road subjected to light traffic, for it may thus become as dear as the hard stone, and, apart from the influence of the traffic upon it, will not wear as well or last as long.

The converse of the last statement, however, contains a greater truth—in other words, to a road on which the traffic is heavy, hard stone, though it cost much more when delivered than soft stone, which may occur in the vicinity, should be brought—for it will be found that the greater cost is more apparent that real. In other words, if the period of time through which the stone survives, and the labor expended in cleaning and repairing it are taken into account, it will be found the hard stone is generally, in the end, the cheaper.

The hard stone, however, should be uniform in quality, and (for light traffic) broken to a smaller gauge—say 1½-inch. The temptation to mix stones of different qualities and to send out the metal too large becomes greater, the harder the rock to be broken.

These two faults have sometimes given a bad name to a quarry which contained excellent road material. In Dublin county soft and hard stone are found, the former being, mostly, the carboniferous limestone, which is the formation exposed, generally, over the greater part of the county, as over the whole central plain of Ireland, and containing beds of variable qualities—the latter igneous intrusions through the Silurian slates commonly known as "greenstone," and metamorphic beds of lower Silurian age, the most serviceable of which, for road purposes, is known as "quartzite."

Other metamorphosed rocks, such as gneiss, schists, etc., and plutonic rocks, laid bare by denudation, such as granite, are exposed abundantly, but most of them, being friable or easily disintegrated, are almost useless for road purposes.

Unfortunately, the limestone occurs on the north side of the country, which is chiefly agricultural, and where the traffic, the products of agriculture inwards and manure or goods outwards, is heaviest.

For many years most of the main roads in this area have been repaired with limestone from the hardest or crystalline beds, but the experience gained during that period of time has shown the writer that it would be foolish to prolong the experiment, and the sooner a hard stone is brought to these roads the better for them and the users of them.

Take the road between Drumcondra and Santry. This forms portion of the principal highway from Dublin to the north, via Balbriggan and Drogheda, and is the route taken for the carriage into the Dublin markets of the agricultural produce of the northern area of the county as far as Gormanstown.

On the section described, which is the nearest to the city, and on which a tally kept on one occasion showed 115 loads to have passed a given point in three hours, equivalent to about 75 tons per hour, carried on 2½-inch tires (or 8 cwt. per inch of width of tire), limestone from the best beds in Pass quarry, broken to pass a 2½-inch and to be rejected by a 1½-inch ring, has been rolled for the past five years.

At first it was found difficult to get the stone broken properly, though by hand, and the failure of the road to retain an even surface was at first ascribed to irregular breaking. During the past two years this has been improved, with the result that the surface did not become so pitted and bumpy as before.

Under the heavy traffic, however, the excessive wear continued, but more uniformly than before, the disintegrated surface, as thick and greasy mud in wet, and dust in dry, weather, not only causing, while it remained, great dissatisfaction to the public, but great expense in its removal.

The section of the road under consideration is 526 statute perches in length, has an average width of 6 yards, and has cost £500 a year, or nearly £1 a perch, to maintain.

About 1,200 cubic yards of limestone have been rolled in on about three-fourths of the length each year, and two surfacemen are kept constantly at work on it cleaning and patching it.

From the last statement it follows the road is rolled throughout three times in four years. It must be admitted this is excessive, and the cost of maintaining this road is absurdly high. The fault is in the material used, and its use, dictated latterly by the desire to give employment in the district, has been continued too long.

On the writer's application for the current year, a sum of £600 has been allowed for the road, and he has decided to discontinue the use of limestone, substituting 850 cubic yards of broken quartzite from Howth, and 200 cubic yards of quartzite screenings, these costing on the road 7s. 6d. per cubic yard, against 5s. 6d. paid previously for limestone.

It is estimated the quartzite will last three times as long as the limestone, and will require about one-fourth only of the labor in cleaning. There should, therefore, result in the use of this stone on the road a saving of about 60 per cent. after three years, when the whole road will have rolled with the quartzite, if the above assumptions are correct. To the users of the road, too, there will be a distinct gain in the use of the better material, requiring, as it will, to be rolled less often, and causing, therefore, less interruption to the traffic. Add to this, there will be less mud and dust, and, therefore, greater comfort to the public.

The trouble which recently occurred at St. John, N.B., in connection with the laying of pavement on a portion of Main street, has led to the resignation of Inspector James Carleton, who declares that the foundation being laid is 50 per cent. cheaper than the specifications call for. The chief engineer states that the foundation is satisfactory to him and that he has final authority over specifications. A special meeting will be called by the mayor to discuss the whole matter.

Mr. J. R. Cosgrove and Mr. H. Macpherson, the newly appointed engineer and assistant respectively for North Vancouver, B.C., have accepted their appointments.

---

*From a paper by Wm. Collen, Surveyor of Dublin County, before the Irish Road Congress.

Rules for the Measurement of Slate and Tile Roofing

Differences of opinion are constantly arising in the trade as to the proper manner of measuring slate and tile roofing, and the following customary rules therefor as codified and revised by the Standard System of Measurement in London, England, cannot fail to prove interesting to roofers in this country:

Slating—Net area, after deducting all openings containing four feet superficial or over.

Mansard, vertical, dormer, cheeks, small surfaces under 10 feet superficial, circular, conical, octagonal or turret roofs to be measured separately.

Eaves—A lineal measurement to be taken to the equivalent of 12 inches deep.

If irregular or cut to follow drips of gutters, an extra measurement of 6 inches to be taken.

In the case of all random slating add a further 6 inches.

If bedded or pointed, to be charged separately.

Verges—A lineal measurement equivalent to 6 inches wide to be taken at all square verges and secret gutters.

If slate and a half or special wide slates are used, add a further 12 inches.

Top Edge—A lineal measurement equivalent to 6 inches deep to be taken on either side of ridges, under sills of dormers, lanterns, skylights and any openings where top course slates are used.

Square Abutments—A lineal measurement equivalent to 6 inches wide to be taken where slating adjoins sides of all chimney stacks, dormers, skylights, and other openings; also at one end of slope where slating finishes between parapet or party walls.

Circular Cutting—A lineal measurement equivalent to 12 inches wide to be taken.

Raking Cutting—A lineal measurement equivalent to 6 inches wide to be taken at all rakes.

Valleys—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all valleys.

If special wide slates or slate and a half are used, take an additional 12 inches on both sides.

Hips and Angles—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all hips and angles.

If special wide slates or slate and a half wide are used, take an additional 12 inches on both sides.

Mitre Cutting—A lineal measurement to be taken for all mitres (in addition to the usual cutting), whether at hips, valleys, or other places where slates are close cut; to include all necessary oil cement.

Ridge and Hip Coverings—A lineal measurement of all ridges and hips, including setting and pointing in cement.

All splays, cut ends, mitres, intersections and top ends to be numbered and taken separately.

Tiling

Tiling—Net area, after deducting all openings containing 4 feet superficial or over.

Mansards, vertical, dormer, cheeks, small surfaces under 10 feet superficial, circular, conical, octagonal or turret roofs to be measured separately.

Eaves—A lineal measurement equivalent to 8 inches deep.

If irregular or cut to follow drips of gutters, an extra measurement of 6 inches to be taken.

If bedded or pointed, to be charged separately.

Verges—A lineal measurement equivalent to 6 inches wide to be taken at all square verges and secret gutters.

If on rake, take an additional 6 inches.

Top Edge—A lineal measurement equivalent to 6 inches deep to be taken on either side of ridges, under sills of dormers, lanterns, skylights and any openings where top courses are used.

Square Abutments—A lineal measurement equivalent to 6 inches wide to be taken where tiling adjoins sides of all chimney stacks, dormers, skylights and other openings; also at one end of slope where tiling finishes between parapet or party walls.

Circular Cutting—A lineal measurement equivalent to 12 inches wide to be taken.

Raking Cutting—A lineal measurement equivalent to 6 inches wide to be taken at all rakes.

Valleys—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all valleys, including all necessary tile and a half.

Bedding and pointing to open valleys to be charged separately.

Valley tiles to be measured extra only, over the usual measurements on both sides.

Hips and Angles—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all hips and angles to include all necessary tile and a half.

Hip and angle tiles to be measured extra only, over the usual measurements on both sides.

Mitre Cutting—A lineal measurement to be taken for all mitres (in addition to the usual cutting), whether at hips, valleys or other places where tiles are close cut, to include all necessary tile and a half.

Ridge and Hip Coverings—A lineal measurement of all ridges and hips, including setting and pointing in cement.

All splays, cut ends, mitres, intersections and top ends to be numbered and taken separately.

Cost of Mixing and Placing Concrete by Hand

The work on a 4-foot circular sewer in Louisville, Ky., was carried on entirely by hand. The sewer was located through a park and near a roadway and materials for the work were placed at convenient points. The invert contained 0.21 cubic yards of concrete and the arch 0.18 cubic yards per lineal foot, and each was built separately. A light mixing board was made, and was shifted along by the gang as the work progressed.

The gang consisted of 17 negroes and a foreman, whose duties consisted of excavation and concreting for the sewer. The successive steps of their work were alternated with another gang which attended to the forms and reinforcement. The length of concrete laid at one operation was 72 feet of either arch or invert and the time required to do the work averaged 3¼ hours. The men were diveded as follows:

2 men on mortar.
4 men on gravel.
2 men on sand.
4 men on mixing board.
1 man on water and cement.
4 men in trench spading.
1 foreman.

Al lthe men received 20 cents per hour and the foreman received 35 cents per hour. The cost of concreting 72 feet of invert or arch was thus:

17 men at 20 cents per hour, 3¼ hours	$11.05
1 foreman at 35 cents per hour, 3¼ hours	1.14
Cost of laying 72 feet of invert or arch	$12.19

This gives for 72 feet of complete sewer a cost of $24.38, which divided by 28.08 cubic yards, gives a cost of 87 cents per cubic yard. In this work there were about 2.23 pounds of steel reinforcement per lineal foot of sewer. Two men were employed continually to bend the steel and place it in position in the forms.—Engineering-Contractor.

Hon. Mr. Brodeur and Hon. Dr. Pugsley are making an inspection trip of harbors and rivers on the Great Lakes with a view to ascertaining what further improvements are needed.

Notes on the Failure of Stucco Work

Selection of Material, Mixing and Application — Unsightly Work Attributable Largely to Lack of Proper Ingredients—Remedial Measures

A number of years ago stucco was quite generally used in certain localities, but owing to failures of the material to withstand the action of the elements and to other causes, this type of construction was almost entirely abandoned. During the last few years, however, there has been a very marked tendency by the building public to take up this class of construction again, therefore this word of caution.

We do not want to have the same experience with this type of construction, as the concrete block industry has had, and yet unless due care is used in drawing specifications and in their application, there are going to be a great many failures as in the past. Our architectural friends are very partial to stucco exterior, and if it is properly mixed and applied will come up to their expectations in every way. So much depends on the selection of the material, proper mixing and proper application that only skilled mechanics who are familiar with this class of work should be employed.

The writer has had opportunities to inspect a great many stucco residences in the past few years and is very sorry to say that the greater percentage of them are unsightly, due to cracks, discolorations caused by improper application, and lack of proper ingredients, etc. I wish to illustrate briefly by stating facts regarding two or three of the houses that have come to my attention.

I remember one residence in particular, where there were a great many horizontal cracks in the stucco running almost the entire length of one side of the building. These cracks were about two feet apart and were very pronounced. The whole area of sides and ends was very unsightly. After a very careful investigation it was found that in nearly every instance where cracks had developed that they were at a point where the wire lath was lapped and in many places less than ¼-inch thickness of stucco was over these laps. In some instances by cutting out the cracks it was found that the metal lath was not even tacked solidly in place, and yet stucco work in general was condemned by a number of parties on the results obtained on this one building. It was quite apparent that the trouble was not due to any fault of the material, but in this particular instance was due entirely to the application of the wire lath and stucco. In addition to the large cracks at the laps of the wire lath, there were a number of hair cracks throughout the entire area, which apparently were caused by too much trowelling of the concrete mass, and as was found by investigation there was a coating or frosting of Portland cement on some of the areas and the cracks penetrated just through this frosting. Other areas were entirely smooth and cracks had not developed.

In another case regular lime mortar plaster without any Portland cement was used for the scratch coat. The second and finishing coat consisted of a poor mixture of Portland cement and sand. The finish coat was only about ¼-inch thick. Moisture penetrated through the finish coat and the mortar composing the scratch coat being subjected to contained moisture, disintegrated and the stucco came off in sheets.

The third case was very similar to the second, although wood lath was used instead of wire lath on a small building near the seashore. The scratch coat material consisted of regular interior plaster and the second coat consisted of Portland cement, asbestos rock and asbestos fibre. The second coat was very thin and the damp salt air and moisture penetrated through to the first coat. The lath became swelled and the stucco came off in sheets. The stucco on this work was condemned and the faults were laid at the door of the asbestos and Portland cement. Upon investigating the matter thoroughly, it was readily proven that the entire trouble was due to the nature of the lath and the materials entering into the first coat.

I have referred to these buildings with a view to cautioning people interested in stucco construction to see that this particular part of the building is given proper attention. In the past stucco has been applied in two coats, the total thickness being about ½-inch to ⅝-inch. Past experience is teaching us, however, that 1-inch is by far better and if the material is applied in this thickness, house owners and architects should not have reason to regret its use.

Another point of considerable importance is the color. A uniform color is rather difficult to obtain, on smooth surfaces particularly, but it can be obtained if proper attention is given to the selection and mixing of the ingredients and if the stucco is properly applied. When Portland cement and sand are used it is very essential that the sand should be absolutely free from any organic materials which have a tendency to discolor. It is also of vast importance that the ingredients be mixed very accurately and carefully and that a sufficient amount be mixed at one time to cover certain areas exposed to the same lights and shadows.

For example, the work should not be left in an uncompleted condition half way between windows or half way down the side walls, for just as certain as this is done, there will be a streak showing where the later work was started. If it is necessary to do a certain given area at two operations, care should be used to get the materials properly blended and the new stucco floated or trowelled to correspond exactly to that already done. By using a little care on details of this kind the ultimate results will be much more satisfactory.

Portland cement and sand as a stucco mixture has been used with fair success where work has been carefully supervised, but there has been such a lack of proper attention to the mixing and application that there have been some very bad failures. The use of asbestos rock and fibre to take the place of sand is meeting with considerable success. The asbestos fibres have a tendency to hold the water which is used to mix the concrete mass, longer, thus giving the Portland cement ample opportunity to become properly set and in this way stucco mixtures are possible that are more uniform in color and less liable to crack as the fibre also furnishes additional bond.

There is one point which is frequently lost sight of, that is that it is possible to manufacture or make concrete slabs that are free from cracks and that can be exposed to the elements for an indefinite period without discoloration. Therefore, should cracks develop in a well constructed stucco work it can be invariably traced to settling of the building or the shrinking of the frame. By insisting upon thicker stucco walls the liability of the stucco cracking is reduced to a minimum.

The price of lumber is readily advancing and the desire for fireproof exteriors, especially in the suburban districts as well as artistic effects that may be obtained from stucco are creating a universal demand for this type of construction, and while the initial cost may be slightly more it is such a small part of the total outlay and such an important part of the structure that the best is the cheapest in the end.—Engineering-Contracting.

St. Andrew's Dam, Red River

At St. Andrew's rapids on the Red river, at a point about 15 miles below Winnipeg, a "Curtain" dam and lock have just been completed by the Public Works Department of the Dominion Government, thus making the Red river navigable from Lake Winnipeg to Winnipeg. The dam also furnishes a means for maintaining the level of the Red river at Winnipeg uniform.

This dam is operated entirely by motors and is the first one of its kind to be built on the American continent.

The dam consists of five piers and two abutments supporting a superstructure of six spans. (See fig. 1). From the underside of the superstructure hinged frames are suspended, and are let down in the spring and raised in the autumn when navigation is over. Fig. 2 shows one of the cranes by means of which the raising and lowering of the frames is accomplished. This crane is operated by two motors, one a 10 h.p., 220-volt crane motor, which raises and lowers the frames, and the other a 2 h.p. motor used to move the crane along the floor of the superstructure.

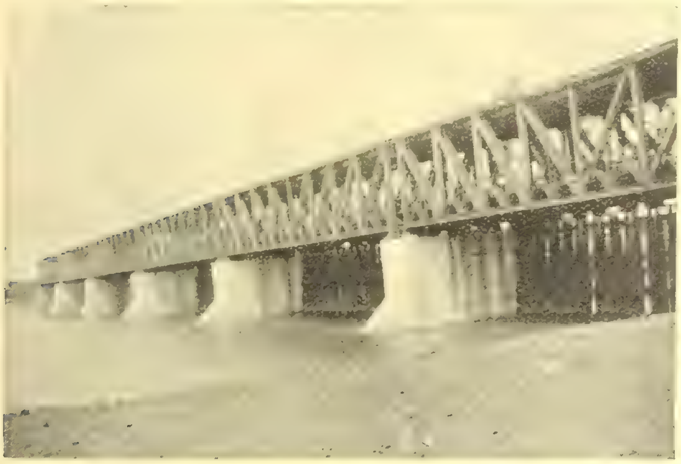


Fig. 1—St. Andrew's Dam at Red River Up Stream Side

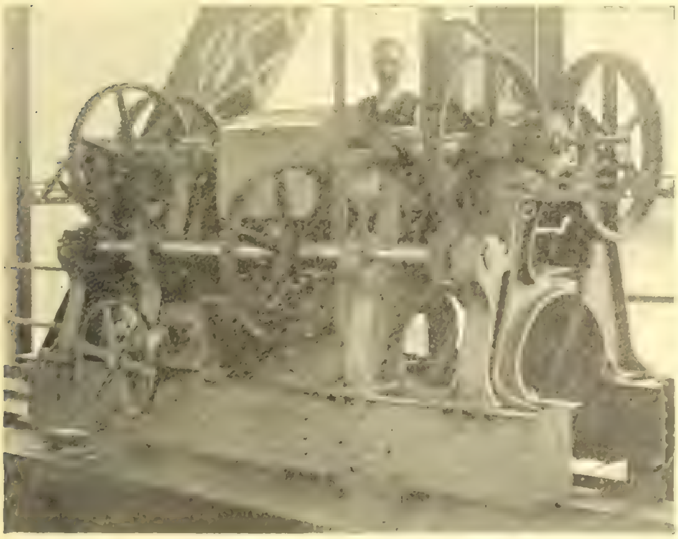


Fig. 2 St. Andrew's Dam Frame Cranes Electrically Operated

The level of the water is controlled by "curtains," consisting of a number of wooden battens so connected together and placed on the frames as to be capable of being rolled up or down when the level of the water is to be lowered or raised. These curtains are rolled up or let down by curtains or cranes of the type shown in fig. 3. The curtain cranes work on a platform supported on the down-stream side of the frames when they are in their lowered position, and they can be run from end to end of the dam, passing through the opening shown in the piers in fig. 4, to the point when the curtain is to be adjusted.

The power for operating the motors and lighting the dam and canal is derived from a steam plant on the east bank of the river, in which there is a 40 k.w., 250-volt direct current, engine-driven generator. A motor-generator of the same capacity has also been installed to take alternating current from the Winnipeg Electric Railway Company, and generate direct current for a "break-down" service. The electrical equipment was furnished by the Canadian General Electric Company, and the construction of the dam was carried out under the supervision of Mr. A. R. Dufresne, until recently district engineer of the Department of Public Works.

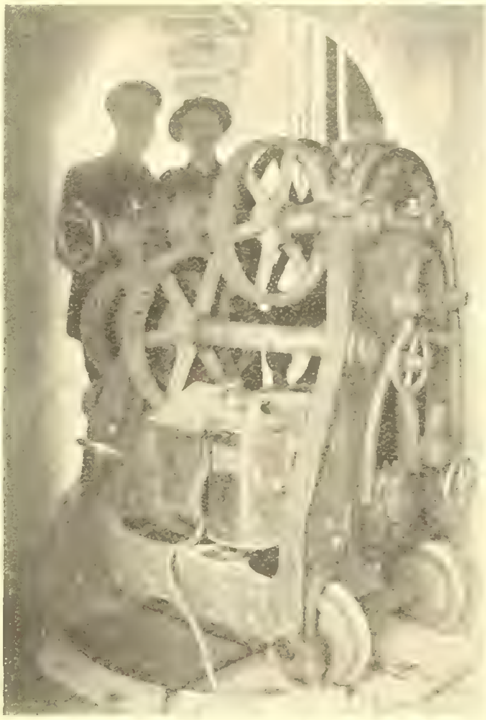


Fig. 3 St. Andrew's Dam One of the Curtain Cranes

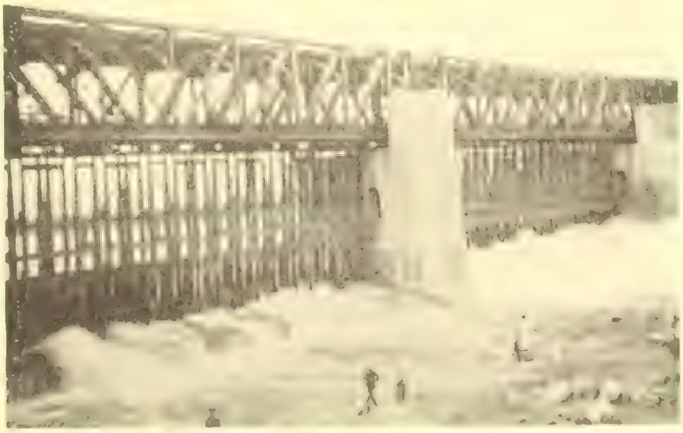


Fig. 4 St. Andrew's Dam Down Stream Side. Lower Gallery and Curtains in Place. Note Opening in Pier

Trade News from Montreal

Unlimited Activity in Building Circles—The Builders' Exchange and Trades Unionism—Business News and Notes

Montreal Office of the "Contract Record."
August 8th, 1910.

Nothing of particular interest has transpired during the past week in connection with the local strike of the masons and bricklayers. The Builders' Exchange has placed itself on record as not being opposed to rational unionism, responsible for its engagements and amenable to the laws of Canada. In pursuance of its avowed policy of "Canada for the Canadians" the executive and the master masons and bricklayers section have opened negotiations with the Canadian Federation of Labor, to establish branches in Montreal covering these lines, and eventually all other lines of the building trades. The Canadian Federation has already a bricklayers' union in Ottawa, and has expressed itself as being entirely in sympathy with the attitude maintained by the Builders' Exchange, viz.:

1. To admit only competent men to its membership and thus to justify the recognition of a minimum wage scale.
2. To work in harmony with the employers through a joint arbitration board.
3. Not to discriminate against "open shop" or to enter into sympathetic strikes with trades other than that under agreement.

Work generally is proceeding at a good rate and from the outlying districts good reports are received which show unlimited activity in building circles.

Sprinkler Tank Inspection

At Inspector Chausse's office information was obtained as follows, concerning the inspection of sprinkler tanks throughout the city: In Montreal there are 127 sprinkler system tanks. Up to date, satisfactory reports have been received covering inspections of 56 of these; 5 inspections are not completed; 13 letters more have been received stating that the owners will have inspections made at once; while there are 53 owners of tanks who have not replied to the Building Inspector's intimation regarding inspection.

Windsor Station Contracts.

What constitutes probably the plum of this year's building work, namely, the contract for the erection of the new Windsor street station for the Canadian Pacific Railway Company, fell to Mr. C. E. Deakin, the well known general contractor. It is, moreover, rumored that the contract was secured on a percentage basis. The entire superstructure of this building when completed will probably cost in the neighborhood of $1,500,000. Mr. Deakin gets the masonry and general contract, while the Dominion Bridge Company was awarded the contract for erection of the skeleton steel frame. It is expected that this new building will be completed by November, 1911.

Review of Building Situation

Figures just to hand from Building Inspector Chausse's office covering operations up to the end of July more than justify the earlier predictions expressed concerning the showing that would be made in this period. While in the actual numbers of permits issued there was a slight falling off as compared with July of the previous year, in point of value they are almost five times as great, having reached a total of $3,385,360; an excess of $2,673,224 over July, 1909.

For the first seven months of the year the summary also shows to advantage, there being an increase of almost $4,700,000 as compared with this same period in 1909. Already this year permits aggregating in value $9,522,240 have been issued, while during the whole of last season the total only reached $7,777,621. It must not be forgotten, of course, that at the Montreal office permits are issued for the former town of Ville St. Louis and other newly annexed wards. Yet even allowing amply for the influx from these directions, we are undoubtedly enjoying a splendid year in building circles and with a continuation throughout the remaining five months this will prove a banner year.

The detailed figures to date are as follows:

July, 1910	Permits	Value
New buildings	178	$3,182,408
Alterations	67	202,952
July, 1909—		
New buildings	181	562,156
Alterations	76	149,970

Total increase of July, 1910, over July, 1909, $2,673,224.

Jan. 1st to July 31st, 1910—	Permits	Value
New buildings	1,534	$8,783,945
Alterations	544	808,295
Jan. 1st to July 31st, 1909—		
New buildings	966	$4,257,457
Alterations	507	640,834

Increase 1910, $4,693,949.

Memorial Tower Completion

The results of the competition held under the auspices of the Royal Architectural Institute of Canada for plans for a memorial tower at Halifax, to commemorate the establishment of legislative government in Canada, have just been announced. In all, twelve designs were received by the judges, Messrs. F. S. Baker and Frank Darling, Toronto, and Prof. Percy Nobbs, McGill University, Montreal. Mr. A. Sharp, Toronto, submitted the winning plans. Mr. W. W. Brown, Halifax, was awarded second prize, and John M. Lyle, Toronto, third prize.

Important Construction on St. James street

The work of demolishing the St. Lawrence Hall block to make room for the big Dominion Express Building is progressing satisfactorily. Messrs. Peter Lyall & Snos, Limited, are the contractors and this firm are also engaged in removing the walls of the structure occupying the site of the new Yorkshire Insurance Building. These two structures are situated opposite to each other on St. James and St. Francois Xavier streets and next year this same company will commence the erection of another large building on another corner of these streets, namely the Transportation Building, which is to be the largest office building in Canada. The construction of these three large buildings at the same time should be very convenient for the contractors and should also transform this section of St. James street into a busy thoroughfare.

Reinforced Concrete Construction

Mr. G. B. Reynolds, Montreal and district engineer and sales agent for the Trussed Concrete Steel Company of Canada, Limited, has recently closed the following contracts: Kellert Building, Montreal, Messrs. Hutchison Wood & Miller, architects, Messrs. Peter Lyall & Sons, Limited, general contractors; Rosenthal Building, Ottawa, Messrs. Weeks & Keefer, architects, Mr. C. E. Deakin, general contractor. The complete structural portions of these two buildings, including floors, beams, columns, etc., to be constructed according to the Kahn system. Diamond White Wear Company at Three Rivers, Messrs. T. Pringle & Son, Limited, architects; Mr. C. E. Deakin, general contractor; Hy Rib metal to be used in construction.

Personal

Mr. A. D. Dame, sales manager of the Expanded Metal & Fireproofing Company, Toronto, spent several days in Montreal last week. During his visit Mr. Dame was in consultation with Mr. J. E. MacDougal, who has charge of the firm's interests in this district.

Mr. J. F. Jago was in Ottawa recently in connection with his contract for the construction of the reinforced concrete portion of the new Rosenthal Building. We understand that this work has been placed under way and will be rushed along during the remainder of the season.

Notes

At a recent meeting of the Maisonneuve council Messrs. Vickers' Sons & Maxim were granted a twenty years exemption from taxation for their proposed floating dry dock and ship yards which are to be located at Molson's creek. The works will cover 25 acres of the river front on property owned by the Montreal Harbor Commissioners.

Superintendent Janin, of the Waterworks Department, estimates the cost of providing the newly annexed districts with an improved an up-to-date water service at $250,000. The Board of Control will thoroughly study this question of water supply before taking action.

The civic authorities are taking an active interest in the approaching Eucharistic Congress to be held in Montreal during September, and will assist the committee by erecting extensive decorations along the procession route.

The sum of $40,000 is being spent by the city executive in the work of effecting improvements throughout the city parks and squares, the amount being distributed principally amongst the larger breathing spaces of the city. In Mount Royal Park the sum of $8,400 is required, whilst in Lafontaine Park $4,500 will be utilized.

The Dominion Mosatile Flooring Company, Limited, has been incorporated with a capital of $100,000; headquarters, Montreal. The incorporators are J. S. Dupont, A. Bourque, T. Daoust, P. St. Pierre and Chas. Lebel.

The Westmount City Council have passed upon a park extension by-law, which scheme includes the laying out of the Gordon and Holt property on the top of the mountain for residential purposes and involves a considerable expenditure.

A Timely Illustration

The Twin City Automobile Club and their friends from Fort William and Port Arthur were the guests of Mr. James Murphy, president of the club, at a banquet which was recently held at Stanley. The members of the club journeyed to the scene of the entertainment in automobiles. The after dinner speeches consisted almost entirely of addresses upon the subject of good roads and much enthusiasm for the cause was displayed. Upon the return trip a rather humorous situation developed. During the banquet the rain fell in torrents and the guests had not proceeded far on their homeward journey before they began to experience serious trouble on the highway. Some of the drivers managed to get through to their destination early in the morning, but many of them were unable to reach town until daybreak the next day. A sea of mud and slush had to be navigated and when the autos reached town they were in a terrible state. The occupants were more enthusiastic than ever upon the necessity for improving the county roads.

The good roads convention which was held at Winnipeg recently was most successful. A number of extremely practical addresses were delivered by various authorities and enthusiasts and at the conclusion of the meeting the following resolutions were adopted:

"That the thanks of the association be tendered to the government for the appointment of Mr. Archibald McGillivray as highway commissioner.

"That a convention be held annually.

"That the government be requested to introduce at the next session of the legislature, legislation to enable municipalities to finance and construct a system of good roads."

Victor Mager moved that the government be asked to take over the construction of roads throughout the province. It was decided to leave this over for the next meeting of the association.

Plumber's Interesting Discovery

The Toronto Star in a recent editorial has the following to say under the heading of "faulty construction": "From time to time the press has sounded an alarm with regard to hastily constructed homes. It has been pointed out that Toronto builders have been guilty of 'rushing up' their houses, installing flimsy floors and 'skimping' their work in many ways. The result is seen in residences only a few years old, where the plaster is falling from the walls, the woodwork shrinking and out of shape, the roofs leaking and the floors becoming uneven. Because the City Architect's department has no right to interfere so long as the foundation and walls are strong, these matters would be difficult of regulation, even had the already overworked staff of inspectors the leisure to attend to them.

"Plumbing, however, involves the public health, and there seems to be no reason why the requirements with regard to it should not be enforced. The 'Plumber and Steamfitter' believes that they are not, and cites the following instance:

"'A man rented a house and store on Royce avenue. He happened to be a plumber, and on taking possession naturally took a look at the plumbing in his new home. Here is what he found: The hot water pipe from the top of the range boiler was left hanging in the partition, while the pipe from the hot water tap in the sink was connected to the cold water tap in the adjoining house. The cold water pipe connected with the tap in the sink was found with an open tee in the partition behind the baseboard. All bathroom fixtures leaked owing to loose couplings. The gas pipe was not carried to the meter, being left hidden in the partition.'

"He may consider himself lucky that his gas meter was not connected with the water pipes. He was fortunate in being a renter and not a buyer. Toronto's rapid expansion is a source of civic pride, but it brings with it the temptation to build hastily rather than well."

Mr. Herbert Johnston, the newly appointed town engineer of Berlin, Ont., was born at Meaford, Ont. He graduated in Civil Engineering from the Faculty of Applied Science of Toronto University in 1903. He became an Ontario Land Surveyor in 1905. In 1908, he was admitted as an associate member of the Canadian Society of Civil Engineers.

His first practical experience was with John Rodgers, Esq., O.L.S., Mitchell, Ont., where he spent two years in drainage engineering. In 1903 he entered the employ of Wm. Mahlon Davis, C.E., Berlin, and in 1905, he formed a partnership with Mr. Davis with the firm name of Davis & Johnston. During the last five years the firm have been employed in many engineering works, the most important of which are as follows: Galt sewerage system; Listowel, Preston, Hespeler and Wingham waterworks; Berlin sewage disposal works; Waterloo sewage disposal works and Guelph water supply. On July 1st, Mr. Davis left Berlin to assume the duties of city engineer of Prince Rupert, B.C., and Mr. Johnston was appointed town engineer of Berlin.

A special committee recently appointed by the Winnipeg General Hospital has presented a report recommending that the hospital be placed under municipal control so far as expenditures are concerned and that at the same time it be continued as a voluntary institution, and life governors share with the city in the direction of its affairs. The city is urged to proceed without delay with the erection of new tubercular and isolation hospitals. Improvements are proposed for the outdoor department. The committee state that they do not believe there is any general desire for the construction of a municipal hospital. They urge also that a by-law for the expenditure of $400,000 for hospital purposes shall be submitted at the next municipal elections.

Good Roads in the Maritime Provinces

The Moncton, N.B., Board of Trade has instructed its delegates of the Maritime Board meeting at Chatham to present a resolution in favor of the provincial governments of the Maritime Provinces taking steps to provide provincial roads between the main centres of the provinces in order that such roads may be made both uniform and permanent. It is recommended that these roads be withdrawn entirely from the operation of the ordinary highway Acts and placed under the control of experts by each province. Another resolution refers to municipal bonded indebtedness. In view of the situation created by the Campbellton fire, the recommendation is made that all future issues of municipal bonds, town, city or county, under authority of the local legislatures, shall be guaranteed by the provincial governments both as to principal and interest. A guarantee fund is suggested, to be provided by each province from the proceeds of the sale of such bonds to meet extraordinary emergencies similar to that resulting from the Campbellton fire.

City Architect Nutter and the Plumbers' Union

City Architect Nutter, of London, Ont., at the suggestion of the city council, has presented a report upon the request of the Plumbers' Union for the appointment of a plumbing inspector. Mr. Nutter went into the question very fully and among other things made the following recommendations:

1. The repeal of the existing by-law and the preparation of a new by-law in keeping with the city's needs and in line with the modern practice of other cities.
2. The formation of an examining board of plumbers to consist of three members, viz., the building inspector, the city engineer and a master plumber of not less than ten years' experience.
3. The examination and registration of all master plumbers and journeymen and the issuing of an annual license and a certificate to all qualifying. It is suggested that the examining fee be $1 and the registration fee as follows: For master plumbers, $10; journeymen, $5; annual licenses, for master plumbers, $5; and journeymen, $2.
4. The filing of plans and the issuing of permits for all alterations to existing plumbing and new work. The testing of all work to be made compulsory and a fee of $1 charged for each examination.
5. The appointment of an assistant building inspector to act as plumbing inspector and to assist in the inspection of buildings generally.

The matter was allowed to stand temporarily without any decision being reached by the special committee which had to deal with it.

An Interesting Announcement

Eadie-Douglas, Limited, who are now located in their new premises at 12-14 University street, Montreal, announce the opening of their mechanical and steam department under the management of Mr. G. M. Milligan (late with Manning, Maxwell & Moore, New York). This deparmtent will be devoted exclusively to the highest grades of mechanical and steam specialties and supplies and the firm through their connections are able to quote on complete specifications. Among the well known companies represented by the firm in the mechanical and steam specialty line are the following: B. F. Sturtevant Company, manufacturers of fans, blowers, heating and ventilating sets, etc.; Shaw Electric Crane Company; the Platt Iron Works Company, manufacturers of Smith-Vaile pumping machinery, condensers, etc.; Lenher Engineering Company, manufacturers of Taylor gravity underfeed stokers; Direct Separator Company, manufacturers of Sweet's steam and oil separators, exhaust heads, etc.; James Beggs & Company, manufacturers of Blackburn-Smith oil filter and grease extractor; Frank L. Patterson & Company, manufacturers of Berriman feed-water heaters, etc.; the Linton Machine Company, manufacturers of combination feed-water heaters; and Alphons Custodis Chimney Construction Company, manufacturers of radial brick and concrete machinery. Among the other important lines which Eadie-Douglas handle are valves, boiler trimmings, engine room accessories, insulating specialties, etc. The branch offices of the firm are at 65 Victoria street, Toronto; 445 Main street, Winnipeg, and 81 Band street, Ottawa.

The city council of Winnipeg have decided to consider the immediate construction of a municipal gas plant. City Engineer Ruttan has been instructed to submit plans as soon as possible. This step has been taken by the city on account of the trouble which has arisen with the street railway company, which has refused to supply a number of houses with gas unless given permission to erect a gas plant on Ida avenue.

The picnic of the London Builders' Exchange at Port Stanley, Ont., was a most enjoyable affair. About 2,000 people who are associated with the building trades of London went to the Port and a few thousand more joined in the entertainment. Ex-Ald. Donald Ferguson, who was chairman of the committee of arrangements, had much to do with the skilful carrying out of the affair. An interesting programme of sporting events was run off and many other features of interest were provided. An exciting baseball match was indulged in between the representatives of the metal workers and those of all other trades. The combination team succeeded in defeating the metal workers by a score of 9 to 1.

The Best HOIST in Canada

Note Well the Exclusive Features

The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

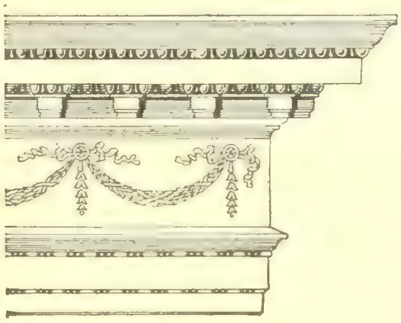
BATTS LIMITED
50 Pacific Avenue - - West Toronto

"A good appearance is a letter of recommendation and a house well built, a monument to the builder."

—The Philosopher of Metal Town.

Superior Quality Material and Workmanship Count

Metallic Cornices

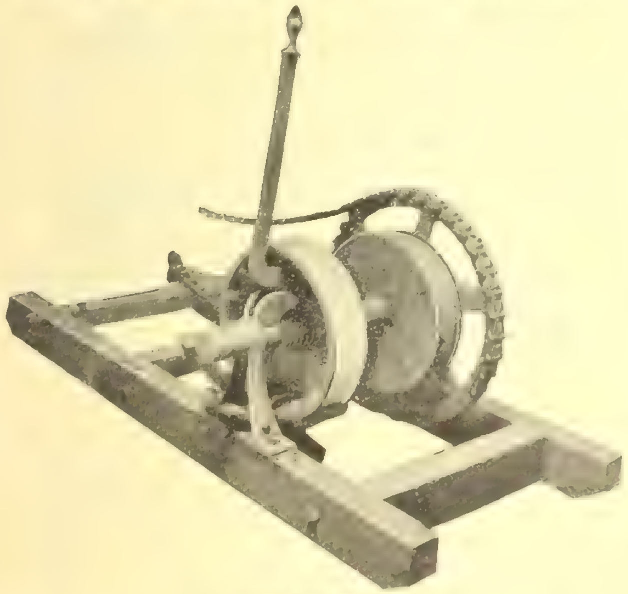


are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, [illegible] engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

Sewerage Acids do not affect the

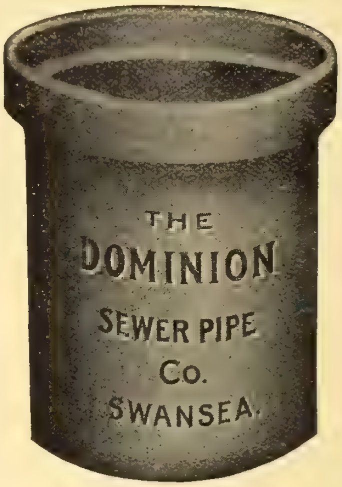
Sizes 3 in. to 36 in.

The Standard for Quality in the United States and Canada

Fancy shapes in Chimney Tops, Fire Clay Stove Pipe and Fittings, Wall Coping, Fire Clay Flue Liners, Fire Brick and Fire Clay.

The Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Glazed Earthenware
in the world.

Sewer Pipe
Single and Double Strength. Sizes 3″ to 42″

Clay Conduits
Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

THE ENGINEER'S AIM

is reached by using

Hamilton Vitrified Salt Glazed Sewer Pipe

W H Y

Why do some Sewers and Drains excel in the Durability Test?
We Know Why

Why do some of the leading Contractors have such Good Success?
We Know Why

Why do most Dealers prefer handling the "Hamilton" Brand?
We Know Why

Why do we defeat our Competitors in Quality and Delivery?
We Know Why

W H Y

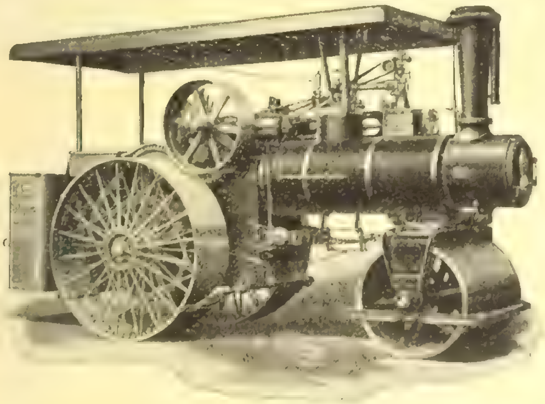
LET US TELL YOU

The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or Write us

Hamilton and Toronto

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description
Guaranteed to do all or Anything that can be done by Any Other Make or Design of Road Roller

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario

Send for our Contractors General Purpose Engine and Municipal Tractor Catalog 26

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world — England, Germany, Spain — to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time "**Metropolitan Block**" are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

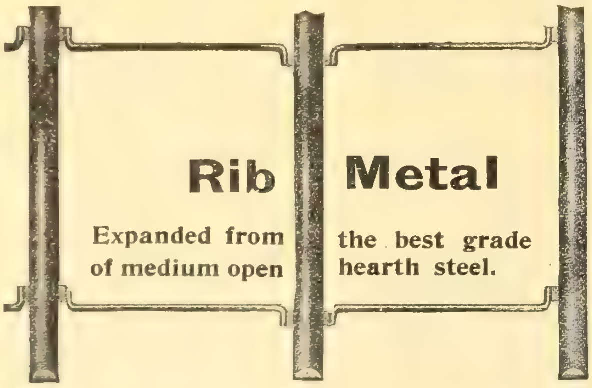
FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.

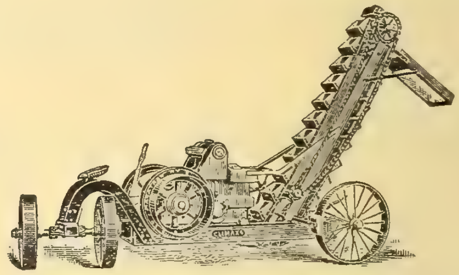

Rib Metal
Expanded from the best grade
of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER-

All sizes ready for shipment.

Catalogues furnished on application.

**The
Climax Road Machine Co.**
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

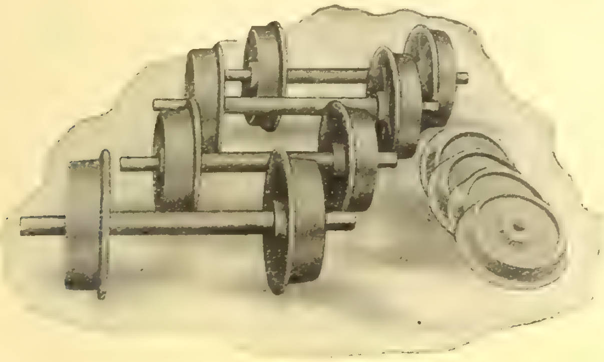
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N.S.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

ROCALITE

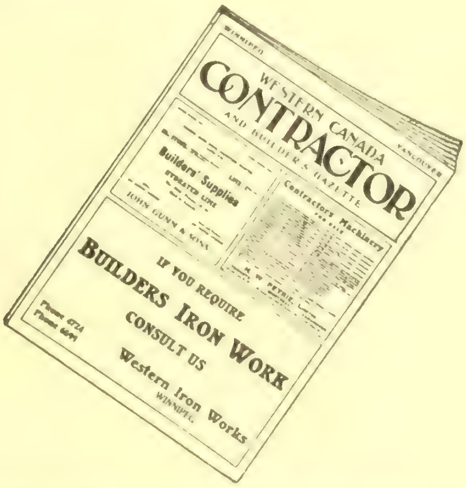
The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDERS GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

"Galvaduct" and "Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

SAND and GRAVEL a Specialty

We have the above in various grades ready for immediate delivery. Let us quote on your requirements

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North { 2107 658

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**

London, Canada Limited

Toronto Office: 103 Pacific Bldg.

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited

9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

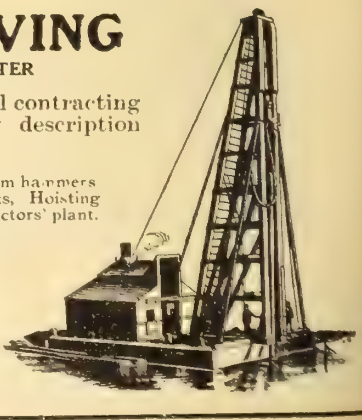
FOR RENT

Pile Drivers, Drop and Steam hammers Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



Harry Allen Jacobs,
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood preserving strains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS { Seymour & Co., Montreal — Henry Darling, Vancouver
A. Muirhead Co., Toronto — Dunn Bros., Winnipeg
W. H. Thorne & Co., St. John

Port Credit Brick

Is the leading building material of to-day because of the strength, color and quality. We make the following:

Repressed Wire Cut Brick
Common Wire Cut Brick
Pressed Brick
Paving Brick
Our prices will interest you.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Crushed Stone, Limited

STONE of any Size and in any Quantity on Land for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Sand & Supplies
LIMITED
Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite Crushed Stone and Sewer Pipe

M. 4507

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

The KATIE Foundry, Galt, Ont.

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Western Lumberman

Representing the Lumbering and Woodworking interests of British Columbia Alberta Saskatchewan and Manitoba

Winnipeg, Manitoba

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St. Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., v th 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i........	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65

No. 4½ Fuller's ....net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b. Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35-cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.

Turpentine, in barrels, 89 cents per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

CHIMNEY DRAUGHT.

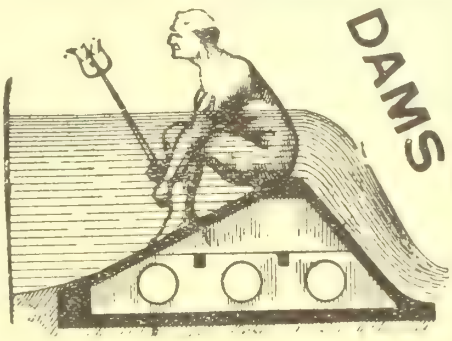
In order to have a good draught, a chimney ought to satisfy the following conditions:

The section of the chimney ought not to be larger than is necessary to allow an exit for the products of combustion, otherwise ascending and descending currents are produced in the chimney, which cause it to smoke. It is advantageous to place on the top of the chimney a conical pot narrower than the chimney, so that the smoke may escape with sufficient velocity to resist the action of the wind.

The chimney ought to be sufficiently high; for, as the draught is caused by the excess of the external over the internal pressure, this excess is greater in proportion as the column of heated air is longer.

The South Shore Lumber Company, Montreal, Que., capital $20,000. Incorporators, Harold E. Walker, advocate, and James R. Walker, manufacturer, both of Westmount, Que.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greenville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

German Alsen, at **higher prices** than competitors, has again this year been awarded the **most important contracts** of the World, because practical tests by leading Engineers proved its merit and **relative economy.**

Note the following:

	1905-1906
Mexico City	120,000 bbls.
Necaxa Dam (shipping instructions so far 60,000 bbls.) approximate amount	175,000 bbls.
Xochimilco Water Works. Mex. approx.	200,000 bbls.

	1905-1909
U.S. Philippine Govmt.	40,000 bbls.
Govmt. Order South America	150,000 bbls.
Rio de Janeiro, Satos, etc.	40,000 bbls.

Also enormous quantites for the Pacific Coast, Australia, England, South Africa, &c.

There is always a certain trade who WILL PAY for THE BEST We also American Alsen, the highest grade of domestic Portland Cement.

Cement 45 BROADWAY - NEW YORK CITY **Cement**

We protect our customers! - See page 155 in "Sweets" for full particulars.

Maple Flooring

We have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

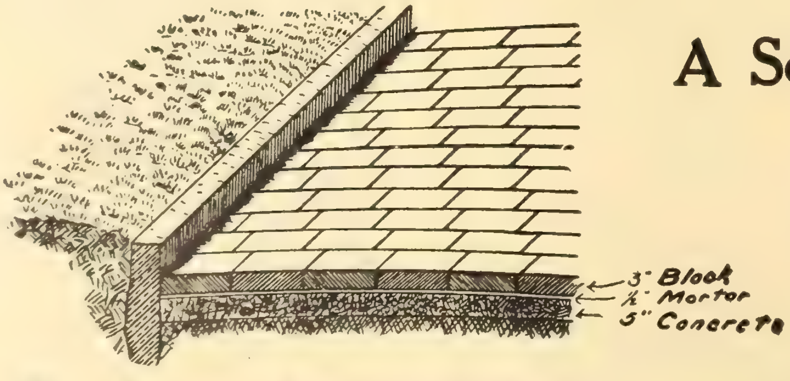
The Last Word in Wire Lathing

1910 **Patented Trussed** 1910

Wire Lath

FOR DESCRIPTION AND PRICES
APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand"
Hard Wall Plaster

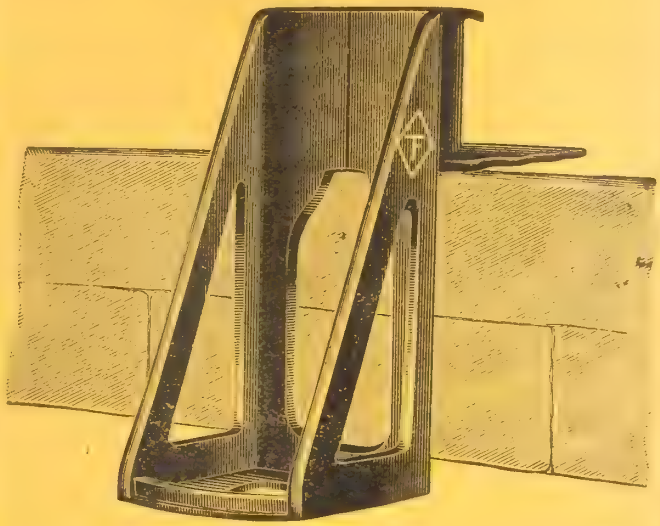
HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

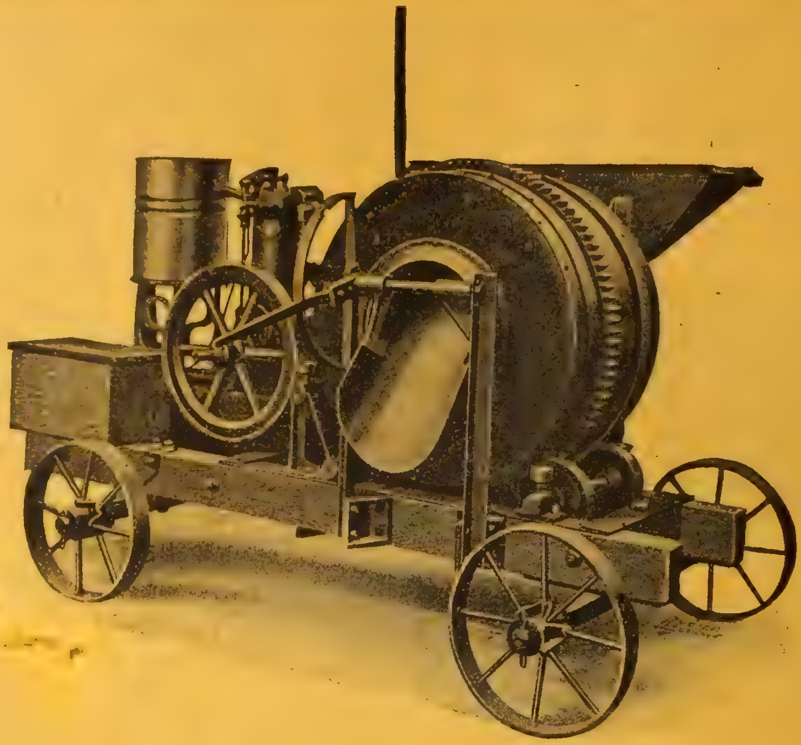
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



This is Every Man's Mixer

NO. 4 RANSOME—NEW 1910 MODEL

A last the demand for a really **small** concrete mixer is satisfied. Hold on, now, Mr. Big Contractor, that doesn't let **you out**, either. This is **Every Man's Mixer**—the mixer that fits into everybody's need. There isn't a concrete job on earth so small that it can't be done better and cheaper with this new model No. 4 Ransome, and there isn't a contractor anywhere whose work is so big that he will not find it a convenience and an economy to have one of these little No. 4's in addition to his larger machines. The No. 4 can be used on the small, isolated parts of jobs where it wouldn't pay to move a big machine.

Everybody who builds concrete walls, concrete walks, concrete **anything**, can have the best concrete that can be made at the least possible cost, because our new No. 4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an **exact reproduction**, on a small scale, of the Ransome that made the correct mixing of concrete **cheap**—it's the same wonderful mixer in miniature. This is **the first really modern, effective, and economical small mixer ever put on the market.**

The following description of the No. 4 Ransome will show you what a truly **complete** and highly efficient mixing outfit you can buy at a very low price.

It has a batch capacity of 4 cubic yards per hour, which is ample for any small concrete job.

It is made and sold in **one way only**, i.e., **mounted on trucks**, with a Gasoline Engine, **direct drive**. This is a powerful engine for its rated H.P. and the best designed—a most perfect-operating engine.

The No. 4 is fully equipped with **Gasoline Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates** and All Necessary Engine and Mixer Fittings—**an absolutely complete outfit, ready for perfect operation.**

The Drum is 36" in diameter and 24½" in length, and has a speed of 24 revolutions per minute.

For its size this is the most substantially built mixer. The drum plates are ⅛" thick; the scoops ⅛" thick; the counter shafts 1 7/16"; the traction rings ½"; face of traction rings 1½".

The mixer has only 16 parts all told and **only four wearing parts.** It is the Extreme of Simplicity—you can keep one extra part on hand—a journal. The journals are the only wearing parts. No danger of breakdowns. It is everlastingly durable and reliable.

The No. 4 Ransome is a great time saver in every respect. The charging hopper is being filled **while the batch is mixing,** so that no time is lost in charging. The batch is instantly discharged by merely reversing the discharge chute.

It is also a great economizer of **time** and **labor** because it is **not a tilting mixer**—it needs no room for clearance—is mounted several feet lower than any tilting mixer—a great saving in time and labor of elevating the materials into the mixer.

The No. 4 Mixer is equipped with a **series** of blades or scoops inside the drum, which produce a rubbing-grinding contact of the particles in the concrete, a combination of rolling contact with forcible kneading. Being the same in this respect as the larger Ransomes, it follows that the user of the new No 4 Ransome, although mixing in small batches, will get precisely the same **intimate** and **thorough** mixture for which the Ransome is unique The user of a No. 4 may know positively in advance that his concrete will be a perfect, uniform mixture—sound throughout—no unmixed spots anywhere—no danger of the concrete crumbling after setting.

Because of this thorough mixing, the No. 4 Ransome permits of **real cement economy.** It will give **maximum** strength with the **minimum** cement countenanced by engineers.

The new 1910 Model No. 4 Ransome is small, compact, easily **portable.** Mixer, engine, and trucks complete, weigh 1750 lbs.

We carry No. 4's in our Warehouses for immediate delivery. Write for price, terms and additional information.

We give with each of these mixers an absolute and unequivocal **guarantee** that the No. 4 Ransome under equal conditions will mix more concrete, mix it better, in less time, and with less labor, repairs and expense, than any other mixing device.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

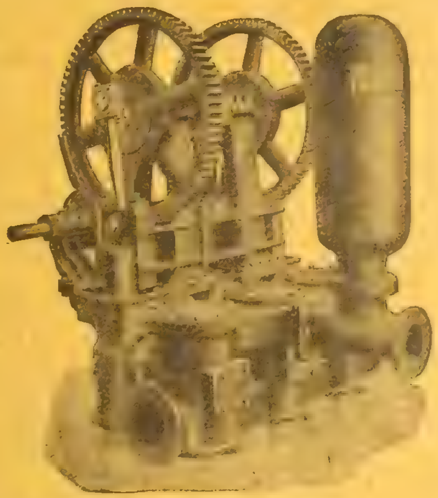
Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, August 17, 1910 No. 33

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



Power and Steam Pumps

Condensers

Travelling Cranes, etc.

WRITE FOR CATALOGUE

The Smart-Turner Machine Company Limited
HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

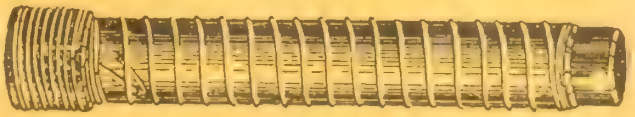
We Can Give Satisfaction in all kinds of

Structural Material

ANGLES BEAMS
CHANNELS PLATES
TEES, Etc.

Let us quote on your specification

A. C. Leslie & Co., Limited
Montreal



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

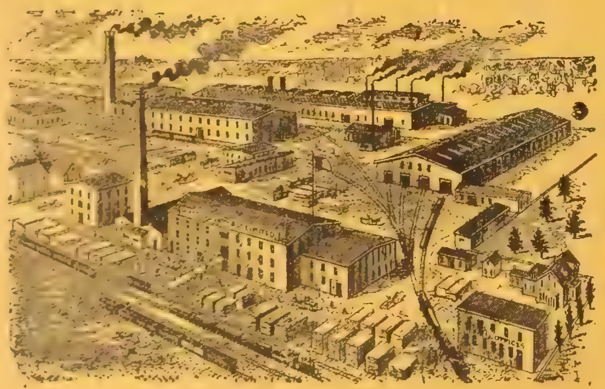
The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Rhodes, Curry Co., Limited
Lessees



Bank and Office Fittings
SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N.S.
BRANCHES AT
Halifax Sydney

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy

or any kind of

Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND

CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page
Canada Wire Goods Mfg. Co. 15
Dennis Wire & Iron Works 58

Boilers
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 51
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co ....
Waterous Engine Works Co. 16

Brick
American Enamelled Brick Co. ....
Canadian Pressed Brick Co. 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co. 5
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co. 34

Bridges (Steel)
Canadian Bridge Co. 18
Cleveland Bridge Co. 18
Dickson Bridge Works 63
Dominion Bridge Co. 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware
Taylor-Forbes Co. ....

Cement
Alsen Portland Cement Co. 62
Britnell & Co 58
Bremner, Alex 57
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 60
Rogers, Alfred 4
Rogers Supply Co. 31
Sand and Supplies 59

Conduits Page
Conduits Co., Limited 58

Concrete Mixers and Machinery
Canada Foundry Co. 14
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F., H. 64
Jenckes Machine Co. 2
London Concrete Machinery Co. 21
Mussens Limited 32
Morrison & Co., T. A. 60
Rogers Supply Co. 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co. ....
Canada Wire Goods Mfg. Co. 15
Hamilton Iron & Steel Co. 34
Trussed Concrete Steel Co. 56

Contractors' Plant
Beatty & Sons, M. 51
Hepburn, John T. 17
H. & E. Lifting Jack Co. 19
Hopkins & Co., F. H. 64
Katie Foundry Co. 60
Marsh & Henthorn 51
Mussens Limited 32

Crushers (Stone and Rock)
Hopkins & Co., F. H. 64
Jenckes Machine Co. 2
Mussens Limited 32
Morrison & Co., T. A. 60

Corrugated Iron
Galt Art Metal Co. 20
Metallic Roofing Co. 53
Metal Shingle and Siding Co. ....
Ormsby, A. B., Limited 5
Roofers Supply Co. 57

ontractors Page
McIlwraith, Jas. A. 60

Drills
Beatty & Sons, M 51
Canadian Rand Co. 1

Deafening Felts
Cabot, Samuel, Inc. 59

Drilling Contractors
Harvey, J. 61

Dredges
Beatty & Sons, M 51

Engines
Canadian Boving Co. 51
Inglis, John 22
Jenckes Machine Co. 2
Mussens Limited 32
Waterous Engine Works Co. 16

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co. ....

Engineers (Civil and Mechanical
Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Davis & Johnston 60
Farmer, John T. 60
Fuce, Edw. O. 60
Galt Engineering Co., John 60
Glaubitz, H. J. 60
Hunt & Co., Robt. W. 59
Inglis, John 22
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H. 60
McRae, John B. 60
Moore & Scollan 60

Fire Apparatus Page
Morrison & Co., T. A. 62
Seagrave, W. E. 58

Fireproof Doors and Windows
Douglas Bros 16
Mussens Limited 32
Ormsby, A. B. 5

Granite and Marble
Laurentian Granite Co. 60
Missisquoi Marble Co. 13
Rogers Supply Co. 31
Smith Marble & Construction Co. 55

Glass
Chance Brothers & Co. ....
Consolidated Plate Glass Co. 2
Luxfer Prism Co. ....
Thompson & Co., B. & S. H. ....
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. ....
Taylor-Forbes Co. ....

Hoisting Machinery
Beatty & Sons, M. 51
Inglis, John 22
Jenckes Machine Co. 2
Hopkins & Co., F. H. 64
Marsh & Henthorn 51
Mussens Limited 32
Scott Machine Co. 53

Hydrants
Canada Iron Corporation 57
Gartshore-Thompson Pipe Co. 56
Kerr Engine Co. 8

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

THE
MILTON
PRESSED BRICK CO.
LIMITED

For 20 Years The Finest Brick Made
Milton Pressed Brick

is the hardest and smoothest brick - is perfect in mould always uniform in size—clean cut cannot collect dirt absolutely free of sand and gravel improves with age—and looks as fresh and clean after 20 years' use as when first put in the wall.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St,

For Apartment Houses and Office Buildings

or any building where appearance is a consideration. Our KALAMEINED CLAD FIREPROOF DOORS have the artistic appearance and at the same time give Fire Protection. **We make them by machinery,** the wood and the iron become practically one. There is no bulging. They can be finished to any detail with trim to suit and they **mean a reduction in Insurance Rates.**

Let us give you an approximate figure.

A. B. ORMSBY, Limited

Factories
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	53
Blonde Lumber Co	
Delaplante, Ltd	20
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	63
Rhodes Curry & Co.	2
Sanitary Floor Co.	15
Siemon Bros	53
Standard Mills, Limited	62
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	20
Metallic Roofing Co.	53
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptuno Meter Co.	15

Paving and Paving Materials

Dominion Carbolineum Works	12
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	
Britnell & Co	58

Pipe

Canadian Pipe Co.	56
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	56
Municipal Construction Co.	17
National Iron Works	57
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	59
Glidden Varnish Co.	34
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	58

Pumps and Pumping Machinery

Beatty & Sons, M.	52
Goulds Pump Co.	
Hopkins & Co., F. H.	64
Inglis Co, John	22
Martin Steam Pump Co.	63
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	55
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	16

Roofing Materials

Barrett Mfg. Co.	
Brantford Roofing Co	11
Galt Art Metal Co.	20
Metallic Roofing Co.	53
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	57

Railway Supplies

Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	14
Case Threshing Machine Co.	55
Climax Road Machine Co.	56
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	54
Britnell & Co	58
Canada Iron Corporation	57
Dominion Sewer Pipe Co.	54
Gartshore-Thomson Pipe Co.	56
Hamilton & Toronto Sewer Pipe Co.	55
National Iron Works	57
Ontario Sewer Pipe Co.	10
Rogers Supply Co.	31
Standard Drain Pipe Co.	54

Sand

Rogers Supply Co.	31
Sand & Supplies	59

Stone

	Page
Britnell & Co.	58
Christie, Henderson & Co.	17
Consolidated Stone Co.	20
Contractors' Supply Co.	57
Corinthian Stone Co.	15
Crushed Stone, Limited	59
Doolittle & Wilcox	57
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	59
Robertson, D	15
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	59
Wiarton Stone Quarry	61

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	18
Hamilton Iron & Steel Co.	34
MacKinnon Holmes & Co.	19
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H.	19

Shovels (Steam)

Beatty & Sons, M.	51
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	59

Slate

Roofers Supply Co.	57

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Safes and Vaults

Taylor, J & J	

Sheathing Papers

Cabot, Samuel, Inc.	59

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	55

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	19

Typewriters

United Typewriter Co.	62

Valves

Canada Iron Corporation	57
Gartshore-Thomson Pipe Co.	56
Kerr Engine Co.	
Standard Fitting & Valve Co	63

Ventilating System

Gardiner & Gaskill	16

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	59

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	

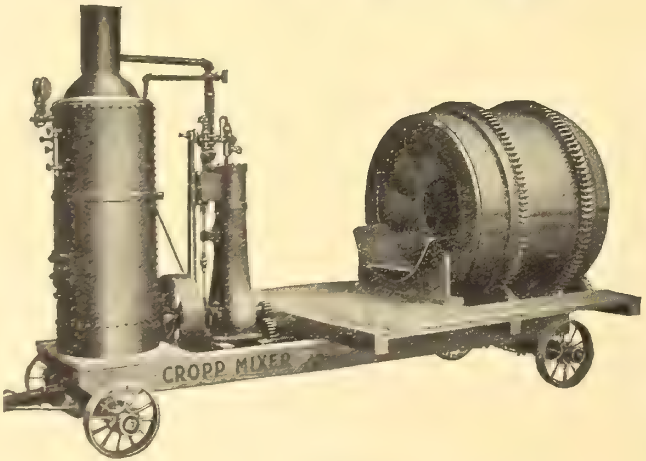
Wire Guards and Screens

Canada Wire Goods Mfg. Co.	15

Water Wheels

Canadian Boving Co.	51

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

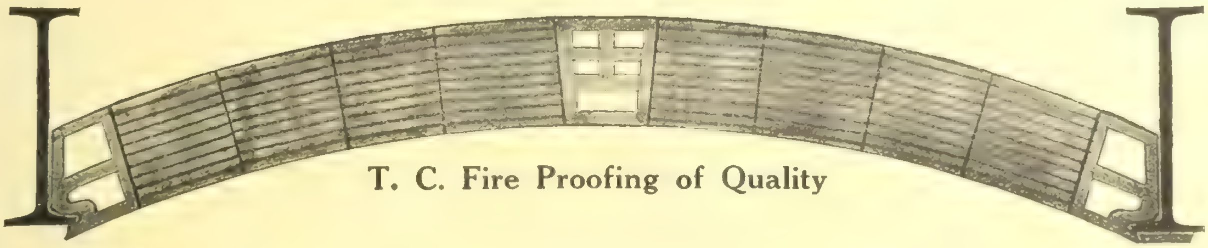
Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering
Arches

Furring
Blocks



T. C. Fire Proofing of Quality

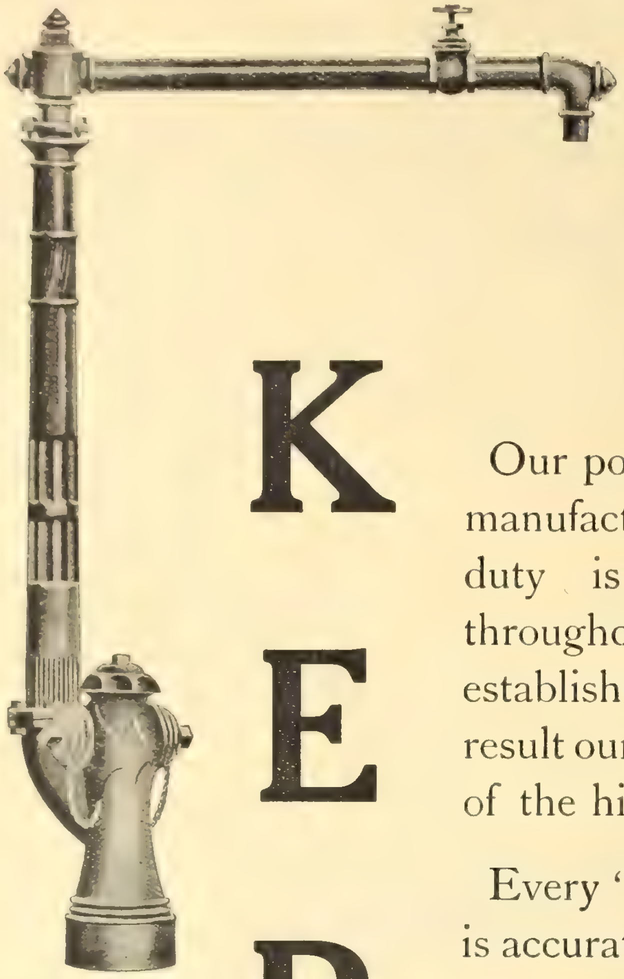
DON VALLEY

- Pressed Brick
- Enamelled Brick
- Vitrified Brick
- Porous Terra Cotta Brick
- Wire-Cut Brick

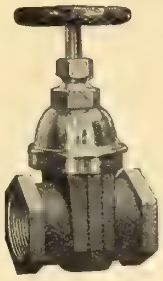
THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**



Water Crane and
Hydrant Combination



Webber Gate
(Brass

Hub End Gate

Indicator Post for
Fire Protection Valve

IRON

BODY

GATE

VALVES

K E R R

Our policy of careful manufacture for severe duty is maintained throughout our whole establishment and as a result our products are of the highest quality.

Every "KERR" valve is accurately made and finished. They are perfectly tight when closed and have full area when open.

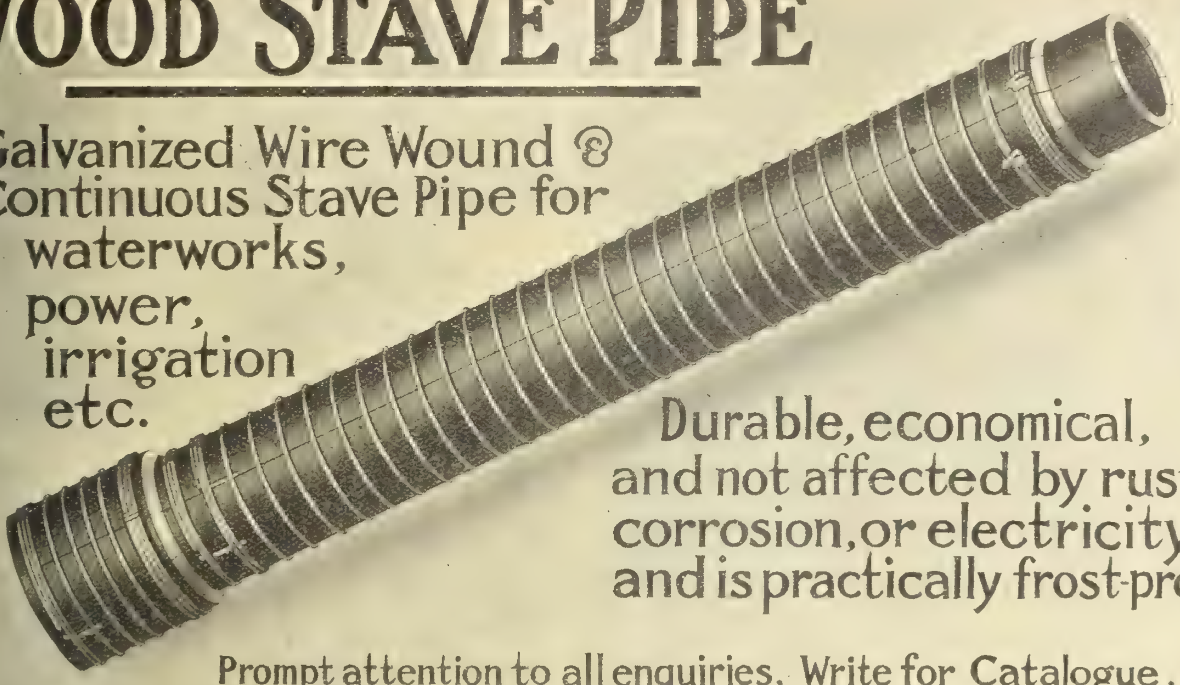
We have a complete catalogue

Have you a copy of it?

VALVES

Compression
Hydrant

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.



WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

VITRIFIED CLAY PIPE

Are the only permanent sanitary Pipe for Sewers. If you don't believe us (of course we must be prejudiced) read up the subject. There's plenty written on it.

Many towns and cities have bought experience dearly by putting in a substitute for **VITRIFIED CLAY.** If you want facts and figures, we can readily furnish them.

A fool learns at his own expense, the wise man at the expense of the other fellow. You wise **COUNCILMEN** ought to be sure of all your steps. Do not be misled by one man who thinks he knows. Ask of the great majority who do know.

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

"Brantford Specification" is now the choice of many builders and contractors

Easily and quickly laid

For stores, factories, and other buildings with flat roofs, Brantford Specification is particularly suitable. It makes a durable, lasting roof-protection at the minimum of expense.

Either Brantford ASPHALT Roofing or Brantford RUBBER Roofing is used for Brantford Specification. It is laid double, with Branroco Cement between laps. The nails are two to three inches apart and all nail heads are covered. By following our instructions for laying, the job can be easily and quickly done, and the roof made absolutely waterproof.

No coal tar is used for Brantford Specification. Coal tar gets soft and melts in summer, and becomes brittle and cracks in winter. Our saturation is 99 per cent. pure Asphalt. Asphalt of this quality and purity does not melt in summer nor crack in winter. It is the most durable saturation known.

The material for Brantford Specification retails from $5.00 to $7.50 per square, according to the thickness of the roofing. Brantford ASPHALT and Brantford RUBBER Roofing are both made in 1, 2 and 3 ply.

Further information about Brantford Specification will be promptly furnished on request.

Brantford Roofing Company, Limited

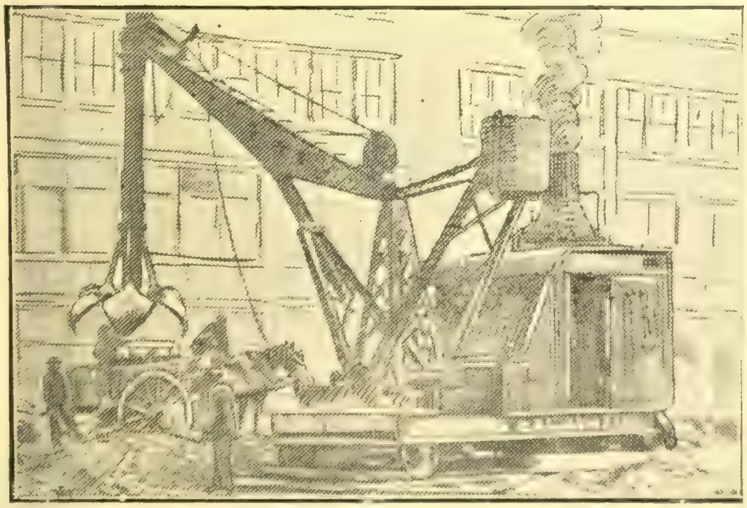
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

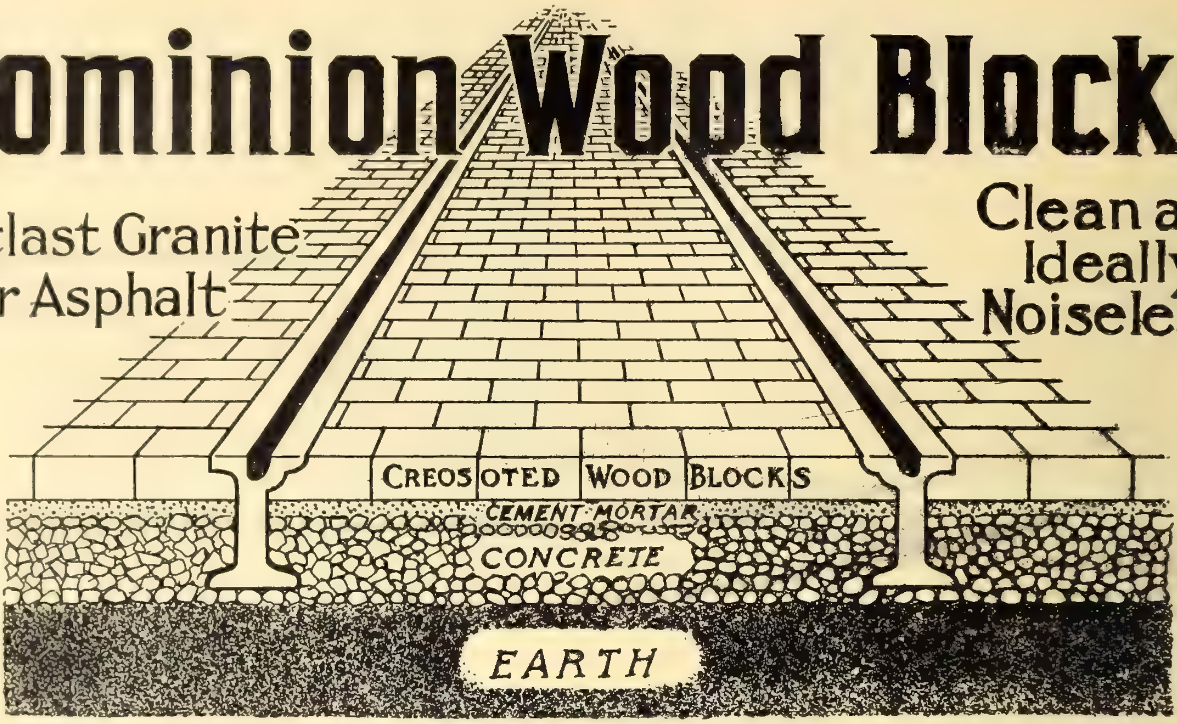
J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



A Pavement that Gives Ideal Results

Dominion Wood Blocks make a pavement that is exceptionally sanitary and satisfactory.

The wood does not pulverize, like brittle stone pavements, and does not produce dust.

The blocks are made of live Douglas fir (best timber in the world for the purpose), they are made waterproof, and they will not decay because they are impregnated with creosote.

There will be no ruts along the street car rails because the Wood Blocks do not suffer from vibration.

Dominion Carbolineum Works LIMITED
Vancouver, B.C.

"Made-in-Canada"

goods are being used now by everybody and we are proud of them because they are often better than imported materials

Quarried-in-Canada

marble is just as good as fancy-priced imported marble and comes in six well-defined varieties which allow of elaborate color schemes.

The Missisquoi Marble Co., Limited
Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

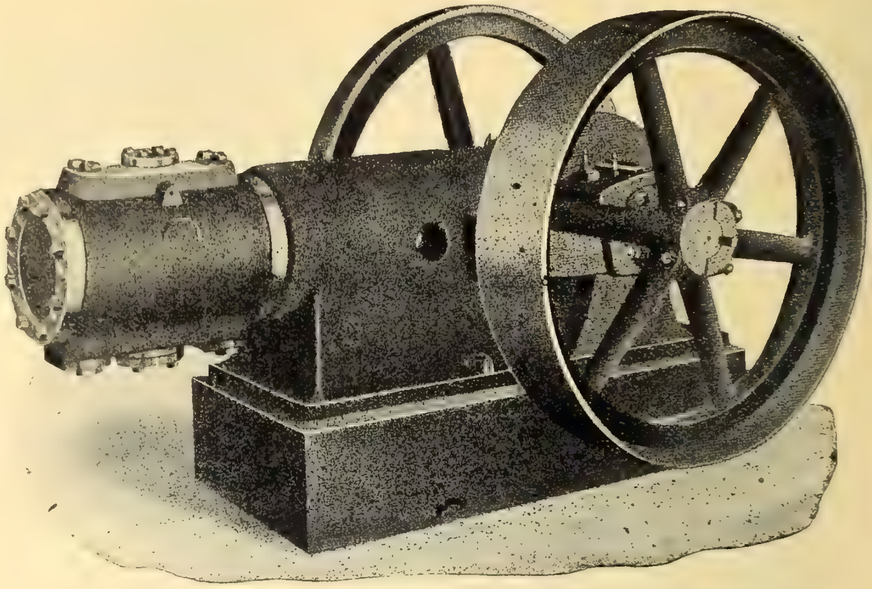
David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
Bosse & Banks, Quebec
Jas Robertson & Co., St. John, N. B.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver
General Contractors' Supply Co., Halifax
Also Branch Office, 85 Sparks St., Ottawa, Ont.

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



Canada Foundry Company, Limited

Head Office, TORONTO

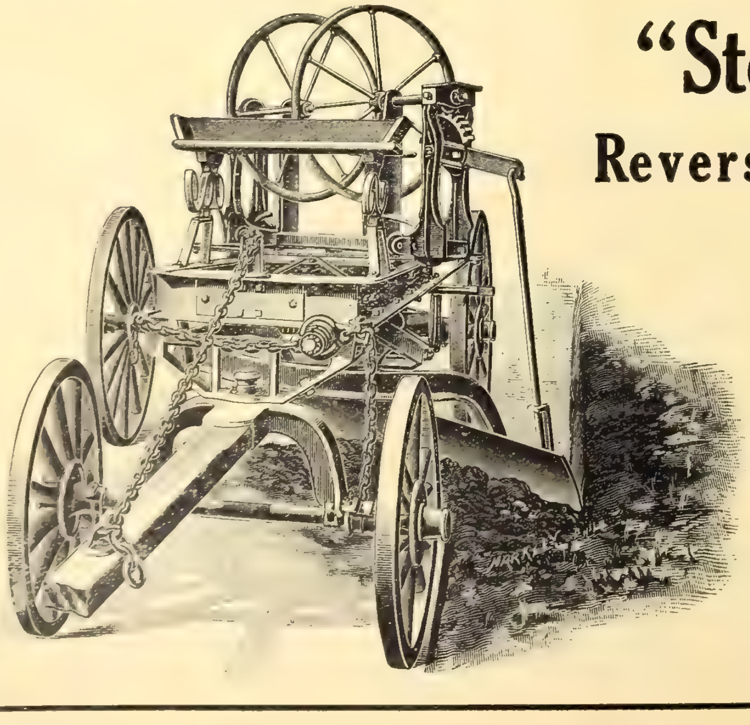
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario
Designers and builders of road making and contractors machinery

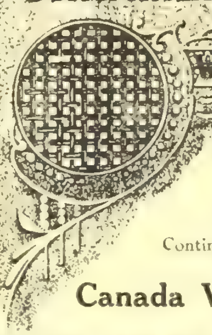
Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.



ORNAMENTAL IRON WORK

WIRE CLOTH

WIRE GOODS

Get our prices on our

CONCRETE REINFORCEMENT

Continuous lengths or in sheets cut to size

WINDOW GUARDS

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone

Company, Guelph

from the hardest substances available

Write the

Corinthian Stone

Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT

Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.

CUT STONE

All kinds of Canadian and American Stone

D. ROBERTSON & CO.

Limited

Offices:
75 Yonge Street, TORONTO
MILTON, Ont.

Yard:
Manning and Dupont, TORONTO

Quarries:
MILTON
CREDIT FORKS

Telephones
Toronto M [illegible]
Milton [illegible]

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

(Patented)
Autoforce Air Pump Ventilator

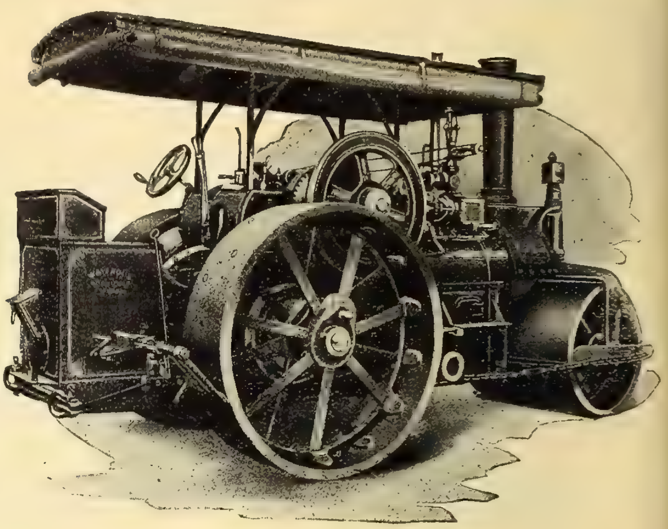
Write us for full Particulars

Sole Licensees and Manufacturers for Canada:

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

A Double Cylinder, Double Crank Roller

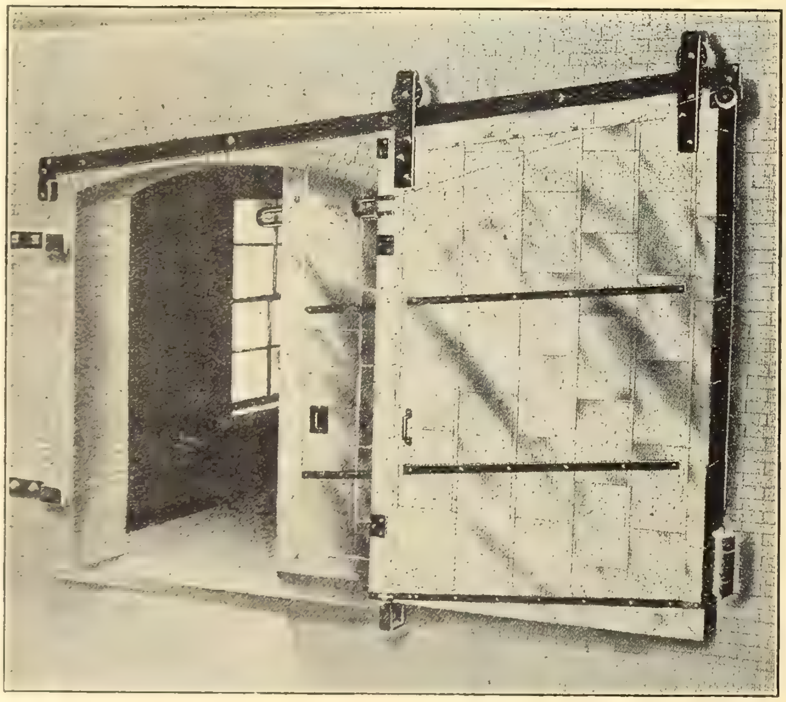


The Waterous

A Canadian Roller for Canadian Roads

This Roller is known as "a Good Roads Pioneer" from Vancouver to Sydney. Fully illustrated and described in our new 20 page catalogue No. 301. Send for it.

The Waterous Engine Works Co., Limited
BRANTFORD, CANADA



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE
All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

is the best

BECAUSE

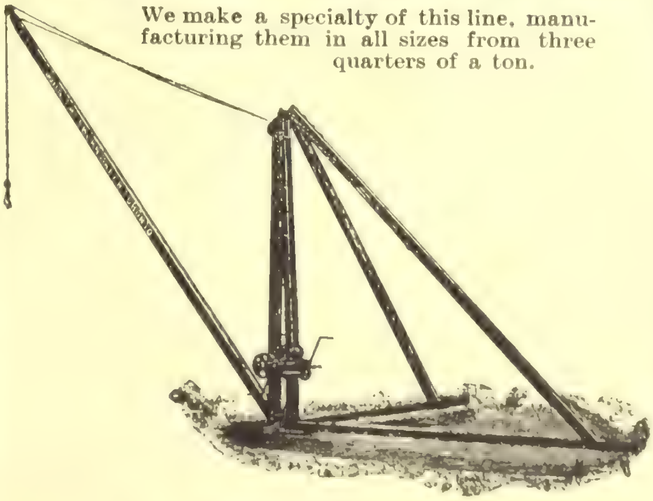
It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks



We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.

Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the "New State" Concrete Mixer.

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

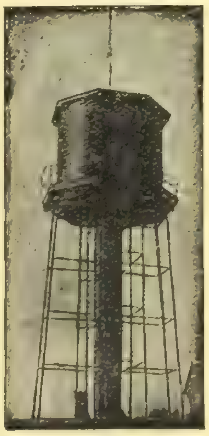
Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.



Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.

Limited

Civil and Mechanical Engineers, Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The Phœnix Bridge & Iron Works Limited

MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**
Office Phone P. 64 Residence P. 1040

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used, Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

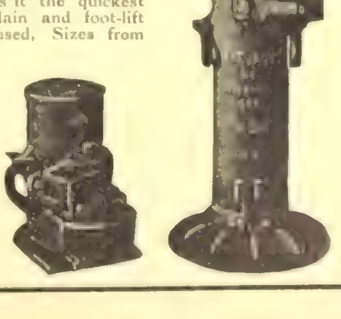
To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

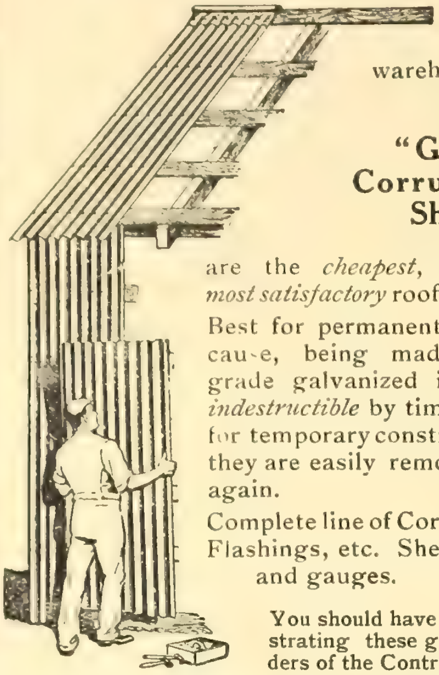
H. & E. Lifting Jack Company

Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal



Corrugated Iron



For factories, elevators, warehouses, barns, etc.

"Galt" Corrugated Sheets

are the cheapest, *handiest*, and *most satisfactory* roofing and siding. Best for permanent buildings because, being made from high-grade galvanized iron, they are *indestructible* by time or fire. Best for temporary construction because they are easily removed and used again.

Complete line of Corrugated Ridge, Flashings, etc. Sheets of all sizes and gauges.

You should have Catalog 4-B illustrating these goods, free to readers of the Contract Record.

THE GALT ART METAL CO., LTD.
GALT, ONTARIO
Winnipeg - - Dunn Bros.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

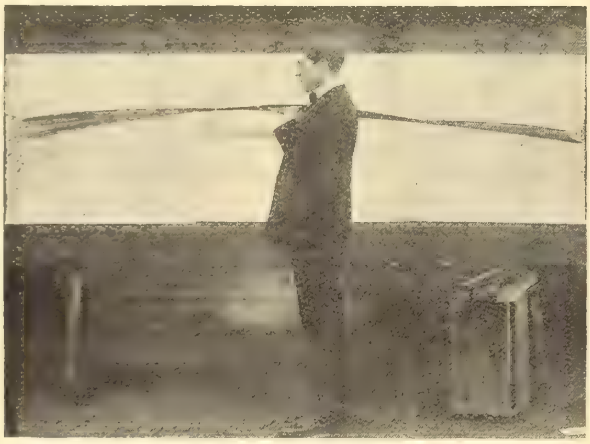
The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange



You would think it is a board,
wouldn't you? It's not. It is a 27 gauge sheet of

Herringbone Lath

taken from stock. It is by far the stiffest lath on the market—so stiff it is used just like wood lath on sixteen inch stud spacing. Cheaper laths take more plaster and require more wood framing.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

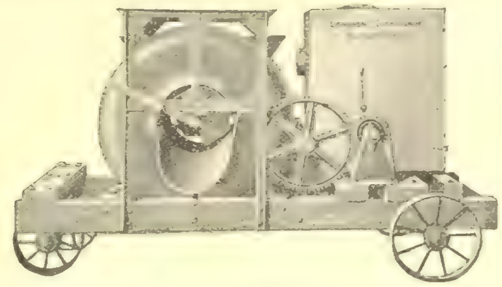
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Standard Drum Batch Concrete Mixer



Meet us at Toronto Exhibition, we will have the largest exhibit of Concrete Machinery ever shown (on the Ground south-east of Machinery Hall.)

We Can Save You Money {
On the first cost of machine
On cost of operation
On cost of mixing concrete

This machine is manufactured in several sizes and with every equipment desired. Let us tell you all about it. State capacity required when writing. We also manufacture the now famous London Automatic Batch Mixers No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full Line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada **Limited**

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada.

CONTRACTORS' SUPPLIES

If you are in need of

Doors	Ceilings
Sash	Mouldings
Frames	Stairs

Hardwood Flooring
(Empire Brand)

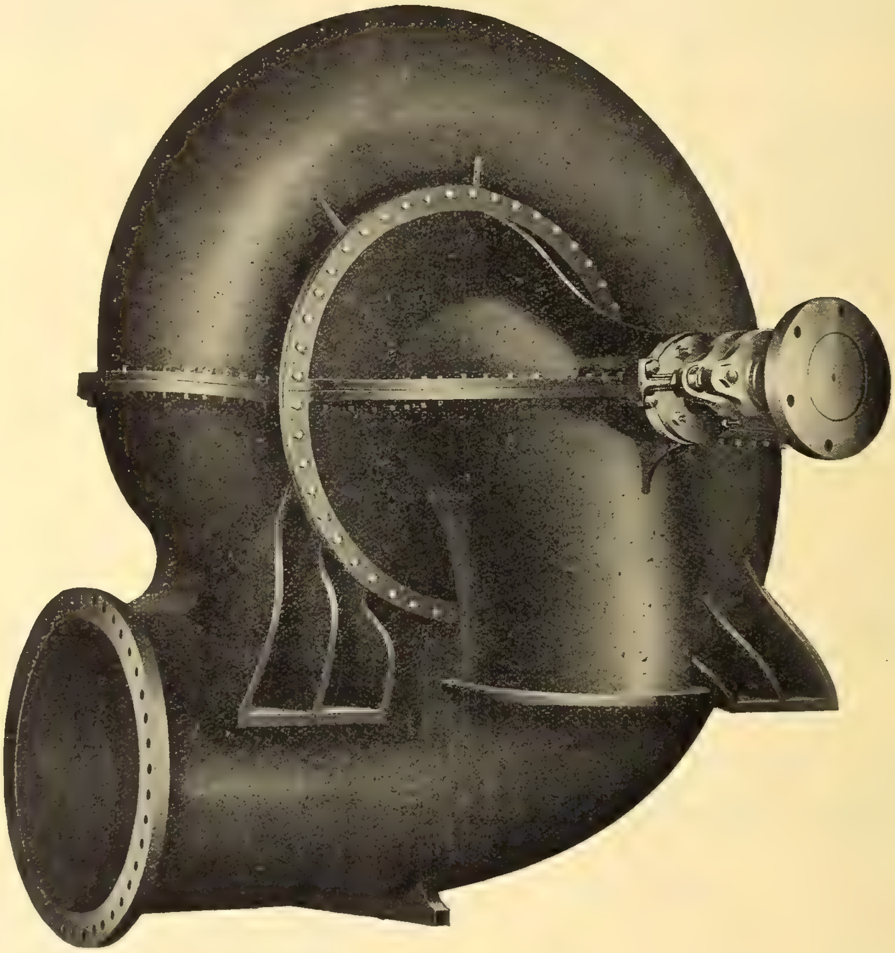
just let us know and we will ship your orders promptly. Mixed cars a specialty. We also carry Hemlock and Pine (rough or dressed.)

J. R. Eaton & Sons

Orillia, Ontario

Montreal Agent: C. A. SPENCER, 55 St. Francois Xavier St.

Centrifugal Pumps



The Pump illustrated above was built by us for the City of Toronto Filtration Plant. It has a capacity of sixty million gallons per twenty-four hours. If interested in this type of pump we will gladly furnish detailed specifications and prices.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brantford, Ont.

Tenders addressed to the chairman of the Board of Works will be received until August 20th for construction of concrete curbs on Cayuga street. Plans and specifications at office of T. Harry Jones, City Engineer.

Fernie, B.C.

A by-law will be submitted to raise $27,000 for the construction of a sanitary sewer east of the Crow's Nest Southern Railway.

London, Ont.

Tenders for grading Adelaide and Oxford sreets, and laying 1,350 feet of land tile, will be received at the City Clerk's office up to August 18th. Plans and specifications at office of Geo. W. Wright, City Engineer.

Tenders will be received up to August 18th, addressed to Chairman No. 2 Committee, for storm water drain on Johnston street. Geo. W. Wright, Deputy City Engineer.

Medicine Hat, Alta.

The city is talking of replacing all wood pipes by iron pipes in waterworks and sewage.

Moose Jaw, Sask.

Tenders addressed to J. H. Trusdale will be received until August 22nd for laying and furnishing material for water mains and sewer pipes. Plans at office of Geo. T. Clark, city engineer.

Montreal, Que.

Tenders addressed to L. N. Seneca!, secretary, Board of Commissioners' office, City Hall, will be received until August 17th for the construction of sewers in the under. mentioned streets or sections of streets with the necessary connections according to the sections and specifications on view in the office of the City Surveyor, viz.:—Hutchison street, from Bernard street to Atlantic street (Laurier Ward); Fourth avenue, from Dandurand street to LaPetite Cote road (in Rosemount).

Tenders addressed to L. N. Senecal, secretary, Board of Commisioners, will be received until September 14th for steel pipe, dredging work and concrete pier in connection with the new intake for the Montreal waterworks. The works consist in the furnishing and laying in the bed of the river, of about 3,200 feet of steel pipe, 6 feet in diameter; the construction of a concrete intake pier 1,200 feet from shore, as well as other accessories, and all the dredging and excavating required in the execution of these works; all according to specifications, plans and profiles, which may be examined or obtained at the office of the Superintendent of Water Works, City Hall, Montreal.

New Glasgow, N.S.

The town has completed plans for a gravity system for the town to cost in the neighborhood of $200,000. Surveys have been made, profile of line has been completed and the by-law will be submitted to the ratepayers very shortly.

New Westminster, B.C.

Tenders for paving another stretch of Columbia street were opened in the city council last week. The lowest was the Hassam Paving Company, which tendered $62,-800. The Warren Construction Company, Limited, was next with $63,114; then the R. C. Blome Granitoid Company, with $64,-000, and the [illegible] P. Cotton & Company, Limited, with $68,152. The tenders were referred to a special meeting of the council.

Outremont, Que.

Tenders addressed to J. Kreuse, secretary-treasurer, will be received until August 17th for construction of 900 yards of concrete slab sidewalk. Specifications on application.

Ottawa, Ont.

The city council are considering the widening of Wellington street in Hintonburg at an estimated cost of $18,000.

Prince Albert, Sask.

A by-law will be voted on to expend $12,-000 for a filtration plant.

Peterboro, Ont.

R. S. Armstrong, city clerk, will receive tenders up to September 1st for sanitary and storm sewers, air compressors, etc. Chipman & Power, Mail Building, Toronto, are the engineers. For further particulars see "Tenders and For Sale Department" of this issue.

Souris, Man.

The J. L. White Company, of Sioux Falls, S.D., will instal a waterworks system here, the by-law having carried.

St. Catharines, Ont.

Engineer Kennedy has submitted a report for the improvement and extension of the waterworks at a cost of $52,000.

Toronto, Ont.

City Engineer Rust estimates the cost of construction of the pavement on Beverley street, from Queen to College, at $10,332.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until August 23rd for supply of special castings for electrical pumping equipment of the high level pumping station. Specification at office of City Engineer Rust.

In order to provide drainage for the southern part of West Toronto, City Engineer Rust recommends the construction of a 3-foot main sewer, commencing at Bloor street, south on Keele street to Geoffrey street, and thence by various streets and along Queen, to the intersection of King street, to meet the intercepting sewer at this point. To provide drainage for the district bounded by Bloor street, High Park avenue, Annette street and the western city limits, it will be necessary to lay a sewer on Bloor street, from Glendennan avenue, to connect with the above sewer near the corner of Bloor and Keele streets. Mr Rust recommends that this be a [illegible] circular brick or concrete sewer. This will be large enough to carry the combined flow from this section.

Victoria, B.C.

At a recent meeting of the city council tenders for the laying of the foundation curbs and gutters and sidewalks on Yates street between Douglass street and Blanchard street were opened. The city engineer's figures were $6,923, while the other tenderers were Hugh McDonald at $14,000, and Thomas Stedham at $8,824. The city will do the work.

At a recent meeting of the city council tenders for the supply of the necessary parts to replace the defective portions of the pumping engines supplied by the D'Olier Engineering Works for the salt water high pressure system, were received from the John McDougall Company, of Montreal, for $5,980 and $6,480, and from J. B. H. Rickaby, Victoria, for $5,864.19. The tenders were referred to the electric light committee.

Asphalt will be used largely in future street improvements, according to a report submitted by the city engineer which contains the following recommendations:—Manchester road, change from rock surface to asphalt; Richardson street, change from rock surface to asphalt; St. Lawrence, change from rock surface to asphalt, adding curb and gutter in two blocks only; St. Andrews street, change from rock surface to asphalt; Quadra street, between Blanchard and Hillside, change from tar macadam to asphalt; Langford street, change from rock surface to bituminous macadam; Gladstone avenue, change from rock surface to bituminous macadam; McKenzie avenue, change from rock surface to asphalt; Fell street, change from rock surface to bituminous macadam; Rockland avenue, between Vancouver and Moss, change from rock surface to asphalt and add curb and gutter and boulevards between Cook and Vancouver; Harbinger avenue, change from rock surface to asphalt; Fernwood road, change from rock surface to asphalt; Lotbiniere street, change from rock surface to asphalt; Craigflower road and Russell street, change from tar macadam to asphalt and add curb and gutter and sidewalk.

Winnipeg, Man.

The city council has passed local improvements to the extent of $221,922. Most of this work goes to the city's engineer of construction.

AWARDED.

Collingwood, Ont.

The contract for [illegible] square yards of tar-lithic paving has been awarded to J. Conn, of Windsor, Ont., at $1.55 per square yard. Westrumite, Limited, of Brantford, Ont., submitted a bulk tender of $7,000. Engineer, Mr. K. S. Macdonell.

Guelph, Ont.

The contract for the construction of 5,-[illegible] square yards of [illegible] was awarded to J. Conn, at 38 cents per foot, [illegible] surfacing. Westrumite, 3 inches, $1.32 per square yard.

Swift Current, Sask.

Contract A, for laying sewer and water mains, etc., was awarded to Laidlaw & Macdonald, of Fort Wililam, Ont., at $39,179. The following bids were also submitted for contract A: M. A. Pigott, Kenora, Ont., $49,737; W. Gray & Company, Winnipeg, Man., $59,000; Broley & Martin, Fernie, B.C., $71,535; McManus & Son, North Battleford, Sask., $87,457; H. G. McVean, Moose Jaw, Sask., $62,673. For contract B, the erection of disposal works, the successful tenderers were Laidlaw & Macdonald at $8,299; M. A. Pigott tendered at $11,801, and Broley & Martin at $11,137. Contracts C and E were not awarded.

Winnipeg, Man.

The tender of Cottineau & Company for building of sidewalks was accepted by the Board of Works at $1,026.40.

The contract for supplying the city with 2,000 ⅝-inch water meters has been awarded to the National Meter Company, of Chicago, for "Empire" meters at $11.75 each.

Railroads, Bridges and Wharves

Brockville, Ont.

Plans and specifications have been prepared under the direction of the Department of Public Works, Ottawa, for the construtcion of a breakwater which will extend from a point west of the Block House Island, opposite the town, to the western extremity of the old C. P. R. pier. A sum was placed in the estimates last session for this work.

Campbellton, N.B.

Tenders will be called this week for the rebuilding of the roundhouse, repair shops and station offices of the Intercolonial Railway at Campbellton. The Dominion government has set aside $250,000 for the purpose.

Edmonton, Alta.

An American company, believed to be backed by the J. J. Hill interests, is having surveys made for a line to run from the American boundary to Fort McMurray in the far North. The idea is to have this as a feeder for a fourth transcontinental road, which will be built across Canada to the north of existing lines. It is said that the company will build 100 miles of line before asking the government for the subsidy of $13,000 a mile granted to all railroad companies in Alberta.

Montreal, Que.

The G. T. R. engineers, under the direction of Chief Engineer H. G. Kelley, are still at work on plans for the elevation of the G. T. R. tracks. There are thirteen level crossings in the city and the expenditure involved is four or five million dollars. Plans for the work were to have been filed with the Railway Commission by August 1st.

New Westminster, B.C.

Approval of their plans for extensive improvements at Gilley's wharf, involving an expenditure of about $14,000, has been asked by the British Columbia Electric Railway Company. The mayor and board of works will report on the request.

It is stated that the C. N. R. are contemplating the expenditure of $3,000,000 in New Westminster and vicinity. The plans include the erection of a large docks at Port Mann, an independent track into the city of Vancouver, and the making of a tunnel half a mile or more in length from the end of the Fraser river bridge to the depot.

Oak Bay, B.C.

The Dominion Government have refused to make an appropriation for a new wharf at this place.

Ottawa, Ont.

Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, will be received until August 22nd for placing stone protection, summit level, Kelland canal. Specifications and forms of contract may be obtained at office of superintending engineer, St. Catharines, Ont.

Tenders for straightening channel at head of Lock No. 2, Welland Canal, will be received until August 22nd by L. K. Jones, secretary, Department of Railways and Canals. Plans and specifications may be seen at office of superintending engineer.

St. Catharines, Ont.

It is stated by the Railway Department that no decision has been reached by the government as to whether the Hudson Bay Railway will be rebuilt by a private company or by the government. It has been suggested that because Mackenzie & Mann are to build the sub-structure of the Saskatchewan bridge, they also will build the railway. It is pointed out, however, that Mackenzie & Mann are general contractors as well as railway builders. They tendered for both the sub-structure and the superstructure and were successful in getting the contract for the former, but not for the latter. They have no arrangement with the government.

The C. P. R. are reported to have the following plans under consideration as regards Ottawa: To electrify the old Prescott line from the Union Station to the Sussex street station; to connect the Sussex street station with the mouth of the proposed tunnel by a surface electric line; to connect the Hull electric line with the line thus formed, which would create an electric belt line.

Port Arthur, Ont.

Tenders will shortly be called for an extension of the breakwater here to cost $100,000, by the Dominion Government.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until August 31st for the construction of a breakwater at Bare Point, in the harbor of Port Arthur. Plans and specifications can be obtained at the Department, and at the offices of J. G. Sing, District Engineer, Confederation Life Building, Toronto, Ont.; E. B. Temple, District Engineer, Port Arthur, Ont., and J. L. Michaud, District Engineer, Merchants' Bank Building, Montreal.

Pelee Island, Ont.

Tenders for Pelee Island wharf extension will be received until September 12th next by R. C. Desrochers, secretary, Department of Public Works, Ottawa. Plans and specifications may be obtained at the department; at the offices of J. G. Sing, District Engineer, Confederation Life Building, Toronto; H. J. Lamb, District Engineer, London, Ont., and on application to the postmaster at Pelee Island, On.

Quebec, P. Q.

The time for receiving tenders for the Quebec bridge has been extended to October 1st. For further particulars see "Tenders and For Sale Department" of this issue.

Regina, Sask.

The route by which the G. T. P. will enter Regina has been given out. The city council is now considering a proposition of the Canadian Northern for joint passenger facilities with the G. T. P., and to make Regina the chief divisional point for their systems in Saskatchewan, with large shops and freight terminals. The Canadian Northern has already expended upwards of $300,000 on property for terminals at Regina and the company proposes the early expenditure of at least double that amount, for the establishment of the necessary equipment of its divisional point there.

St. Johns, Que.

The ratepayers have approved the construction of the St. Johns-Iberville bridge.

St. John, N.B.

Plans have been prepared for the new dry dock and ship preparing plant which the Dominion Dry Dock Company proposes to establish at Courtney Bay. The dock will be 1,000 feet long, and the whole plant of the most modern type. This is the company in which Sir Robert Perks, Harland & Wolff, the Canadian Pacific Railway, the Allan Line and the Dominion White Star Line are interested.

Shelburne, N.S.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until September 6th for the construction of a wharf at Shelburne, County of Shelburne, N.S. Plans, specification and forms of contract can be seen, and forms of tender obtained at the Department, and at the offices of Thomas J. Locke, District Engineer, Lockeport, N.S.; C. E. W. Dodwell, District Engineer, Halifax, N.S., and on application to the Postmaster at Shelburne.

Spanish Ship Bay, N.S.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until September 6th for reballasting, raising and extending the "Hartling Wharf" at Spanish Ship Bay. Plans, specifications and form of contract can be seen and forms of tender obtained at the offices of E. G. Millidge, District Engineer, Antigonish, N.S.; C. E. W. Dodwell, District Engineer, Halifax, N.S., and on application to the Postmaster at this place.

St. Leonards, N.B.

The Van Buren-St. Leonards International Bridge Commission will receive tenders at the office of the State Commissioner of Highways, at Augusta, Maine, until September 9th, 1910, for furnishing material and erection of highway bridge over the St. John river, between Van Buren, Maine, and St. Leonards, N.B. The length of bridge will be about 762 feet, between back walls, and about 2,200 cubic yards of masonry will be required. Proposals will be received separately for the masonry and for the superstructure. The masonry must be completed by December 1st, 1910, and the superstructure by April 1st, 1911. Specifications and general plan may be seen at the office of the Chief Engineer, Department of Public Works, Ottawa, Ont.; at the offices of the resident engineers, D. P. Works at Toronto, Ont., Montreal and Quebec, Que., and St. John, N.B.; or they may be obtained for one dollar on application to E. E. Greenwood, Engineer, Srowhegan, Maine.

Victoria, B.C.

The C. N. R. is negotiating with the provincial government with a view to undertaking its Vancouver Island line to Quatsino Sound.

Vancouver, B.C.

It is stated that the C. N. R. have started surveys for Port Mann, their new Pacific terminus.

Advices from Seattle, Wash., quote Jean Wolkenstein, president of the British Columbia & Alaska Railway Company, as stating that company proposed to build 800 miles of railway traversing the valley between the east and west ranges of British Columbia and extending from Vancouver to the northern British Columbia line. The line, as projected, will extend from Vancouver via Lytton and Fort George and thence north. The company also is contemplating a line into Skagway by way of Telegraph Creek and is now securing the right of way. Surveying parties are now in the field.

Wiarton, Ont.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until September 13 for an extension to the breakwater in Colpoy's Bay. Plans and specifications at the Department at Ottawa, and at the offices of J. G. Sing, District Engineer, Confederation Life Building, Toronto; H. J. Lamb, District Engineer, London, Ont.; and on application to the postmaster at Wiarton, Ont.

AWARDED.

Berlin, Ont.

Intimation has reached us from the office of the People's Railway that the contract has been awarded between Berlin and Bloomingdale, 3 miles, on the main line to Guelph, to F. W. Maxwell, of Port Hope, to be built by December. The contract has also been let westerly from Berlin to New Hamburg, a distance of about 14 miles to D. B .Campbell, Latchford, Ont., to be completed by December 30th. The Acme Construction Company are doing the grading between Bloomingdale and Guelph. This work was commenced four weeks ago. The grading will be completed between Bloomingdale and New Germany within a week's time, and the balance will be completed by the 15th of December. The distance of grading which is to be completed by December is about 29 miles. The contract has also been awarded for all the concrete work along the line, including the three large piers and two abutments for the Grand river, east of Berlin, to Thos. Robbins, of Galt, to be completed by December 1st. The company wil shortly put on a large force of engineers to survey the line from Guelph to Elora, Fergus and Arthur; and also to complete the survey from Guelph to Puslinch Lake. The company also intend to have a great deal of their line operating by July, 1911. In the year 1911, the company will complete 80 miles of railway and make extensions westerly to the lake.

Edmonton, Alta.

John Gunn & Sons, of Winnipeg, received the contract for the construction of the C. P. R. mililon-dollar high level bridge across the Saskatchewan. This bridge will be 2,800 feet long, and 156 feet wide.

Montreal, Que.

P. Perrigo, Eganville, Ont., has taken a sub-contract for grading 10 miles of roadbed for the G. T. R. in Quebec.

New Glasgow ,N.S.

The W. P. McNeill Company, of this town, have been awarded the contract for the erection of a steel bridge of 3-span of 183 feet at Florenceville, N.B.; also one of one-span of 183 feet at Kouchiboquac Village, N.B.; also one of one span of 117 feet at Little Bouctouche Mouth, N.B. Work on these will commence immediately.

New Westminster, B.C.

The contract for placing the dyking on the gulf side of Delta municipality in permanent repair has been let to H. V. Tucket, of Vancouver, and work will commence imemdiately. Teh contract calls for 30,000 yards of gravel at an average price of 85 cents per yard.

Ottawa, Ont.

The Department of Public Works has awarded the following contracts: Dredging in Miramichi Bay, N.B., to J. Poupore, of Montreal, and A. V. Loggie, approximately $100,000 each; Montmagny dredging, L. Cohen & Son, Montreal, $8,000; breakwater at Matane, N. Trudel, $5,500.

The Randolph-MacDonald Company, of Toronto, has been awarded a $10,000 contract for dredging the Cornwall canal.

The contract for the sub-structure of the bridge over the Saskatchewan river at La Pas, in connection with the Hudson's Bay Railway, has been awarded to Messrs. Mackenzie & Mann. The price is $100,000. The contract for the iron work was let some time ago to the Canada Foundry Company.

A number of contracts have just been awarded by the Department of Public Works. For dredging in Miramichi Bay, N.B., W. J. Poupore, Montreal, and A. & R. Loggie, each got a contract for $100,000 approximately. L. Cohen & Son, Montreal, will dredge at Montmagny, the total being about $8,000, while N. Trudel will build a breakwater at Matane, costing $5,500.

Port Arthur, Ont.

S. Brown, of Winnipeg, secured contract for big C. N. R. roundhouse and has started work. Solid brick and concrete foundation.

Pincher Creek, Alta.

J. A. McGuire is stated to have been awarded the contract for constructing a railroad from Pincher Creek station to Pincher Creek, and thence through the calley to Cardston.

Sault Ste. Marie, Ont.

P. Furlong, Eganville, Ont., and J. Hicks, Perth, Ont., are reported to have been awarded the contract for building the trestles and laying the steel for 80 miles of line for the Algoma Central.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

The Empire Hotel, which was partially destroyed by fire, will be rebuilt at a cost of $20,000.

Calgary, Alta.

The Methodist Church are preparing plans for a college here.

W. R. Hall has taken out a permit to erect a solid brick three-storey hotel with concrete basement. Lang & Dowler, architects.

$61,000 will be spent for new exhibition buildings.

Collingwood, Ont.

At a meeting of the city council a by-law to raise $10,000 for the erection of a new fire hall came up for consideration but was ultimately left over until plans are secured from Architect Wilson. A by-law will probably be voted on at the municipal elections.

Darlingford, Man.

Tenders addressed to R. E. Fines will be received until August 22nd for the erection of a four-room brick school building. Plans and specifications may be seen with Mr. Fines at Darlingford, or at the office of the architect, Frank Evans, Somerset Buildings, Winnipeg.

Edmonton, Alta.

Tenders addressed to John Stocks, Deputy Minister of Public Works, will be received until August 20th for supply of sash, doors and stair work for the public buildings of the provincial government. Plans, specifications and forms of tender may be had on application at Enginer's office, Department of Public Works, Edmonton, or at the branch office of the Department of Public Works, Calgary.

Fort William, Ont.

Tenders addressed to Frank Lee, secretary, West Algoma Agricultural Association, will be received until August 19th for the erection of a building on the Joint-Fair site. Plans of Carl Wirth, architect, Room 42, Murray Block.

Hood & Scott, architects, this city, are preparing plans for a new Jewish Synagogue.

A by-law will be submitted to provide for the erection of a city police station and court house building and for improvements to the city building.

Fort George, B.C.

A site has been selected for the new provincial buildings and construction will proceed immediately.

Hamilton, Ont.

The public library board has instructed A. W. Peene, architect, to prepare revised plans for the new Carnegie library.

Hatzic, B.C.

Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, B.C., will be received until August 31st for the erection of a large two-roomed school building. Plans, specifications, contract and forms of tender may be seen at offices of the Government Agent, New Westminster; R. C. Abbott, Secretary of School Board, Mission City, B.C.; and the Department of Public Works, Victoria, B.C.

Isabella, Man.

Tenders addressed to Wm. Iverach will be received until October 20th for the erection of a Presbyterian church at this place. Building to be completed by November 15 next.

Macleod, Alta.

The town council have received plans for the fair buildings to cost $10,000.

Maisonneuve, Que.

Tenders for the erection of new town hall will be received until August 17th by M. G. Ecrement, secretary-treasurer of this town. C. Dufort, architect.

Montreal, Que.

Tenders addresed to Ross & MacFarlane, architects, will be received until August 20 for the erection of Y. M. C. A. Building. Plans and specifications upon application to architects. R. C. Holden is chairman of the Y. M. C. A. Building Committee.

It is announced by the Harbor Commission that plans are being prepared for a new office building at the Montreal dock.

Meaford, Ont.

The Public School Board are asking the town council to provide $3,400 for improving the heating and lighting facilities and furnishing additional sanitary appliances for the public school building.

Marieville, Que.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until August [illegible] for the construction of a public building at this place. Plans with H. N. Lymburner, Superintendent of Public Buildings, Post Office, Montreal, at the Post Office, Marieville, and at the Department at Ottawa.

Mortlach, Sask.

The Church of England will have a building erected. A. Cooper, secretary.

North Battleford, Sask.

Plans are being prepared for a new three storey hotel here for George Graves.

North Vancouver, B.C.

Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, B.C., will be received until August 30th for erection of a large two room school building. Plans, and specifications may be seen at the office of A. Haslam, Provincial Timber Inspector, Vancouver; Mrs. E. J. Campbell, secretary to the North Star School Board, North Vancouver; and the Department of Public Works, Victoria.

Ottawa, Ont.

The Board of Control has endorsed plans for the new No. 4 fire station and tenders will be called for shortly. Architect Weeks.

Alterations costing about $6,500 will probably be made at the Protestant hospital.

Ponoka, Alta.

Tenders addressed to John Stocks, Deputy Minister of Public Works, Edmonton, Alta., will be received until August 20th for the installation of elevator and laundry equipment at the asylum building. Specications and forms of tender may be had on application at the Engineer's office, Department of Public Works, Edmonton, or at the branch office of the Department of Public Works, Calgary.

Phoenix, B.C.

The Methodist and Presbyterian churches, library, public school and other buildings, were destroyed last week in a fire which originated at the plant of the Granby Consolidated Mining & Smelting Company.

Regina, Sask.

The Evangelical Lutherans will build an academy to cost $50,000. The city council gives a grant of $8,000 in land.

Plans are being prepared by local architects for a fireproof library building to cost $40,000. J. R. Honeyman is secretary of Library Board.

Ritchot, Man.

A school will be built for the Niverville school district to cost $3,000.

Stirling, Ont.

Tenders will be received until August 20 for the erection of a five-room annex to high school building. R. F. Houston & Son, architects, Tweed, Ont.

Strathcona, Alta.

A new college for O. M. I. Order of the Catholic Church is to be erected here.

Wilson & Herald are the architects for the new school to cost $15,000.

Saskatoon, Sask.

The Bank of Hamilton have taken out a permit for a new building; brick and stone. Smith & Wilson, contractors.

St. Boniface, Man.

The Grey Nuns are building an addition, and also plan a new seminary to be built this fall.

Sherbrooke, Que.

The Protestant School Board are considering the erection of a new school house.

Toronto, Ont.

Tenders will be received up to August 19th for the various trades required in the erection of a public school near Victoria Park, for Section 13, Scarboro. Address bids to Mr. A. Essex, secretary-treasurer, corner of Queen and Blantyre avenue, Balmy Beach. Plans, specifications and all information may be obtained from Munro & Mead, architects, 86 Kingston road.

Victoria, B.C.

The Alexander Club, of Victoria, will erect a new club building in this town. Plans have not yet been drawn, but as soon as they are, tenders will be asked for and the work started forthwith.

The First Baptist Church will erect a temporary structure at the corner of Yates and Quadra streets pending the building of their new $50,000 church.

Winnipeg, Man.

The plans for the police and fire alarm signal, building were submitted to the city council recently. The estimated cost was $63,000. Friction between the police and electrical departments was responsible for having the plans sent back to committee. It is purposed now to make the structure four storeys high.

Tenders have been received for the new home for the congregation of Westminster church. The board has not met yet to discuss the tenders, but will probably deliberate on the matter at an early date.

The city has received seven tenders for the construction of two police sub-stations. They have been referred to the building inspector and will probably be let this week.

The Board of Control invites competitive plans from local arcihtects until September 12th for the proposed tubercular hospital. M. Peterson, secretary.

It is proposed to build a new hospital in North Winnipeg at a total cost of $150,000. The special committee behind the scheme includes Alderman Potter and Dr. Walters.

Competitive plans are to be called for the new tubercular hospital. The building must be capable of housing 100 patients and must be of fireproof construction, to cost not more than $75,000.

Woodstock, Ont.

Plans for the new proposed city hall, prepared by Chapman & McGriffin, architects, Toronto, have been approved by the special committee of the city council.

Watrous, Sask.

Plans are under way for building three large sanitariums at Manitou Lake.

Wolseley, Sask.

A by-law authorizing the erection of a $10,000 four-room school was passed recently.

Weston, Ont.

A site has been selected for the erection of a new building for the Weston High School.

AWARDED.

Brantford, Ont.

The following contracts were awarded in connection with the Ryerson and King Edward schools: Plumbing and gas fitting, T. J. Minnis & Company, $4,400; heating, T. A. Cowan & Company, $7,600; electric wiring, F. Webster, $100.

London, Ont.

The contract for reshingling the roof at the main building at the fair grounds was awarded to the Preston Company, at $975.

Montreal, Que.

The Catholic School Board have taken out a permit for the erection of a new school on Visitation street, to cost $105,000.

North Vancouver, B.C.

E. Dowie has the contract for a new school to cost $2,575.

Outlook, Sask.

Alex. Johnston secured the contract for the Outlook school at $17,500.

St. Joseph, Que.

The School Commissioners of the town of St. Joseph have awarded the contract for the erection of their new school to Liniere Vachon, at $15,000.

Saskatoon, Sask.

Ramsdale & Robinson secured the contract for the new Methodist church.

Toronto, Ont.

Tenders will be received until August 19 for the various trades required in the erection of a public school near Victoria Park, for section 13, Scarboro, marked Tender for School, and addressed to Mr. A. Essex, secretary-treasurer, corner of Queen and Blantyre, Balmy Beach. Plans, specifications and all information may be obtained from Munro & Mead, architects, 86 Kingston road.

Virden, Man.

Geo. Harris was awarded the contract for building the new Parish Hall. Virden brick will be used.

The contract for the erection of a collegiate institute was awarded to W. T. Mauser, a local man, at $18,765. Other tenders were: Geo. Harris, Virden, $20,237, and W. H. Piggott & Son, Kenora, at $24,400.

Vancouver, B.C.

The Masons of Grandview have decided to erect a temple and have purchased a site at the corner of Salsbury drive and First avenue, where it is intended to erect a public hall with commodious lodge rooms.

Winnipeg, Man.

The contract for the brick, masonry and structural steel work of the new children's hospital building was awarded to W. J. Davidson. The new building will be fireproof and will cost $60,000.

Waskada, Man.

D. McLean secured the contract to erect the new municipal building.

Residences

Brandon, Man.

J. Wyman has secured permits to erect two residences to cost $3,800 each.

Grenfell, Sask.

Hohn's livery stable and residence and the blacksmith shop owned by Fleming Bros., were destroyed by fire last week at a loss of $8,000.

Saskatoon, Sask.

F. A. Blain will erect a $9,000 residence, solid brick and stone.

Victoria, B.C.

Plans have been awarded to Mr. W. Rochfort by a local syndicate for the erection of a large apartment block on the southeast corner of Vancouver and Coutte streets. It is the intention of the syndicate to start construction work as soon as possible.

Mr. W. S. Drewery, this city, will build a new residence at a cost of $6,000.

Wainwright, Alta.

E. T. Stimpson, architect, is preparing plans for a residence for Councillor Logan.

Winnipeg, Man.

P. C. Samwell is completing plans for a three-storey apartment block to be built on Broadway for Kirkpatrick & Smith.

Business Buildings and Industrial Plants

Arnprior, Ont.

The Dominion Explosives, Limited, contemplate rebuilding their works at Sand Point, which were destroyed by fire last month.

Brandon, Man.

The G.T.P. has taken out a building permit to construct new freight offices on Isabella street. The cost is $7,000. A permit has also been issued to the city for additions to the city offices on Rice street, also at a cost of $7,000.

The contract for the C.N.R. hotel here will be let this week.

Brantford, Ont.

The Verity Plow Company will make extensions to its local works at an outlay of $60,000.

Bryanston, Ont.

A. J. Burnett's general store was destroyed by fire last week at a loss of $10,000.

Brockville, Ont.

The Merrill Block, occupied by S. H. Post, C. E. Johnston & Co., and others, was damaged by fire to the extent of $8,000.

Calgary, Alta.

The Land & Agricultural Company of Canada are to build a large office building at Vernon, B.C. T. E. Crowell, of Vernon, has the contract. It will be of reinforced concrete.

Fort Frances, Ont.

The sawmills of the Fort Frances Lumber Company were destroyed by fire last week at a loss of $60,000.

Fort Wililam, Ont.

According to a recent dispatch from this city, a contract for a large coal handling plant for the Fort William Coal Dock Company, of this city, has been let, and construction will be commenced at once. The first unit of the plant, which will be completed in less than two months, will cost about $170,000. The unloading capacity will be 4,000 tons in ten hours.

Hood & Scott, architects, this city, have plans for a $15,000 apartment block for John Garrity, real estate agent, this city.

Galt, Ont.

A committee comprised of Mayor McLellan, C. J. Shurly, David Anderson, A. J. Oliver, and others, has been appointed to consider ways and means for the erection of a consumptive sanitorium in the county of Waterloo.

Montreal, Que.

It is reported that two prominent English firms will shortly locate branches in Montreal. The George Anderson Company, manufacturers of cranes and stove machinery, will build a large factory here at once, and expect to occupy it by May 1st next. They also expect to build shops in some western Ontario town. The second concern is the Cleveland Bridge & Engineering Company of Darlington, England, which will locate shops in Montreal. This firm has tendered for the Quebec bridge and in the event of securing the contract will establish large plants at both Montreal and Quebec.

Tenders for office building on the wharf at section 15 will be received until August 30th by David Seath, secretary treasurer of the Harbor Commission. Separate tenders for plumbing and heating. Plans of F. W. Cowie, chief engineer, Harbor Commissioner's office, city.

The city building department has granted of permits for the construction of three factories in the city representing a total expenditure of $41,500. The Canada Sugar Refining Company is building a new factory on St. Patrick street at a cost of $18,000; the Pipper Light and Power Company is constructing a similar building on St. Remi street, St. Henri, also at a cost of $18,000, and James Robertson has a permit to put up a factory on Shannon street costing $5,500.

At an early date extensive alterations will be started on the premises of the Shedden Forwarding Company, at Victoria Square.

Norway Bay,, Que.

An Arnprior despatch states that a company composed of Ottawa, Renfrew and Arnprior capitalists has been formed with the intention of erecting a large hotel at this point.

Niagara Falls, Ont.

The Hawes-von Gal Hat Co., of Danbury, Conn., is reported to have decided to establish a Canadian branch and will erect a factory at Clifton avenue and Queen street, Niagara Falls.

Owen Sound, Ont.

J. A .Minchener, of Stratford, Ont., proposes to establish a furniture factory in this town. A by-law to raise a loan of $20,000 will be submitted to the ratepayers on August 27th.

Peterborough, Ont.

The Peterborough Canoe Company will enlarge their plant at an estimated cost of $10,000.

Port Arthur, Ont.

The secretary of the Board of Trade states that six factories costing over $700,000 will be put up this year here.

Rainy River, Ont.

The Rainy River Lumber Company's lumber sheds and contents were burned down on August 9th at a loss of $100,000.

Regina, Sask.

Local tenders have been received by the city engineer for erection of an office building, cottage and greenhouse. L. A. Johnston, city engineer.

Pat Burns, of Calgary, is to have a large abattoir and pork packing plant erected in Regina. Plans will not be ready until the fall.

St. Croix, Que.

The Church of Our Lady of the Sacred Heart was struck by lightning and destroyed by fire at a loss of $25,000.

Truro, N.S.

Mr. Geldert, grocer, sustained loss by fire on house and shop to the extent of $2,000.

Toronto, Ont.

The City Architect has issued permits for the construction of a four-storey store and office building at the corner of Yonge and Richmond streets to cost $72,000, and for a $20,000 residence on Roxborough street for Mr. W. P. Murray.

Robins, Limited, have purchased the corner of Richmond and Victoria streets, and will erect an office building thereon.

S. F. McKinnon & Company are planning the erection of a large warehouse.

W. J. McGuire, Limited, have withdrawn their tender for heating the palm house at the Allan Gardens.

The Penfold Varnish Company were refused permission to build a factory on Macaulay avenue.

Vancouver, B.C.

The directors of the Strathcona Institute have $25,000 on hand towards the erection of their new building and hope to commence operations at an early date.

Victoria, B.C.

Work will commence at once on the erection of the new business block which Mr. A. E. Todd will erect at the corner of Cook and Fort streets. The structure will be one storey in height with basement and will be occupied by nine stores. Adjoining will be erected a green house. The cost of the building will be $20,000. G. C. Mesher & Company are the architects and contractors.

In connection with a report that the Swift Packing Company, of Chicago, was about to commence operations in this city, Mr. J. Y. Griffin, who represents Swifts in Vancouver, states that he is unaware of any such intention on the part of the big meat packing establishment. In connection with the report it is stated on good authority that Swifts have secured options on desirable sites for offices and warehouses.

Welland, Ont.

The Hamilton Tube Company and the Chapman-Holden Knitting Company, both of Hamilton, are considering the establishment of plants in this city.

Winnipeg, Man.

Competitive plans are to be called for the erection of a tubercular hospital for this city. $75,000 has been voted for this building.

J. D. McArthur, contractor for the National Transcontinental Railway, it is stated, will build a warehouse costing $51,000, on McDermott avenue, between King and Princess streets.

It is reported that J. B. Brown, printer, will build a business block on Vaughan street, near Portage avenue.

Regina, Sask.

The King Edward block at St. James' was destroyed by fire last week at a loss of $10,000. The losers are N. McDonald, A. J. McDonald and others.

Christ Church site, corner of King and Henry streets, has been sold, and a Montreal firm have secured the site through E. M. Counsell, their agent here. A large warehouse, covering the entire space, will be erected.

Tenders for construction of new elevators will be received by the Engineering Department of the Manitoba Elevator Commission up to August 20th. Plans, specifications and form of tender may be obtained at the office of the Commission, 279 Garry street.

According to a Winnipeg despatch, a palatial hotel two hundred feet square, of nearly five hundred rooms, to cost nearly two mililons, will be built at once by the G. T. P. in Winnipeg. President Hayes made the announcement, adding that representatives of Ross & MacFarlane, the Montreal architects, are now in Winnipeg preparing the plans. Work is to be commenced as soon as the frost is out of the ground next spring.

Semmens & Evel have commenced work on their cracker factory to be located on Ross avenue. It will be four storeys high and the estimated cost is $40,000. Jas. Chisholm & Son, architects.

Woodstock, Ont.

It is reported that the Hutchison Fibre Board Folding Box Company, Limited, of

(Continued on page 29)

Tenders and For Sale Department

Department of Railways and Canals

QUEBEC BRIDGE

Tenders for Superstructure

Notice to Contractors

Extension of Time for Receiving Tenders

The time for receiving tenders for the superstructure for the Quebec Bridge advertised to be received up to the 1ST OF SEPTEMBER, 1910, is hereby extended for one month, viz.: up to the first of October, 1910.

By Order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 9th August, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 35

Tenders
for
Electric Lighting

Sealed tenders addressed to the undersigned and marked "Tenders for Electric Lighting" will be received at the office of the City Clerk, Charlottetown, Prince Edward Island, until 12 o'clock noon on SATURDAY, THE 10TH DAY OF SEPTEMBER, 1910, for supplying the City of Charlottetown with Electric Light for Street and Commercial purposes. Tenders to state price and illuminating capacity per lamp for street light, and rate per kilowatt hour for commercial lighting.

The lowest or any tender not necessarily accepted.

Further information can be obtained by applying to the office of the CONTRACT RECORD, 504 Confederation Life Building, Toronto, or to

W. W. CLARKE,
City Clerk.

Charlottetown, P.E.I., July 20th, 1910. 34

Tenders Wanted

Tenders will be received by the undersigned until noon of SATURDAY, THE THIRD DAY OF SEPTEMBER, 1910, for the construction of the Drainage Work in the Township of Mountain, in the County of Dundas, known as the Van Camp Creek Drain. The profile of the said drainage work and the plans and specifications in connection therewith may be seen during business hours at the office of the undersigned clerk.

Tenderers will be required to state the price per cubic yard for which they will undertake the work of excavation and also the bulk sum for which they will construct the work (farm and road bridges excepted). Each tenderer must deposit with his order a certified cheque payable to the order of the Corporation of the Township of Mountain for five per cent. of the amount of his tender, which will be returned in case the proposal of the party tendering is not accepted, or in case of the acceptance of the proposition, if the tenderer within five days after being notified so to do by the township's solicitor, refuses or neglects to enter into an agreement for the construction of the work with two sufficient sureties.

Forms of tender may be obtained at the office of the Township Clerk.

Dated this 8th day of August, A.D. 1910.

HUGH MARTIN,
Township Clerk.

Hallville, Ont. 33

Town of Dauphin

Province of Manitoba

Water Works and Sewerage
Notice to Contractors

Sealed tenders will be received by the Secretary-Treasurer until 8 p.m. on THURSDAY, SEPTEMBER 1ST, 1910, for the following:

Contract "A"—Labor, laying about six miles of water pipes and sewers; sub-divided into two sections.

Contract "D"—Furnishing cast iron water pipe and speical castings.

Contract "E"—Furnishing gate valves for fire hydrants, etc.

Contract "M"—Labor and materials for ten miles of gravity main; sub-divided into three sections.

Contract "R"—Constructing concrete reservoir.

Contract "S"—Furnishing sewer pipes.

Contract "W"—Furnishing wooden stave pipe.

Plans, specifications, etc., may be seen at the Town Hall, Dauphin, or at Engineer's offices, Winnipeg and Toronto.

No tender necessarily accepted.

R. C. SPARLING, Esq.,
Mayor. J. A. CAMPBELL, ESQ.,
J. W. JOHNSTON, Esq., Chairman.
Secretary-Treasurer. CHIPMAN & POWER,
34 Engineers.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Breakwater at Bare Point, Port Arthur, Ont.," will be received at this office until 4.00 p.m., on WEDNESDAY, AUGUST 31ST, 1910, for the construction of a breakwater at Bare Point, in the Harbor of Port Arthur, Electoral District of Thunder Bay and Rainy River, Ont.

Plans, specifications and form of contract can be seen and forms of tender obtained at this Department and at the offices of J. G. Sing, Esq., District Engineer, Confederation Life Building, Toronto, Ont., E. B. Temple, Esq., District Engineer, Port Arthur, Ont., and J. L. Michaud, Esq., District Engineer, Merchants Bank Building, St. James Street, Montreal, Que.

Persons tendering are notified that tenders will not be considered unles made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation and the place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of Public Works for the sum of forty-five thousand ($45,000.00) dollars which will be forfeited if the person tendering declines to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, August 10th, 1910.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 34

Tenders for
Ties and Rails
for Construction of Industrial Tracks on East Bank of the Don

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, SEPTEMBER 6TH, 1910, for the following materials: 20,800 feet of partly worn or re-laying rail; 400 oak ties and 4,800 cedar ties.

Envelopes containing tenders must be plainly marked o ntheotieudsETAOIN SHRDLUU CMFI marked on the outside as to contents.

Specifications may be seen at the office of the City Engineer, Toronto.

The tenderers shall submit with their tender the names of two personal sureties (approved by the City Treasurer), not members of the City Council or officers of the Corporation of the City of Toronto, or, in lieu of said sureties, the bond of a Guarantee Company approved of as aforesaid.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, August 6th, 1910. 33

City of Peterboro

Province of Ontario

Notice to Contractors

Sealed tenders will be received by the City Clerk until 8 p.m. on THURSDAY, SEPTEMBER 1ST, 1910, for the following works:

Contract "A"—1. Laying 2,000 feet Sanitary Sewer.
2. Laying 4,200 feet Storm Drains.
Contract "G"—Electrically operated Air Compressor and Ejectors.
Contract "P"—Sewage Pumping Station.
Contract "S"—Tile Sewer Pipes 30-inch to 8-inch.

Plans and specifications, etc., may be seen at the City Engineer's office, Peterboro, or at the office of Consulting Engineers, Toronto.

ROBERT HICKS, Esq.,
Board of Works.
T. A. S. HAY, Esq., C.E.,
City Engineer.
R. S. ARMSTRONG, Esq.,
City Clerk.
CHIPMAN & POWER,
Engineers, Toronto.

Miscellaneous

Advertisements nnder this heading two cents a word per insertion.

CONTRACTOR'S OUTFIT FOR SALE—Six Wheeler, No. 3, concrete line plant, nearly new. Owner going into another line of business. Joseph Patterson, Box 114, St. Marys, Ontario. 35

Hydro-Electric Power Commission of Ontario

Tenders for Port Credit Transformer Station

Tenders will be received up to 5 p.m. MONDAY, AUGUST 29TH, 1910, for the construction of a Transformer Station Building near Port Credit, acording to drawings and specifications to be obtained at the offices of the Commission, Continental Life Building, Toronto, on or after Tuesday, August 16th, 1910.

Separate tenders for structural steel work will receive consideration.

A certified cheque for five per cent. of the amount tendered must accompany each tender.

The lowest or any tender not necessarily accepted.

Tenders must be sealed and addressed to Hon. Adam Beck, Chairman, Hydro-Electric Power Commission, Continental Life Building, Toronto, and marked ''Tender for Port Credit Transformer Station.''

Newspapers inserting this advertisement without authority will not be paid for same. 33

Town of Estevan

Province of Saskatchewan

Electric Lighting and Sewerage

Sealed tenders will be received by the Secretary-Treasurer until 8 p.m. on WEDNESDAY, AUGUST 24TH, 1910, for the following works:

Contract ''A''—Pipe-laying on Storm Sewers.
Contract ''B''—Power House.
Contract ''H''—Two Return Tubular Boilers.
Contract ''J''—High Speed Steam Engine.
Contract ''K''—Electric Lighting System.
Contract ''S''—Sewer Pipe.

Plans and specifications may be seen at the office of the engineers, Winnipeg, and Toronto, and at the Town Hall, Estevan.

J. G. HASTINGS, ESQ.,
Mayor, Estevan, Sask.

L. A. DUNCAN, ESQ.,
Secretary-treasurer,
Estevan, Sask.

CHIPMAN & POWER, Engineers,
Winnipeg and Toronto.

33

Business Buildings and Industrial Plants

(Continued from page 27)

Muskegon, Mich., will locate here, the city furnishing factory and site.

Negotiations are said to be nearing completion for the establishment of a steel manufacturing concern here.

The publicity committee report that an American concern will establish a branch here to be known as the Canadian Linderman Machine Company with a capitalization of $105,000.

Windsor, Ont.

The ratepayers have approved the by-law to exempt from taxation the Windsor Shirt Company for its new plant here.

Wynyard, Sask.

The Northern Elevator Company have secured a site here and will build at once. Another elevator company is also locating a site.

The Toronto Type Foundry have secured a site on which to erect a $10,000 solid brick building.

Wadena, Sask.

Richardson & Company are erecting an elevator here. The British North American Elevator Company will also build at once.

AWARDED.

Brandon, Man.

The contract for a seven-storey hotel for the Canadian Northern here was awarded to Thomas Kelly & Sons, Winnipeg.

Wm. Bell secured the contract to erect the Cockshutt Plow Company's warehouse, 85 x 120 feet, to cost $25,800. Another building may also be erected this fall. J. Inkster is manager.

Halifax, N.S.

The Halifax Cold Storage Company have awarded a contract for erection of a new warehouse building on Lower Water street to L. B. Fader, and H. R. Silver & Company, and are having a storehouse erected on Upper Water street.

Winnipeg, Man.

J. H. G. Russell, architect, McArthur Building, has awarded contracts aggregating $45,000 for a new four-storey brick factory of mill construction for Stabart Sons & Company, Winnipeg, as follows:—Wm. Carter, masonry, plastering, carpentry, sheet metal work and roofing; Charles E. Gate & Sons, plumbing and heating; Taylor Painting Company, painting.

Victoria, B.C.

The Westholme Lumber Company, of this city, have obtained the contract at $51,000 for the erection of the Ladies' Club building to be erected by the Alexandra House Committee. D. C. Frame, architect.

Power Plants, Electricity and Telephones

Blyth, Ont.

We are informed that the Blyth electric light plant was taken over by the Molson Bank, of London, Ont., June 1st, and is for sale, together with a sawmill.

Brockville, Ont.

The Brockville Light & Power Department has rejected the bids for the construction of the new power house adjoining the pumping station for the purpose of combining the two plants, owing to the bids being too high, and will do the work by day labor.

Bracebridge, Ont.

The towns of Bracebridge and Huntsville, Ont., have sent representatives to confer with Hon. Frank Cochrane, Minister of Lands, Forests and Mines, in reference to the High Falls water power. The town of Bracebridge has a lease to High Falls water power with development privileges, but, acording to the municipality of Huntsville, has neglected to utilize its privilege, and the town of Huntsville is anxious to obtain the right to develop the power. The government has promised to look into the matter.

Cobalt, Ont.

A. Ferland, Charles A. Richardson, W. C. Chambers, A. J. Burdett and W. A. Gordon have been granted permission by the Government to build a railway into Porcupine as a feeder to the Temiskaming & Northern Ontario Railroad. The proposed rail way will be about 40 miles in length and will be operated by electricity. Power will be obtained from High Falls on the Mattagami river, for which surveys are now being made.

Charlottetown, P.E.I.

Sealed tenders will be received at the office of W. W. Clarke, city clerk, Charlottetown, until September 10th for supplying electricity for lighting the streets of Charlottetown and for commercial purposes. Bidders are to state price and illuminating capacity per lamp for street lamps and rate per k.w. hour for commercial lighting. For further information apply to the city clerk.

Edmonton, Alta.

Plans have been submitted by City Engineer Latournel for the east end extensions of the street railway system. It is understood that bids will be called for immediately.

Lanark, Ont.

It is reported that T. B. Caldwell, of Lanark, has purchased the water power at Playfair, Ont., which he proposes to develop and transmit to Lanark to operate his factory. It is estimated that 500 h.p. can be developed.

Moosomin, Man.

Tenders addressed to J. E. Easton will be received until August 23rd for building 34 miles of telephone line.

Ottawa, Ont.

The Ottawa Electric Light, Heat & Power Company has been granted a permit to construct a sub-station on Slater street, at a cost of $18,000.

St. Catharines, Ont.

The ratepayers on July 29th voted in favor of the by-law granting the Ontario Power Company, of Niagara Falls, Ont., a franchise to furnish electricity in St. Catharines.

Toronto, Ont.

Tenders will be received up to August 29th for the construction of a transformer station building, near Port Credit, according to drawings and specifications to be obtained at the offices of the Commission, Continental Life Building, Toronto. Separate tenders for structural steel work will receive consideration. Tenders must be addressed to Hon. Adam Beck, Chairman of Hydro-Electric Power Commission, Continental Life Building, Toronto.

Winnipeg, Man.

Tenders addressed to the Chairman of the Board of Control and marked on the envelope ''City of Winnipeg Electrical Distribution System, Tender for Cable,'' will be received by M. Peterson, secretary of Board of Control, until September 1st for the manufacture, delivery and installation 46,000 feet of thirteen thousand volt, three-core cable. Copies of the specifications and form of tender may be obtained at the power engineer's office, Carnegie Library building, Winnipeg. These specifications may also be examined at the offices of Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto.

AWARDED.

Belleville, Ont.

The contract for the electric plant for the city pump house has been awarded to the Canadian General Electric Company at $2,660.

Galt, Ont.

The town council, in addition to awarding the contract for the step-down transformers for hydro-electric power to the Packard Electrical Company, have also placed an order with the same company for all of the service transformers to be used in distributing the power in Galt. The step-down transformers are composed of three 150 k.w. units. The service transformers total about 500 k.w., made up of 60 units, varying in size from three 20 k.w.

London, Ont.

The city has awarded a contract to the Packard Electric Company for all the service transformers required for distribution of hydro-electric power in London.

New Hamburg, Ont.

The Packard Electrical Company have been awarded the contract for the step-down transformers for hydro-electric power for this town. The step down transformers are composed of three 75 k.w. units. The service transformers total about 200 kilowatts make up of 13 units varying in size from three 20 k.w.. E. B. Merrill is consulting engineer.

Stratford, Ont.

The municipality of Stratford is reported to have placed an order with the John Forman Company, of Montreal, Que., for 800 75-watt tungsten street lamps.

Sherbrooke, Que.

The Sherbrooke Street Railway Company has awarded the contract for the construction of its power house in Sherbrooke to the Bishop Construction Company, of Montreal, Que. The Jenckes Machine Company, Limited, of Sherbrooke, has the contract for furnishing hydraulic machinery, and the Canadian General Electric Company for electrical equipment. About 1,250 horsepower will be developed. Ross & Holgate, of Montreal, Que., are consulting engineers.

Vancouver, B.C.

The Electrical Construction Company has received the contract for the installing of ornamental street lighting, at $15,940. The contract for lamp standards was let to the Ross and Howard Iron Works, at $45 each. Other bidders for material, etc., were: The Hinton Electrical Company, at $17,625; Cope & Son, $21,875; for lamp standards, The Vancouver Engineering Works, Limited, at $49 each.

Miscellaneous

Hamilton, Ont.

Recent building permits include: Ed. New, two brick dwellings, Sophia street, near King, $2,500; F. J. Rastrick & Sons, brick dwelling, Aberdeen avenue and Hess street, for Mrs. John Calder, $3,800.

Montreal, Que.

Tenders addressed to L. N. Senecal, secretary, Board of Commissioners, will be received until September 12th for supply of steam fire engine. Full particulars and specifications upon application.

North Vancouver, B.C.

Voting took place last week on six bylaws. Of these three were for the purpose of enabling the city to raise loans for the purchase of school sites, the fourth to raise $31,120 for park and other purposes, the fifth to obtain powers to dispose of an unsuitable school site, and the sixth to obtain a loan of $26,000 to carry out sewerage work on Lonsdale avenue. All the by-laws were approved of, except that relating to Lonsdale sewerage, which was defeated.

Ottawa, Ont.

Tenders addressed to R .C. Desrochers, secretary, Department of Public Works, will be received until September 12th for the construction of a one yard dipper dredge for Prince Edward Island. Plans, specifications, and form of contract can be obtained at the Department, and at the offices of C. E. W. Dodwell, District Engineer, Halifax, N.S.; E. T. P. Shewen, District Engineer, St. John, N.B.; J. B. Hegan, District Engineer, Charlottetown, P.E.I.; J. G. Sing, District Engineer, Confederation Life Building, Toronto, Ont., and J. T. Michaud, District Engineer, Merchants Bank Building, St. James street, Montreal, Que.

Recent building permits include: W. A. and J. B. Lamb, brick addition to warehouse, Queen street, $9,000; B. P. Dewar, brick addition to dwelling, Wilbrod street, $3,000; Wm. Fields, brick veneer dwelling, Sweetland avenue, $2,500; N. D. Porter, alterations and solid brick addition to dwelling, Somerset street, $8,500.

Toronto, Ont.

Recent building permits include: Austin Construction Co., pair semi-detached 2-sty. and attic brick dwellings, Binscarth road, $6,000; J. E. Peterkin, pair semi-detached 2-sty. brick dwellings, Symington, $4,000; Wm. Cayea, 2 detached 2-sty. brick dwellings, 115-117 Sorauren, $5,000; H. Watkinson, 3 attached 2½-sty. brick dwellings, Hook avenue, $7,000; Weismiller & MacKenzie Bros., 3 detached 2-sty. brick dwellings, near Roncesvalles, West Marion, $9,000; Garfunkel & Goldstein, pair semi-detached 2½-sty. brick dwellings, corner Baldwin and Augusta, $8,000; D. A. Williams, 2-sty. brick dwelling, Westminster, $4,000; C. D. Easton, pair semi-detached 2-sty. brick dwelings, Prospect, $4,000; A. Bollard, 2 detached 2-sty. brick dwellings, Binscarth road, $10,800; W. S. Grimshaw, 6 attached 3-sty. brick stores and dwellings, 954-964 College street, $20,000; W. B. Galbraith, one 2-sty. and one 2½-sty. brick dwellings, near Highland, Glen road, $8,000; H. W. Campbell, 2½-sty. brick dwelling, Annette street, $4,900; Toronto Auto Garage & Motor Co., 2-sty. brick and steel garage, 21 Dupont street, $20,000; Separate School Board, 2-sty. brick addition to school, Bolton avenue, $9,000; Hugh McWilliams, 2 pair semi-detached 2-sty. brick dwellings, St. Helens avenue, $11,000; E. Stone, pair semi detached 2-sty. brick dwellings, Shaw street, $4,000 J. H. Lennox, 2 pair semi-detached 2-sty. brick dwellings, Hartford, $8,000; J. J. Walsh, 4 detached 2½-sty. brick dwellings, Starr avenue, $10,000; Geo. T. Lea, 2-sty. brick dwelling, near Conduit, Woodville, $4,000; R. O. Dickson, pair semi-detached 2-storey and attic brick dwellings, corner Empress and Starr, $4,400; J. J. Tracy, pair semi-detached 2-sty. brick dwellings, near Bloor, Lansdowne, $4,600; Mr. Goldstein, pair semi-detached 2½-sty. brick dwellings, Esther street, $4,600; Miss Wilheim, pair semi-detached 2½-sty. brick dwelling, Carlaw avenue, $4,000; J. H. Stanford (in trust), 3 pair semi-detached 2-sty. brick dwellings, Bathurst, $12,000; Mrs. S. Armitage, 2-sty. brick dwelling, Sunnyside & Geoffrey, $4,000; Nasmith Co., Ltd., 2-sty. brick factory and stables, Duchess street, John Morrison, 4-sty. brick apartments, Jarvis street, $20,000; Ambrose Kent, alterations to store, near Yonge, on Richmond street, $5,000; Dr. Hamill, 3 attached 2-sty. and attic brick dwellings, near Medcalfe, Salisbury, $6,000; H. L. Hees, 2-sty. and attic brick dwelling, near Lowther, St. George, $17,000; R. Millichamp, 2½-sty. brick dwelling, corner Dunvegan and Heath, $9,600; Robert Simpson Co., 3-sty. concrete and steel waggon storage and harness shop, Dalhousie street, $53,000; J. Gibson, pair semi-detached 2-sty. brick dwellings, near Wallace, Lansdowne, $4,500; Elliott Mfg. Co., 1-sty. brick and steel warehouse, Cherry street south, $5,000; Ideal Women's Ware Co., additional storey to factory, King street west, $15,000; Canada Linseed Oil Co., 3-sty. brick and concrete oil mills, Sorauren avenue, $35,000; Davis & Moore, pair semi-detached 2-sty. brick dwelling, Perth avenue, $4,500; Wm. Priest, 3 pair semi-detached 2-sty. and one detached 2-sty. brick dwellings, near Wallace, Symington, $10,000; Michie & Co., 2-sty. brick stable, 40 Hayter street, $12,500; H. W. Macdonald, 3-sty. birck bank, store and lodge rooms, corner Bloor and St. Clarens avenue, $14,000; Nelson & Temple, pair semi-detached 2½-sty. brick dwellings, corner Dewson & Havelock, $4,500; J. B. Reid, 2½-sty. brick dwelling, corner Elm and Sherbourne, $10,000; Dr. J. D. Webster, 2½-sty. brick dwelling, 907 College street, $9,000; Roberts Bros., pair semi-detached 2½-sty. brick dwellings, near Wallace, on Symington, $4,500; R. H. Graham, 3 attached 2-sty. brick stores and dwellings, 1227, 1229 and 1231 Bloor street west, $6,600; P. Shulman, alterations and additions to pair stores, near Bathurst, Queen, $6,500; W. P. Murray, 2½-sty. brick dwelling, near Whitney avenue, East Roxboro, $20,000; Hobberlin Bros., 4-sty. brick office and show rooms, corner Yonge and Richmond, $72,000; Albert Breckon, pair semi-detached 2-sty. brick dwelling, near Queen, Booth, $5,000; F. H. B. Lyon, 2½-sty. brick dwelling, near Beech, Balsam, $5,000; F. W. J. Hill, 3 attached 2-sty. brick dwellings, near Hickson, Brock, $6,000.

Victoria, B.C.

Recent building permits include: Miss M. Jones, dwelling on Rockland avenue, to cost $6,750; Ernest McDonald, dwelling on Fisguard street, to cost $2,850; A. E. Todd, for the erection of a block on the corner of Cook and Fort street, $20,000.

Vancouver, B.C.

Recent building permits include:—Seventh Avenue Methodist Church, 1826 Seventh avenue east, $5,000; All Saints' Church, 128 Victoria drive, $2,900; Vancouver Breweries, addition to Waverley hotel, $8,500; C. P. R., 1725 Eleventh avenue west, $3,550; P. Torrance, 926 Fourteenth avenue west, $3,000; G. Simpson 1924 Charles street, $2,500; addition to the school corner of Broadway and Clark drive, $50,000; new school, corner Charles street, $26,000; L. Wett, 895 Granville street, $5,000; A. Munro & Son, 2528 Woodland, four houses, $10,000; J. B. Arthur, dwelling, $3,500; W. Parsons, frame house, $3,500; National Theatre Co., Hastings street, $15,000; A. Knight, 2835 Spruce street, $5,000; J. Tarleton, 757 Tenth avenue east, $2,500; A. Farmer, 2139 Victoria drive, 3 houses $6,000; A. Knight, 2847 Spruce street, $6,000.

Winnipeg, Man.

The Board of Control are considering the erection of a municipal gas plant. Plans are being prepared by the City Engineer. The by-law authorizing the expenditure of $600,000 for civic gas works has already been passed.

Extensions to the city's high pressure protection system costing over $200,000 will be carried out. The city will also start a salvage corps for fire work. This initial cost will be $24,258.

AWARDED.

Minnedosa, Man.

For spillway and intake structures for a dam the Minnedosa Power Company awarded a contract to A. Stewart & Company, Winnipeg, at $15,000. Other prices were: $24,355 and $19,500.

Ottawa, Ont.

The Northern Electric & Manufacturing Company, Montreal, have been awarded contract for supply of five Gamewell Standard "Excelsior" fire alarm boxes at $100 a box, f.o.b. Ottawa.

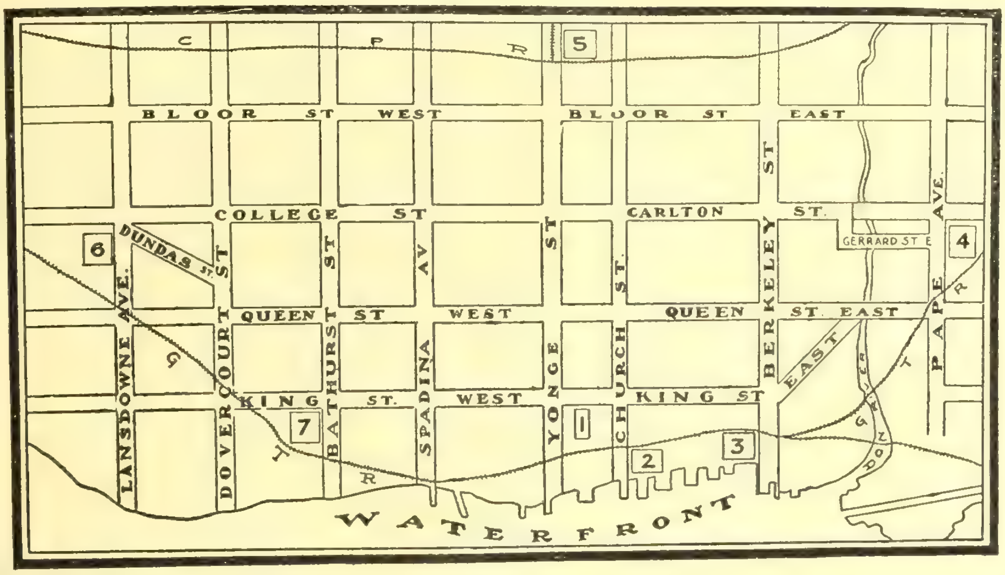
Walkerton, Ont.

For supplying cement to the town the lowest bid was from S. W. Vogan at $1.75 per barrel delivered. He was awarded the contract. C. J. Schnurr tendered at $1.77 and J. J. Zettler at $1.77½.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5

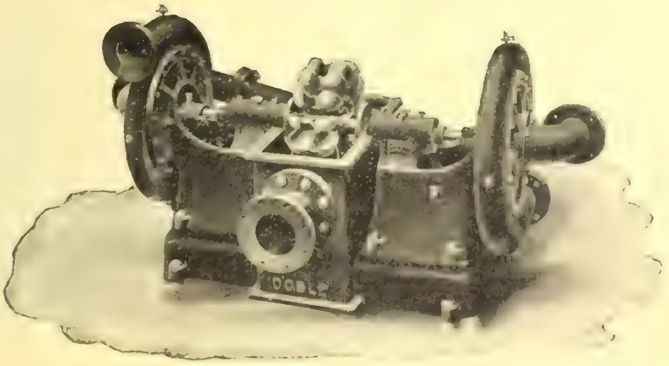


No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WATERWORKS PUMPING PLANTS



TWO OF OUR WORTHINGTON CENTRIFUGAL PUMPS HAVING A JOINT CAPACITY OF HALF-A-MILLION GALLONS DAILY AGAINST A PRESSURE OF 72 LBS. AT ST. JEROME, QUE.

DRIVEN BY ONE OF OUR DOBLE WHEELS UNDER A HEAD OF 110 FT. OF WATER. COVERING REMOVED TO SHOW THE PATENTED ELLIPSOIDAL BUCKETS.

DESCRIPTIVE LITERATURE ON APPLICATION

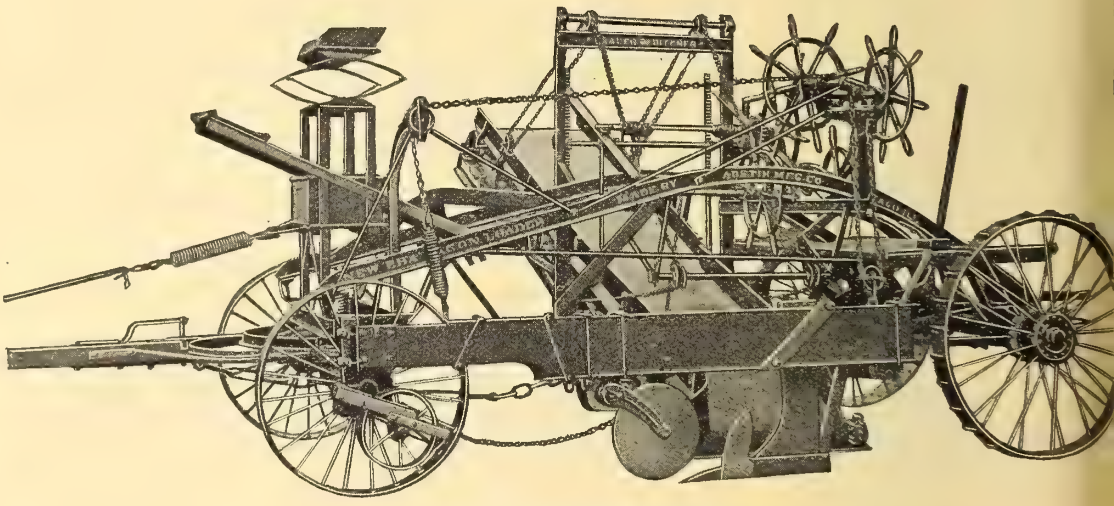
WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

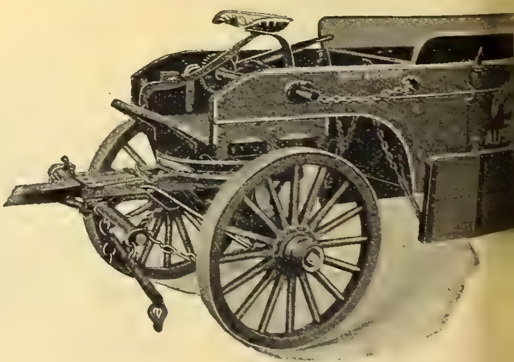
Elevating Graders

for Railroad Grading, Irrigation Work, Municipa
Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment



Austin Dump Wagon

Head Offices and Warehouses:

Montreal

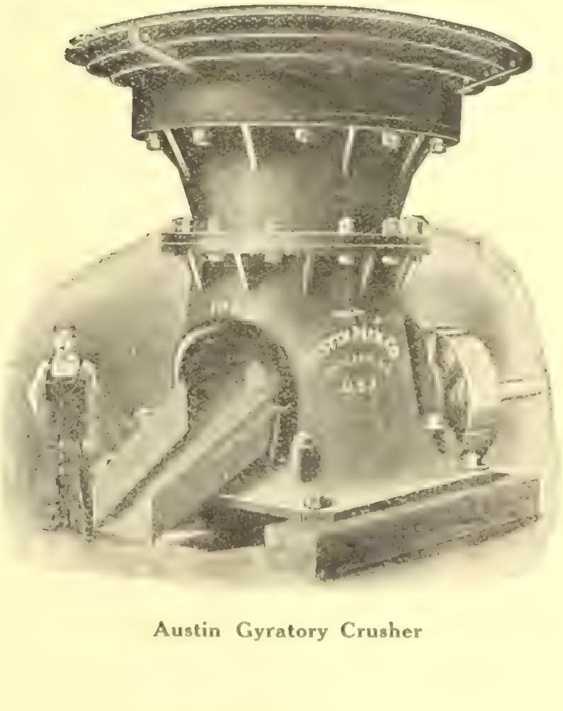
MUSSEN

mplete Rock Crushing Plants

signed and Supplied

Crushers
Elevators
Screens
Bins
Hoists
Derricks
Rock Drills
Drill Steel
Cars
Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co.
Hamilton - Canada
Limited

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto August 17, 1910 No. 33

Building Progress Well Maintained

Despite the approach of fall and the uncertainty felt in some quarters regarding the crop outcome, building activities are well maintained and there is a good volume of work projected. From some points, notably in western Canada, a lull in new work is reported. When we have received more reliable particulars about the crop, however, and the general public has a clearer idea of what the situation really is, it is quite possible that there will be a reaction, in the wake of which will follow many new projects. Supply dealers have had little to complain of this season. Across the border there was quite a depression following the early news of serious crop damage, but there was practically no reflex here.

The question was recently raised in a western city as to the right of the city engineer to bid upon city work, to be performed by day labor, as a means of restricting bids of contractors to reasonable amounts. Contractors in such competition would probably not raise very much objection to the additional bidder, if the same restrictions were laid upon the engineer that are laid upon them. If his bid had to be guaranteed to come within the figure and to be secured by a bond, as the regular contractors must do, the competition would not prove so very objectionable.

A circular issued by an insurance company calls attention to the danger to brick and stone buildings, by using wooden cornices, declaring that many have been burned from fires which communicated along the wooden cornices. It states that metal cornices are far more lasting and cost but little more than wood, while terra cotta cornice work is exceedingly decorative and can be secured effectively in the wall and become as enduring as the structure itself.

Is the Architect or Builder Responsible?

A somewhat curious accident was the cause of the death of a laborer in London recently, and the principal facts were elucidated at the Coroner's Court later. It appeared that a new building was to be erected on a site partially covered by an existing house that had been built many years ago. The architect, in designing the new building, found than an existing gable wall coincided with a required wall in the new premises. It was arranged, therefore, that the demolition should not be complete, but that the wall in question should, as far as necessary, be left standing and utilized in the new work. No doubt a saving of expense entered largely into the reasons for the proposal. The work proceeded in accordance with this arrangement, and at the time of the accident the condition was that the building had been demolished, except the wall, some 8 feet or 9 feet high. On one side of the wall the ground remained clear and on the other some tons of ballast were stored. During the shifting of this, a considerable portion ran down the slope of the heap and rested 2 feet or 3 feet deep against the lower part of the wall. The lateral pressure proved too much for the wall's stability, and it fell over, killing a man in so doing.

In commenting upon this a London building paper says: An examination made of the material of which the wall was composed showed that the mortar was much decayed and the bricks, a common stock, were not properly bedded. On one side the pointing had been removed, and on the other a plaster surface prevented a close examination of its condition. These circumstances afforded an opportunity for the rotten state of the wall to escape notice. It is questionable, however, if such should have been the case. Before any portion of an old building is incorporated in a new, it would appear to be a *sine qua non* that its strength should approximate to that of the structure to be erected. During the demolition of the other and principal part of the building it should have been possible to ascertain to a great extent the general condition, and unless the part pulled down was much more sound than that left, an unlikely event, knowledge should have been gained to warrant a total demolition. Further, it is not impossible to a practical man to easily find where unsound work exists. There was no evidence that this had been done. The jury brought in a verdict of "Accidental death," and added no rider. Beyond this we have no intention of going, but the question will necessarily arise who should be responsible in such procedure as here illustrated, independently as to whether or not an accident is the result. An architect wishes, no doubt, to carry out his work as reasonably as possible, but his knowledge must be such that his plans and specifications involve the use of nothing defective.

A builder's point of view, if he contracts at competitive prices, is somewhat different. If he sees that a mistake, or potential causes for mistakes, are given to him in the conditions under which he tenders, it may be to his advantage to keep silent until the contract is signed. An error afterwards discovered is often an opportunity to increase profits; such cases have been known. But the concealment of a mistake until dangers arise can have no justification, and a builder would show up badly if such a fact could be definitely proved. A foreman, again, should undoubtedly draw attention to such an occurrence immediately it becomes known to him, and any neglect to do so would throw upon him a responsibility from which he would have a difficulty to free himself. These three should be sufficient to enable errors to be discovered, but it is probable that the division of authority enables detection of a fault to escape, each relying upon the other. It is a pity that this should be so, but it is difficult to devise a means of altering and improving the system.

Time Limits in Contracting and Responsibility for Errors

Editor, "Contract Record":

In your editorial on the above subject published July 13th last, you touched upon some very vital matters, but the remedying of such evils as you discuss is a very big task. An engineer or an architect should certainly study the interests of fair competition and allow ample time both for figuring on the work and for its completion. It is manifestly unfair for them to set an inadequate time limit and then blame the contractors for subsequent mistakes. Of course it can very well be argued that the contractor, also, agrees to the time. That is quite true, but after all the contractor simply signs what the other man writes, in reference both to time and the material to be used. He is not altogether a free agent in the matter, as the only alternative to signing is to hand over the work to one's competitor.

While admitting the gravity of the situation, I do not see any way of improving the state of affairs unless it be by the unification of contracting interests — the formation of a sort of "combine" to work for the protection of reasonable rights and privileges and to protect the contractor in such cases as you mention.

My signature need occasion no surprise. I am too busy and the weather is too hot to get mixed up in any controversy, but I shall follow the expressions of your readers with much interest, for I consider the matters under discussion really live issues.

"CONTRACTOR."

Competition as a Means of Promoting Efficiency

Efficiency is promoted by competition. Any man having sap works best and plays hardest where a rival is in the field, be the stake money, fame or the favor of a maid. It is a common and a perfectly logical thing to make use of this fact in engineering production. Pitting man against man or gang against gang promotes efficiency by introducing into everyday tasks the elements of rivalry and reward for victory. There is no gainsaying the truth of this. It is not true, however, that it is enough merely to bring about rivalry. The competition must be wisely directed or it may result in more evil than good.

We are led to make the above statements by the story of an engineer who had to take over a construction work on which the pitting of foreman against foreman and gang against gang even to the extreme of working on racial and religious prejudices had been made a star feature of the management. The engineer found a very pretty mess on his hands. Rivalry had run wild. It had become in the minds of the men and to a very great degree in the minds of their foreman, the vital thing that the "Irish" had beaten the "Dagos" or vice versa, rather than that a good 24 hours' progress had been made. Trickery had developed. Mike's gang felt elated when it could leave the work in such shape that Giuseppe's gang which followed must spend so much time in clearing the way that its output fell short of its rival. The gossip of the bunk house was not of records and output, but of the fulness and snap of Giuseppe's maledictions and in speculation on the probable nature of his "come back." The trouble was overcome only by discharging half of the men and reading the riot act to the other half. Naturally the engineer disparages competition.

Doubtless the case is an extreme one, but also one not at all improbable of occurrence. It illustrates the important point that the introduction of competition in engineering production, while strong for good, may become strong for evil. In shovelling earth into wagons or unloading rails from cars, pitting gang against gang in competition is a simple matter, but in, say, tunnel work, where the effective work of one shift depends on the honest and efficient performance of its task by the preceding shift there must be stern and wise direction of competition or its value ceases. Conditions will determine the best manner of this direction; its necessity is the point we make here. It may frequently be the part of wisdom to eliminate all tendency to rivalry. Because this happens we may not condemn all rivalry at all times. Just as certainly as there are cases where its wisdom is doubtful, so are there cases where it is a powerfully effective means for increasing performance. —Engineering-Contracting.

Fire Test on a Mushroom System Building

As the most important point that concrete exponents bring forth after proving the economy of construction, is the fact that reinforced concrete is the only fireproof building material commercially used, the results of a test applied by the building department of Denver are rather interesting:

The slab selected was a 7½-inch slab, in the Railway Exchange building. The panel size is 14x20 feet, reinforced with ⅜-inch round rods, running four ways, 8 inches on centre, the Turner mushroom system of reinforcing being used. The slab was poured on February 18th, and the test took place April 28th, giving the concrete an age of 69 days. The panel was loaded with 60,800 pounds of cement, or approximately 225 pounds per square foot. The deflection under this load was exactly ⅛-inch. A fire was then started by igniting two cords of very dry pine wood and five gallons of kerosene. This was allowed to burn about 18 minutes, when the deflection was increased by one nich. The fire was then extinguished and cold water sprayed on the under side of the slab, causing about nine square feet of spall to a maximum depth of one inch.

The test load was removed and four hours after the test a recovery of one-half-inch was recorded. By nine a.m., May 6th, only ⅜-inch deflection remained.

The conclusions to be drawn from this test are that while the test was absurdly severe the concrete was practically unharmed, as the slight spalling was merely on the surface and was due to the great extremes of heat on material which had not had time to properly cure. The rocks forming part of the aggregate were clearly broken, showing the adhesion of the cement was perfect.

It is expected that the contracts for the construction of all the ships of the Canadian naval service will be awarded in October or November and that the keels will be laid within a year from then. The intervening time will be required to get the building yards in readiness. The notice recently sent out to firms proposing to tender, asking them to submit their names to the deparement at Ottawa, has elicited replies from three Canadian and two British firms. It is not improbable that there will be an alliance between certain Canadian and British interests in that connection.

Advantages of Brick in House Building

Frame Construction less Durable and Ultimately more Expensive—Architectural and other Merits of Brick—Improvement in Recent Years*

In modern building conditions brick construction is in many instances as cheap as wooden frame houses, and in nearly all cases the difference is so slight that brick is preferable. Another point in favor of using brick for house building is the much greater durability of this material, its cheaper cost of repair and up-keep and the superior fireproof qualities. The cost of lumber has steadily advanced in the past ten years, and at the present rate it will soon become almost prohibitive as a common building material.

As a result of these conditions the use of brick on a larger scale than ever must become an important factor in the building trades of the future. Builders and architects formerly confined their attention for brick construction chiefly to town and city houses, but to-day there is a steadily increasing demand for country brick houses. Manufacturers of brick have helped along this movement by improving the variety and quality of their product, so that a greater architectural variation can be obtained. Architects dealt chiefly in wood because it was the cheapest material, and they were more accustomed to making designs for wood. But the day of shoddy architecture for country houses has passed, and our homes are made more dignified and solid by leaving out the flaring ornaments which wood produced.

Variety and Fashion in Building

A plain square colonial brick house, with two or more varieties and colors of brick produces to-day the most harmonious effects in country architecture. The white faced, buff and red brick give sufficient color to the walls to break any monotony that might seem apparent with only one variety. Furthermore, the different sizes of the brick enable architects to create more pleasing designs than ever before.

The style in building material changes with the change of fashion and demand. The present high price of lumber has stimulated builders and manufacturers to exploit many new materials to meet the new conditions. It is this more than anything else that has given terra cotta fireproofing block their present popularity, and by the same token glazed brick and tile are rapidly increasing in use. Variety is needed in building material, and there is room for all of these manufactured products.

But we are beginning to build much better and more permanent houses than formerly. The country was first built up with cheap wooden houses, and the temporary nature of many of these has called for the complete rebuilding in recent years of whole towns and cities. The disappearance of the frame houses in our cities is but an indication of the movement. Next they will disappear in the country, and houses of more substantial material will take their place.

Some recent comparisons of houses of brick and frame have been made to show that a man could build a substantial home of brick for almost the same price as of wood. The contracting builder is frequently confronted by the question of cost of these two types of houses. The owner prefers a house of brick which will last longer and prove more serviceable in the long run, but he is not always willing to put the extra money in it.

Yet the relative difference between the cost of a brick, brick veneer and frame house is so slight that when we consider the other features the advantage is greatly in favor of the more substantial structure. Take the matter of repairs alone. A frame house requires painting every third year in even high and dry climates, and along the coasts the rule is about every second year. Indeed when exposed to strong salt air, parts of the building must be painted every year in order to protect the wood from premature decay. The cost of painting an ordinary house runs from $60 to $150, according to the cost of labor and quality of materials. In spite of such close attention to the painting, parts of the frame exposed to dampness, such as steps, piazza posts, sills and foundation beams will require renewing frequently. A carpenter would charge on the average $50 a year to make such annual repairs. In other words, one must invest annually from $75 to $150 to keep a wooden structure in good condition. Against this what do we have for the brick house? There is practically nothing to do to protect the brick, and if properly laid there should be no renewal of the brick for decades. Within five years the extra cost of upkeep of the frame house will be more than double the difference in the cost of the two types of houses.

Economy of Best Material

In building of brick it pays to use the higher grade products, and then to give special attention to the foundation. An insecure foundation will make the walls bulge and crack, and then your brick house is doomed to early decay. Half the trouble with brick houses comes from improperly constructed foundations.

Brick manufacturers are interested in making houses constructed with their material popular and also in influencing builders and architects to make the best of their opportunities. The public is often in ignorance of the actual value of different building materials and accepts without question the recommendations of architects and contractors. A great many would prefer brick or semi-brick houses for their country homes, but they are deterred from it because of the idea that brick cost so much more than lumber. While this was true a quarter of a century ago, it does not hold to-day. Conditions have changed, and the public needs to be educated to an appreciation of the change. Who can do this better than organized manufacturers of brick, working through the architects and builders? Induce the latter to present the advantages of the brick dwelling, and the gain will be enormous.

We are building better and more substantial houses to-day, and few put up a structure with the idea of temporary use. The need is therefore for good building material and for permanent homes.

A brick manufacturing plant costing about $40,000 will be constructed at Nanaimo, B.C. The plant will have a capacity of turning out 25,000 bricks per day.

An exploring party which has just returned to Edmonton from the Peace river country estimates that there are 28 cubic miles of asphalt in the vicinity of Fort McMurray, just waiting to be taken up. It is to be found in great mounds along the Athabasca.

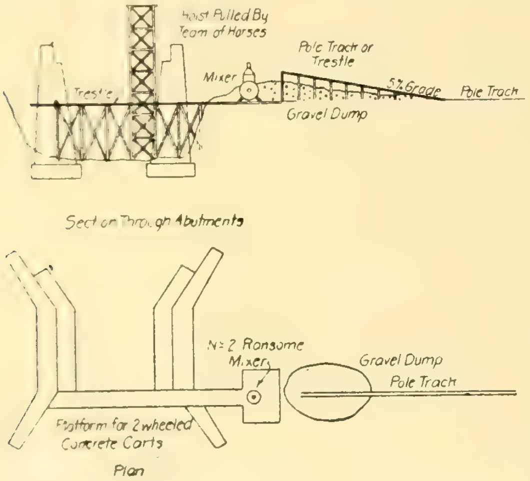
---

*By courtesy of the Building Brick Association of America.

Cost of Constructing Concrete Abutments

Interesting Details of Work on the Transcontinental Railway in Quebec — Methods Employed — Lay-out of Construction Plant

The following costs relate to the construction of two wing wall abutments on the Transcontinental Railway, at Machent Pouce, County Montmaguy, Que. The accompanying sketch indicates the layout of the construction plant. The abutments contain 2,480 cubic yards of concrete in which rubble stone are embedded. There are 720 cubic yards of stone or practically 30 per cent. of the volume. The gravel was obtained from a pit which was opened up for this work and was hauled 1,600 feet on a pole line track and stored in a pile behind the mixer. The pit had to be stripped from overlying earth, and this work was done by men and wheelbarrows. The rubble stone was obtained from the bed of the stream, piled on the bank and hauled 1,000 feet on pole line to a storage pile. From the mixer, the concrete was hauled in two-wheel carts on runways on trestle as indicated; about 500 cubic yards of stone and concrete were handled by hoist operated by horses. The figures given have been computed from data furnished Engineering-Contracting by R. M. Thompson, the engineer in charge of the work.



Lay-out for Building Concrete Abutments

The total amount of gravel was 1,160 cubic yards, or 1 cubic yard per cubic yard of plain concrete. The cost of obtaining this gravel was as follows:

Item	Total	Per Cu. Yd.
Looking for gravel	$ 82.19	$0.047
1,600 feet pole track at 11 cents	252.10	0.143
Stripping top soil	257.20	0.146
Loading cars	497.82	0.283
Hauling 1,600 pole track car	336.90	0.191
171 feet trestle at $1	171.26	0.097
Total	$1,597.47	$0.907

The cost of gravel apportioned to the total 2,480 cubic yards of rubble concrete was, from these figures, $0.644 per cubic yard of concrete in place.

The cost of trestles and scaffolding was as follows:

Trestle No. 2 (399 lin. ft.):	Total	M. Ft.
21,500 ft. B.M., labor only	$305.60	$14.23
2,856 ft. B.M., 2-inch plank	33.07	12.00
Total	$338.67	

This gives a cost of 77 cents per lineal foot of trestle laid down:

Trestle No. 3 (114 lin. ft.):	Total	Per M. Ft.
4,238 feet B.M., labor only	$51.40	$12.13
2,000 feet B.M., 2-inch planking	24.00	12.00
Total	$75.40	

This gives a cost of 45 cents per lineal foot of trestle laid down:

Trestle No. 3A (22 lin. ft.):	Total	M. Ft.
1,608 feet B.M., labor only	$74.90	$11.77
1,472 feet B.M., 2-inch planking	17.64	12.00
Total	$92.54	

This gives a cost of 77 cents per lineal foot of trestle laid down:

Trestle 4 and 4A (136 lin. ft.):	Total	M. Ft.
6,362 feet B.M., labor only	$74.90	$11.77
2,396 feet 2-inch planking	28.80	12.00
Total	$103.70	

This gives a cost of 55 cents per lineal foot of trestle laid down. Summarizing the cost of trestling and adding the cost of scaffolding, we have:

Trestle 2	$338.67
Trestle 3	75.40
Trestle 3A	92.54
Trestles 4 and 4A	103.70
Total trestles	$610.31
Scaffolding	43.83
Total trestle and scaffolding	$654.14

The cost of mixing and placing the concrete was as follows:

Item	Total	Cu. Yd.
Cement	$3,784.00	$1.53
Cement cartage	....	0.65
Cement shed	....	0.10
Hauling 2,062 bags at 6.1 cents	132.40	0.053
Wheeling shed to mixer	61.40	0.024
Loading and wheeling gravel to mixer	193.02	0.077
Foreman on concrete	135.13	0.054
Engineer on mixer	124.74	0.050
Man at hopper	48.00	0.019
Man discharging mixer	61.07	0.024
Wheeling concrete to bridge	166.77	0.067
Helping to tip carts	33.95	0.013
Spreading concrete	196.40	0.079
Total		$2.74

The cost of getting timber and setting up the mixer was as follows:

Item	Total	Cu. Yd.
Cutting 30 cords at $1.95	$58.67	$0.023
Carting 30 cords at $4.55	135.60	0.054
Setting up mixer	146.11	0.059
Total	$340.38	$0.136

The cost of collecting, hauling and placing 720 cubic yards of rubble stone was as follows:

Item	Total	Per cu. yd. stone	Per cu. yd. concrete
Cutting bush (½ acre)	$ 30.62	$0.043	$0.012
1,000 ft. pole track at 13½ cts.	135.10	0.190	0.055
Collecting and putting on bank	360.00	0.500	0.145
Loading onto stone boats	215.60	0.299	0.087
Hauling on pole track	175.00	0.243	0.070
Carrying from pile to wall	233.64	0.324	0.094
Total	$1,149.96	$1.599	$0.463

Some 500 cubic yards of concrete and stone were placed by means of a hoist as before stated. The cost was as follows:

Cost of Hoist:	Total	Per Cu. Yd.
Labor constructing	$137.82	.....
Timber	60.75	.....
Total	$198.57	$0.395
Cost of Hoisting 500 cubic yards:		
Labor and team	47.85	0.095
Grand total	$246.42	$0.490

The cost of forms, including materials and erection, was as follows, for 2,480 cubic yard of concrete:

Item	Total	Per Cu. Yd.
Carting 38,000 feet B.M., at $2.17 per M.	$ 82.45	$0.033
38,000 feet B.M. timber at $11 per M.	418.00	0.169
Labor	584.55	0.230
Taking down forms and clearing up	213.28	0.086
	$1,298.28	$0.518

The following miscellaneous items of cost complete the work:

Sundries	$136.49	$0.151
Tools and plant	252.07	0.101
Total	$388.56	$0.151

Summarizing the above items of cost we have the following unit costs for 2,480 cubic yards of rubble concrete in the abutments:

Item	Per Cu. Yd.
Gravel	$0.644
Trestles and scaffolding	0.264
Mixing and placing	2.740
Setting up mixer	0.136
Rubble stone in pace	0.463
Hoist	0.100
Forms	0.518
Miscellaneous	0.151
Total	$5.216

Prince Edward county, Ontario, wishes to spend an additional $50,000 on good roads and will apply to the Government for the customary one-third of that amount. Prince Edward is one of the foremost counties in the province so far as good roads are concerned

City Engineer Rust, of Toronto, estimates that if the roads radiating from Toronto are improved according to the recently adopted plan it will cost annually at least $18,000 to keep them in repair. The problem is how this bill will be footed.

Proper Types of Roads*

By J.C. Wonders, State Highway Commissioner of Ohio

Road building is largely a local problem, and the proper type of road to build is that which will make the best use of the material at hand to produce a satisfactory road surface, and at an expense not exceeding the money available.

In the earliest extensive road improvements in Ohio the problem was solved by using gravel for the wearing surface, and this early work was practically confined to the region where an abundance of gravel could be found. This region was principally in the central and southern part of the west half of the state, and embraced about one-third of its area. I have known of some instanes where gravel was shipped by rail for road work, but it was too expensive, considering the type of construction, and the practice was never extensive. A large amount of this work was built, probably fifteen to twenty thousand miles.

At the time of their construction these roads were undoubtedly the proper type, as the cost of the work came within the means of the farmers who paid for them. These roads in the best form of their construction, when new and in good repair, provided an admirable surface for public travel, and at present there are many of them which can hardly be excelled by the more modern construction.

The majority of these roads present in their present condition one of the most important problems of to-day's road work. On account of lack of sufficient repairs a large part of the mileage is practically worn out. Owing to the exhaustion of the gravel supply in a considerable part of this territory, the re-surfacing of many of these roads has been done with crushed stone, and, where properly done, using the old gravel road for the bottom course, very excellent results have been obtained.

In the present condition of the development of road-building, the best known type of construction in the gravel-road country would be the placing of a crushed-stone top layer on the road, leaving the old gravel to provide the bottom course. The old road should be graded to conform to the desired cross-section for the new road. Mud holes should be cleaned out and filled with gravel. The surface should be rolled and watered to produce a solid foundation. The macadam top course can be water-bound, or have a bituminous binder if the necessary funds for such construction are available.

Satisfactory Binder Needed

It is to be hoped that the development of bituminous binders will produce a binder that will hold gravel equally as well as it holds broken stone. If a successful binder of this kind is produced, and these old roads can be given a new top course of about four inches of bituminous-bound gravel, with a surface resembling an asphalt road, a most desirable result will have been accomplished.

Considering the number of investigators now at work on this problem, its solution is one of early possibility. If this method is successfully developed, it will furnish the most desirable type for the gravel region of the State.

In the eastern part of the State, extending from Lake Erie to the Ohio river, embracing about one-third of the State's area, fire-clays and shales suitable for the manufacture of paving brick, can be found in a majority of the counties. Gravel is not plentiful, and is usually of poor quality; limestone, where found, is usually of a good quality for road building, but seldom is in sufficient depth to be profitably quarried. In this region the brick-paved road provides the best construction that has been devised. A well constructed brick road on a concrete base and grout-filled, under ordinary travel should last for more than fifty years.

---

*Paper read at meeting of Ohio Engineering Society, Columbus, Ohio

The cross section, like the road covering, becomes, only in a more limited sense, a local problem. In level regions, with slight grades, it is imperative to raise the grade above the surrounding country, and to do this it is necessary to take the fill from the side-ditches, requiring them to be made wide and deep. The bottom of the ditch should be placed from eight to ten feet from the edge of the berms. The ditch should be cut with straight slope from its bottom to the edge of the berms. This will permit a mowing machine to be run down the slope to the bottom of the ditch, an arrangement that materially reduces the cost of keeping the road clear of weeds and brush.

The bottom of the ditch should be made parallel to the centre line of the road, and the slope of the sides of the roadbed will vary with the changes in the depth of the ditch. The back slope should be one and one-half horizontal to one vertical. The two slopes join at the bottom and will make the cross-section of the ditch "V" shaped. My first work on this style of cross-section was more than 25 years ago, and I have had the opportunity to observe the excellence of these ditches after they have sodded over, and the ease with which they are maintained.

In a hilly country, with frequent cuts, this style of cross-section is not advisable, as a wide ditch adds to the width of the cuts, and consequently to the expense of construction. For this class of work, a ditch four feet wide from the shoulder of the grade to bottom line of the ditch is recommended, excepting that where rock cuts are encountered, the ditch can be made still narrower with economy.

For a macadam or gravel road it is most desirable to have the improved road surface in the centre of the cross-section of the grade. For brick roads, excellent results are obtained by placing the pavement on one side of the centre line and providing an earth driveway on the opposite side. Many miles of this style of road that are giving excellent satisfaction have been built by the authorities of Cuyahoga County. An objection to the earth side-track for macadam or gravel roads is the tendency to carry mud from the side-track onto the improved road, and it is likely to pick up the stone and make holes. Also, the surface of this type of road is usually so agreeable to travel on that there is not the demand for the side-track that there is in case of the brick road.

A Renaissance in Brickwork

Just now we are at the beginning of a period not only of extraordinary activity in all the creative arts, but also of a Renaissance in industrial art conditions, says "The Craftsman." In common with other nations, but to a greater degree, this country has been suffering from that "blight of perfection" which had birth in the Victorian era and which spread for over a generation through all phases of existence not only in England but in America. This blight was particularly serious throughout the artistic world, preventing individual expression of beauty all along the lines of the fine and industrial arts. And, because of our progress in science in America, and hence greater productivity of machinery, the blight increased until art achievement in every direction was positively paralyzed. Our pictures and our sculpture became the slickest (to use a good old Yankee word), most highly polished exhibition of trivial imitation; our houses inside and out were overfinished and overfurnished and without personal interest; our clothes were all an overfine imitation of something which we thought better; our woods were varnished and veneered out of all beauty and naturalness; our brick were painted, or hidden under smooth cement, and so on through every last ramification of our artificial, highly polished, disingenuous civilization.

Now, at last, we are reacting from this. In common with other nations we are discovering that we have been in the grip of a strange aberration, worshipping false and foolish gods; that there is no such thing as a perfection of beauty; that in truth there is only ever-increasing beauty, as there is an ever fresh, varying expression of individual understanding of art.

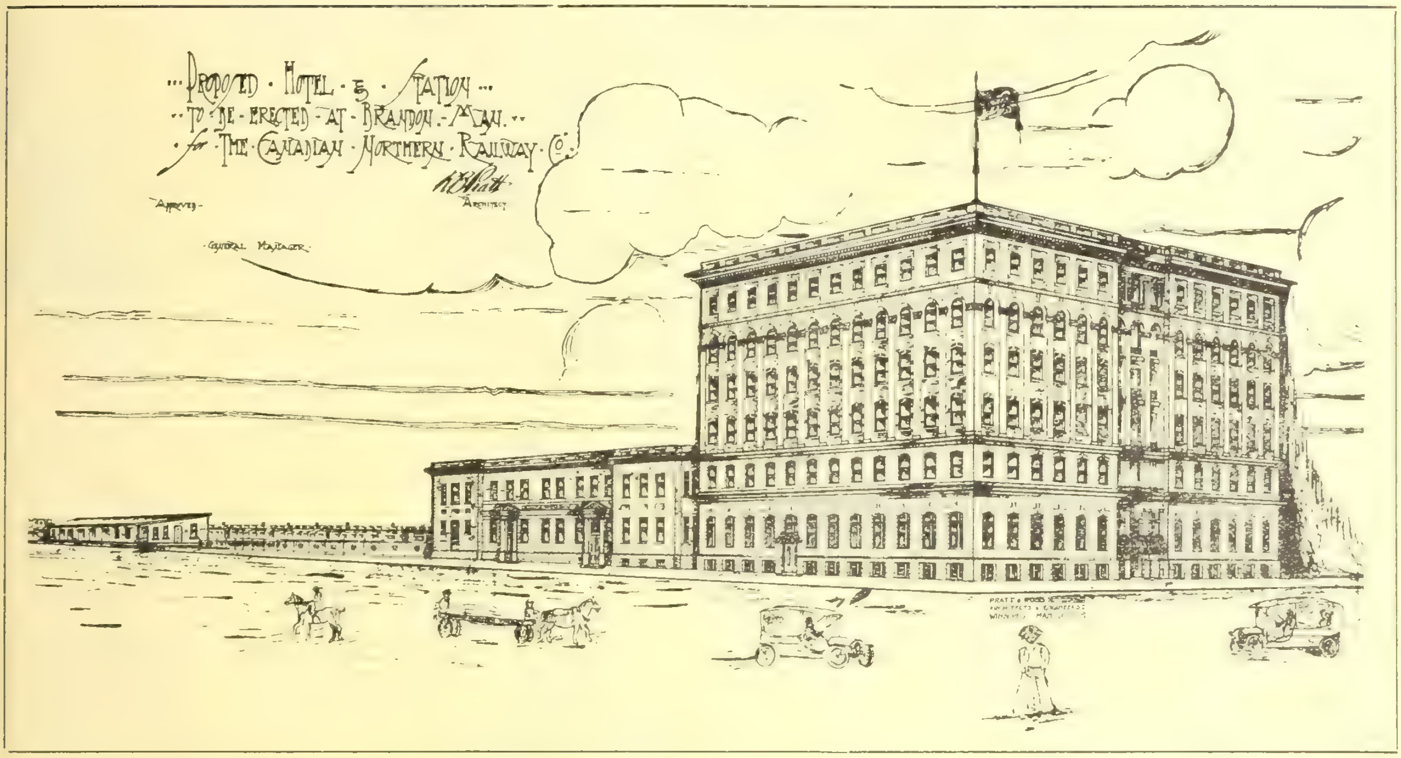
In truth, the life of art and its varying expressions depend only upon the extent to which the people of a nation have opened their minds to the inevitable inspiration of their surroundings, and have added to understanding the trained eye and the technical hand.

What we have been calling perfection, then, through these last few decades, was merely a degradation of the imagination, a blindness of the eyes, and a forgetting that individuality was the very cornerstone of art achievement. But to-day again that quality known as texture, which expresses the varying individuality and interest of the creator, which has been always in the past vital to beauty, is becoming a final standard in industrial achievement. And so when we speak of the Renaissance in brickwork, we mean that here in America, at least, we are again considering brickwork as an art, and brick as a material with which to emphasize those pleasant sensations of color, line and proportion known as artistic effects; and we are ceasing to think of it as an uninteresting product of clay, a sort of artificial stone, to be used where the builder could not afford granite or marble or some other real material, a dull, commonplace, poor relation, to be thought of only as a substitute, not in itself desirable where impressiveness and beauty were being sought.

Now, back in the Victorian period some such careless definition of brick and its uses might have been accepted without comment, and yet even then had any of us stopped to review the actual history of it as it can be read in museums, in ruins and in Oriental and Continental architecture, we would have realized the possibilities of brick, for in those early days builders knew its value and used it nobly and lastingly. Possibly it has been a study of those conditions which has brought about this Renaissance of brickwork, and which has inspired our manufacturers to create a new enterprise and to develop a modern brick which should rank as a culmination of the history which begins back in some of the most noble architecture of Egypt.

H. F., Montreal, desires a comparative statement of building operations at Brandon, Man., for 1909 and 1910. We are glad to be able to furnish this information. The particulars came to hand too late for inclusion in the table published in our issue of July 20th. Value of permits issued July, 1909, $20,480; July, 1910, $19,960; Jan. 1st to July 31st, 1909, $224,615; Jan. 1st to July 31st, 1910, $419,010.

A large piece of Roman pavement was recently unearthed in England by some workmen while engaged in repairing the floor and foundation of Winchester Cathedral. The pavement was found to be in an excellent state of preservation, being intact, and presenting very little evidence of disintegration. It was about 14 square feet in area and was discovered at a depth of 9 feet.

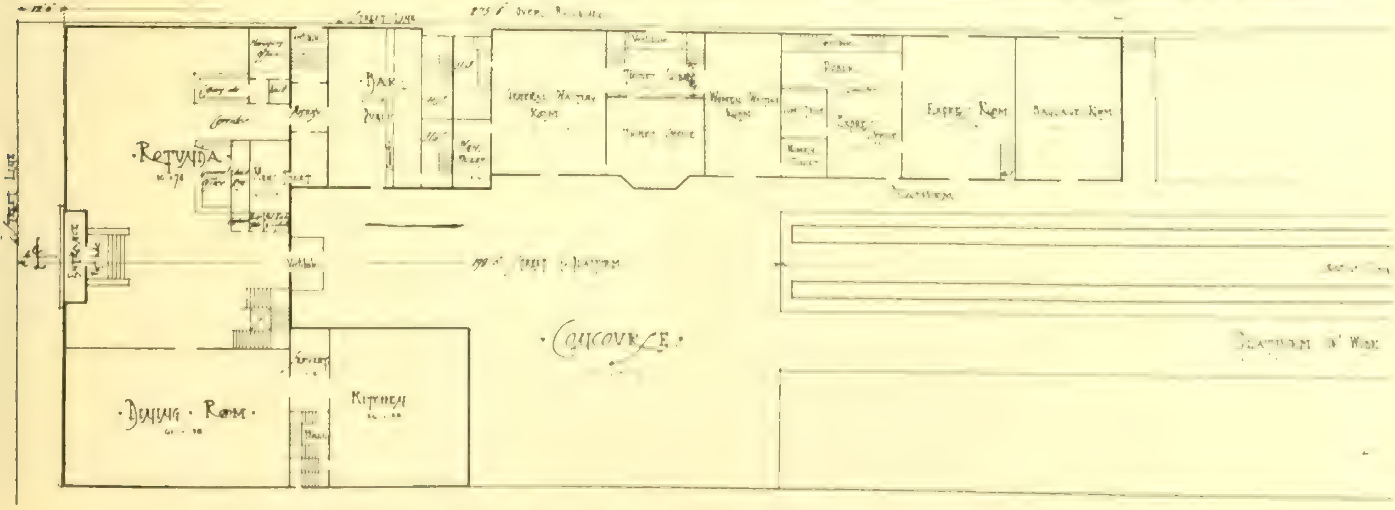

Proposed · Hotel · & · Station
To · be · erected · at · Brandon · Man.
for · The · Canadian · Northern · Railway · Co.
Architect
Approved
General Manager

Canadian Northern Hotel, Brandon

The new C.N.R. hotel at Brandon, Man., is to have a frontage on Princess street of 120 feet by 100 feet on Ninth avenue. South of the hotel and adjoining it will be a station, 190 feet long by 36 feet wide, two storeys and basement. The station will be built of stone and brick in classical style. Provision is made on the ground floor for large general waiting rooms, ladies' waiting room, ticket lobby, express office, telegraph office and express and baggage room. The first floor will contain the general staff offices. These are reached from a separate entrance on Ninth avenue. Passing through the station the concourse is reached, with three stub end tracks for passenger service. The concourse extends to the rear of the hotel with an entrance into the main rotunda.

The hotel will be 90 feet high, seven storeys and basement. In the basement will be located the billiard room, barber shop, public baths, lavatories, store rooms and machinery room. Provision is also made for a future grill room and cafe. On the ground floor adjoining the station is the bar-room, which will be finished in fumed oak with red tile floors. The rotunda occupies all of the corner of the hotel and fronts on the two streets. It will be 76 feet x 62 feet and in it will be located the office, manager's office, check room and news stand. To the west of it is the dining room, 39 x 63 feet, which will be panelled in mahogany. This room is free from columns so as to give an unobstructed floor for assemblies. To the rear of the dining room is the kitchen, about 35 x 39 feet, pantries, etc. The drawing room on the first floor is 32 x 48 feet. Off this is a writing room. The bedrooms are arranged both single and en suite, about half of them being the latter, and supplied with bathrooms. On the top floor are the servants' quarters and ten large sample rooms. The latter will be well lighted and ventilated. Two elevators are provided in the building for passenger service and one for handling freight.

The building will be heated by steam secured from



Section of Ground Plan, Canadian Northern Hotel, and Station, Brandon, Man.

the Brandon Electric Light Company's plant. A ventilating system is to be installed, also a refrigerating system for the kitchen, larders and bar-room. The building will be lighted throughout with electricity and will have an independent pump for fire protection purposes.

The building will be of steel cage construction with reinforced concrete floors. The exterior walls will be of stone and brick. The floors of waiting rooms and ticket lobby, also of the rotunda, billiard room, etc., in the hotel, will be of tile. Plans were prepared by Messrs. Pratt & Ross, architects and engineers, Winnipeg, under the direction of Mr. M. H. McLeod, general manager of the Canadian Northern Railway.

The Prevention of Building Accidents

Stability of Scaffolding the Chief Consideration—Adequate Width for Platforms, Runs and Gangways—The Evils of "Deceptive Safety"

Speaking generally, it may be taken for granted that a large proportion of the accidents which happen are due to weak or unstable scaffolding, or portions of scaffolding not properly protected. The question of strength and stability is a most important one, but no definite rule can be suggested to prevent dangers arising from these causes. Their prevention should at all times be a matter for proper consideration by those responsible for the work. So many factors have to be considered that each case must be judged on its individual needs.

Accidents can be practically divided into two classes: those where the workmen fall, and those due to falling material. Many builders imagine that a fall to be considered really dangerous must be from a considerable height. This is erroneous; a fall of from 10 feet to 15 feet is as dangerous as any, for in this distance the unfortunate sufferer nearly always pitches upon his head, and fractured skulls have usually fatal results. A body falling a greater distance often turns in its flight, and in consequence a man may escape with broken limbs, which, although severe, afford a greater chance of recovery. It is easy to argue that workmen should be alive to their surroundings, but if this alertness was practicable, very few accidents of any kind would ever happen; and where a man is continuously surrounded by dangerous conditions, it is impossible.

Danger of Insecure Guard Rails

For the prevention of falls, fencing should always be resorted to around working platforms, well-holes of staircases, and openings in floors and similar places. This need not be of an expensive character; there is, as a rule, plenty of loose timber on a building which can be used for such purposes without detriment to its value. Care should be exercised that the fencing is properly fixed, for instances are known where fatalities have occurred through insecure guard rails. There is no doubt that workmen feel safer if apparently well protected, and place reliance upon the means taken. If, then, the fencing is only a sham, the risk is merely accentuated. To put up a guard rail loosely is a fraud; an atmosphere of deceptive safety is created, and any workman trusting to it finds himself rudely enlightened. The best position for the rail is about 3 feet 6 inches above the platform level. It is general with some builders to use boards on edge, three or four in number. This is extremely satisfactory, but care should be taken that the highest board is about the height mentioned.

Well-holes in floors are particularly dangerous, for if material is being hoisted through them they cannot be covered, but rails can be provided in almost any case. The same may be said of staircase wells. A temporary handrail is easily fixed, but boards laid from landing to landing, if of the half-space variety, serve a useful purpose. Any such well, if over 18 inches in width, should be considered dangerous.

Ladders, again, are a source of danger. They should have a level footing, and be well secured at their highest point of rest. Also they should rise at least 6 feet above the place they give access to, otherwise the climber may miss the usual hand-hold, and fall. If this is impossible, a short piece of rope nailed across the top ends of the ladder will give notice in climbing that the full height is reached. The rope being pliable is more useful than a piece of timber, which may catch in a man's clothes and throw him. No ladder should be used with defective rungs. It is not easy to renew a rung without taking the ladder sides apart. Consequently, when a rung wears out, it is often replaced by an iron bolt. This in itself is dangerous, as it affords but an insecure footing to wearers of nailed boots. The ladders with square rungs nailed on to the sides should be viewed with great suspicion, as there is a great likelihood of defective timbers being used. This type is greatly improved if the rungs are housed into the sides.

Scaffolding Platforms and Other Sources of Trouble

Scaffolding platforms should be of sufficient width for the work in hand. This is generally provided for bricklayers and masons, but plumbers and painters are often badly served in this respect. Block scaffolds, that is scaffolds built up on loose brick piers, drain pipes, etc., are most dangerous, and should be prohibited. Very little vibration would cause a collapse; and bracing, often imperative, is impossible in such cases. Scaffolds should be complete, even to the guard rails, before work takes place upon them. As the plant arrives on the building all scaffolding should be carefully examined, and no confidence should be placed on timbers because they are new. Serious defects are at times found in such timbers. Dark interiors of buildings should be lighted. Artificial light can be readily obtained, and should be used.

Crates in which bricks are carried often cause danger by the bricks falling. There is an impression in the building trade that when the crate or skip is slung, the two sides exert a compressive stress on the load, and hold it in position. In practice this does not always hold good, and for this reason it is wise to provide the skip with four sides, two of which may be made removable to facilitate loading. Baskets should not be slung from their handles only, unless they are specially strengthened by the insertion of wire ropes or iron rods. Handles may pull out, and when much used they also get cut through. If there is any danger of this, the fall or chain should be carried round the bottom. Baskets strengthened as suggested by wire ropes, etc., are now on the market, and can be obtained at a trifling extra

Postum Cereal Company's Plant at Windsor, Ont.—Architects: Watt, Jacques & Williamson.

expense. As a set-off against this, they are repairable. The life of an ordinary basket is not long; perhaps a fortnight of constant use will see the end of it. If the handles, because of their extra support, are still in good order, it will be found economical to repair the body of the basket.

An accidental jar in hoisting may detach an ordinary hook unless it is "rung"; that is, carried through the handle and hooked into part of the chain higher up, but on the whole the spring hook is safer. Platform boards should be well and truly laid. An ordinary 12-foot board will tilt under the weight of an ordinary man if the weight is applied on a projection of over 6 inches beyond a support. This distance should never be exceeded, unless the board is lapped. All laps should occur over a support such as a putlog. If not, what is known as a trap is formed through which a man may fall. This is perhaps the most common danger on a building, and one for which most mechanics keep a sharp lookout. If the boards are butted, the putlogs carrying them at the ends should not be more than 12 inches apart, then, if the projections are equal, no danger need be feared.

Runs and gangways should be of adequate width, especially when at a height. Also when of more than one board in width, they should be so supported by straps that no undue and unequal sagging can take place. The greatest danger from sagging arises when the top surface of one board is pressed below the bottom surface of the one adjoining, for then the sole of a man's boot may be trapped, causing a trip.

Dust and Tar Spraying

The dust nuisance has for some years been the subject of experiment in Bristol, England, and Mr. E. D. Arnaud, the Canadian trade commissioner for Bristol, has written an interesting letter to the Department of Trade and Commerce, Ottawa, on the subject of dust treatment on macadam roads.

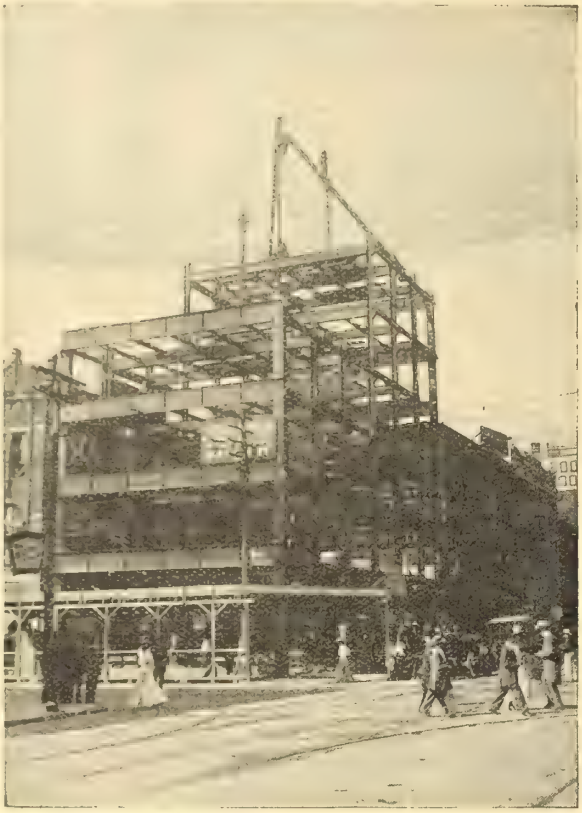
Bristol has found that tar spraying is the most satisfactory, economical and effective method of treating the nuisance. The system, tried first in 1907, has now spread to all the important towns in England and to many of the continental cities, superseding the watering cart. Mr. Arnaud furnishes figures of the comparative cost of street watering and tar spraying, showing that during the years 1904-5 and 6, under the watering cart system the average quantity of water used was 37,110,776 gallons per annum, but during the three years of 1907-8 and 9, during which tar spraying has been adopted, the average quantity of water used per annum has been only 27,143,166 gallons. This saving has been effected although the length of the macadam roads maintained by the corporation has been increased during the period specified by 22½ miles. The fact is that, including the expenditure of the tar treatment and the increased mileage, the cost of dust prevention during the past three years has not been more than the watering expenses in the three previous years, as well as being far more effective. Not only does a dressing of tar on the surface of a macadam road prevent the nuisance arising from the clouds of dust, but the same process prevents waste of road material caused by mud and the action of sun and wind.

Industrial Building at Windsor, Ont.

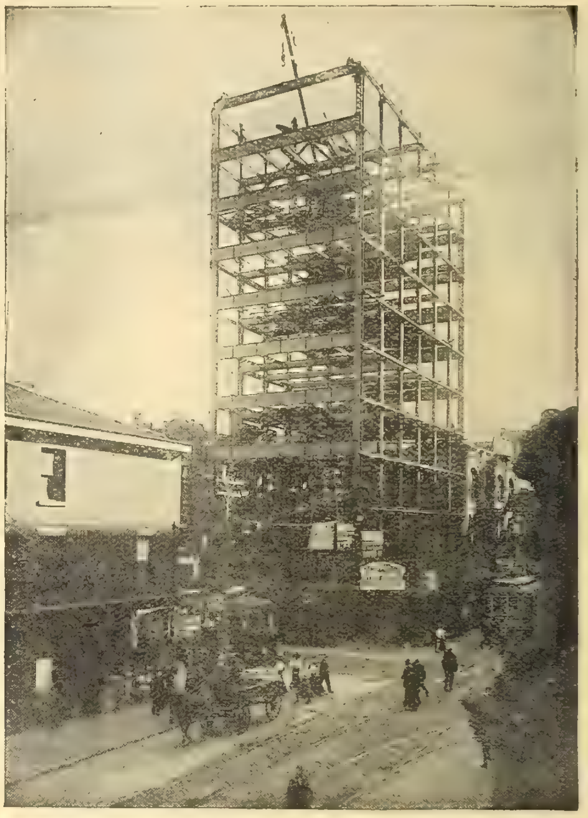
The accompanying illustration shows the latest of the buildings which have recently been constructed at Windsor, Ont., for the Postum Cereal Company, at a cost of $100,000. Six buildings in all have been erected and the last and largest of these was completed in 80 days from the time the ground was broken. The buildings are all of brick and reinforced concrete. The illustration showing a test of the reinforced concrete floors gives a fair idea of their strength. The test was made by the Michigan Technical Laboratory before the building was used. All the floors were built to carry a live load of 350 tons per square foot. Kahn bars were used for reinforcement. The general contract for the buildings was in charge of Euclide Jacques, and the sub-contractors were: Mason work, Thompson Bros.; reinforced concrete, Chas. Scott; plumbing, Thos. Blackburn; roofing and glazing, T. W. Brooks & Son. The architects were Messrs. Watt, Jacques & Williamson, Jordan & Griffith Building, Windsor, Ont.

Testing Reinforced Concrete Floors at the Postum Plant, Windsor.

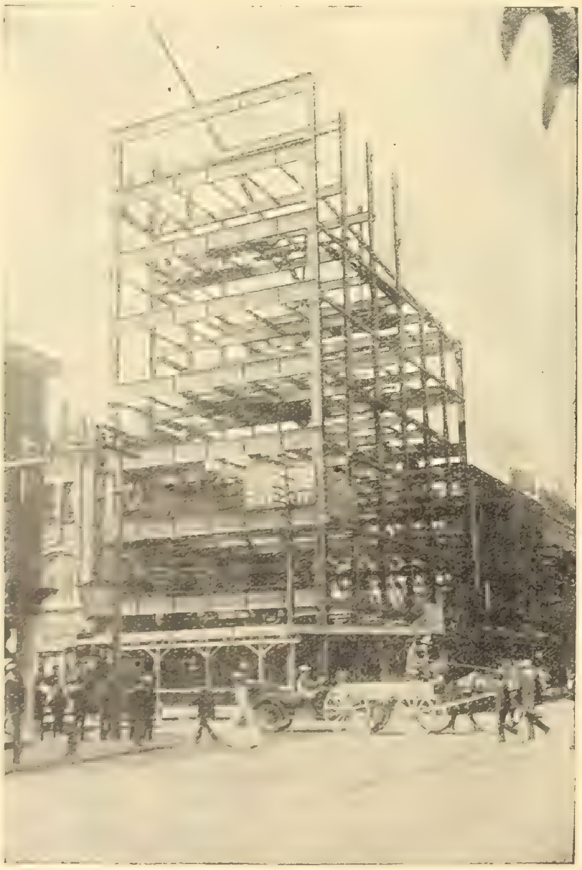
Progress of Erection on the Kent Building, Toronto



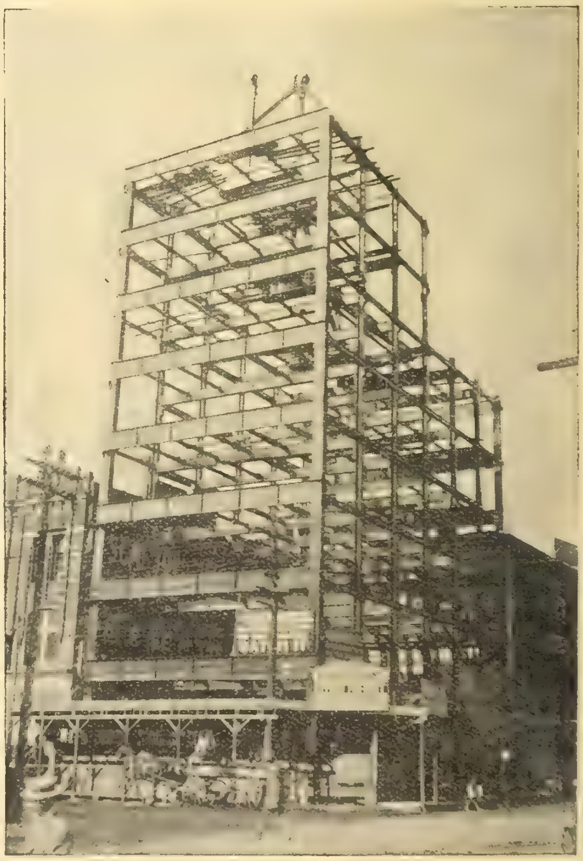
July 27th—A Good Record at an Early Stage.



August 4th—Completion of Steel Work.



July 28th—Compare with Above View.



July 29th—Looking to the Finish.

Expeditious Work on the Kent Building, Toronto

The record made by the Canada Foundry Company—ten storeys in ten days—in the erection of the steel work for the Ambrose Kent building at the corner of Yonge and Richmond streets, Toronto, is highly creditable to the contractors, and it is also of interest as showing the great advances that have been made during recent years in this class of construction.

The erection department of the Canada Foundry Company, Limited, commenced work on the 19th ult., and calculated to have the framework of this ten-storey building, comprising 650 tons of steel, erected complete within ten days. Owing to one or two unavoidable delays, however, the time involved in the work was twelve days. The corner columns are built in two-storey sections, five of these being placed to reach the top of the tenth storey. These columns weigh 10,850 pounds each, so that the complete ten-storey columns weigh 54,250 pounds. This weight is carried on concrete caissons that extend 25 feet deep to bed rock. The building is 40 feet x 80 feet and occupies one of Toronto's busiest corners. The heavy surface traffic on both facing streets had to be contended with, and nothing short of a complete organization could have handled the unloading and erection of this massive structure with such gratifying results. Owing to the walled-in situation of this building, only one stiff-legged derrick was employed on the erection, but even with this unfavorable condition, more than 54 tons of material were handled daily.

Song of the Ironworker

Well, gentlemen — swell gentlemen — in your frowsy dowsy clubs,
Take note o' me an' Bill McGhee, an' twenty other dubs,
Who's stuck agin the sky line, like flies agin a wall—
Ho, think o' me an' Bill McGhee, an' watch us as we crawl
Around the bars, between the stars, an' up the shafts o' day;
You hear the gang when the hammers clang, an' the bullgines hoist away!

"Ho, give us a job to fix the moon; to tinker the golden stair!
Give us a chance an' see us prance along a path o' air!
We'll hang for hours by our teeth to the flowers that grow in the turquoise bed,
An' rifle a seine through the silver rain for the tears that the angels shed!"

—A. D. Runyon, in N. Y. American.

New Record in Caisson Sinking

A pneumatic caisson sinking record has just been made in the foundations for the Municipal Building, New York, according to the Engineering Record. A caisson for one of the column piers was sunk through sand to rock at a depth of 112 feet 1 inch below water level without accident or casualty of any kind. The caisson is of concrete with a reinforced cutting edge, and supports a concrete shaft 10 feet 9 inches in diameter, cast before sinking. The construction of the caisson was commenced April 15th, and the bottom was passed May 16th. While under the maximum pressure of 47 pounds, the work was executed by 20 five-men shifts working about 40 minutes each, with a very long time for decompression and an interval of 1 hour between the two shifts each man worked daily. The men were under very strict physical and medical supervision, improved sanitary and hospital appliances were on hand and a competent physician was in constant attendance, and not even a single case of the bends occurred. This is believed to be the deepest pneumatic caisson ever sunk, and is expected to be the maximum for this building, which will have 106 caissons, over half of which have been sunk.

Trade Commissioner Mussens, of Leeds, England, has forwarded to the department at Ottawa a report on Canadian made rails. He states that the British authorities, on the advice of the Indian Government, which insisted upon a higher grade of railway materials, obtained quantities of rails from the United States and Canada. The tests so far are in favor of the Canadian product.

At the recent session of the consulting engineers of the National Board of Fire Underwriters and the executive committee of the National Fire Protection Association several collapses of sprinkler tanks were considered and plans were made for barring from the support of tanks all material subject to disintegration by the weather. It is possible also that the amount of water required in gravity tanks may be reduced.

The leaning tower of Pisa, according to the findings of a Royal Commission appointed to investigate its present conditions, instead of being supported upon a massive foundation, rests upon a ring-shaped masonry base having an inner diameter of 24 feet 3½ inches, exactly equal to that of the inside of the tower. In 1829 the tower, which is about 177 feet high, is said to have been 14 feet 5 inches out of plumb; since that time its inclination, the commission reports, has been increased by an additional 0.0055 foot per foot of its height. An earthquake in 1834 caused a deflection of about 5 inches.

To measure the heat generated by the hardening of Portland cement tests are being made in the Panama Canal zone by embedding in the walls of the locks built at Gatun, six resistance thermometers. At different stages in the settling of the cement readings of the temperature are to be taken. The temperature increases rapidly from the time the concrete begins to crystallize until it reaches its final set. From the settling point the increase is slow but usually continues during the hardening process, which may last several years. The results of these experiments will be likely to prove of great interest and may throw some light on expansion and contraction which is the bugbear of all cement users.

English spraying machines were used in 1909 by the Massachusetts State Highway Commission in applying tar coatings to road surfaces. They are made to heat tar with a coil supplied with steam from a traction engine or road roller, and spread it upon the road in a thin and even coat. The tar, according to the commission's last annual report, is kept under pressure by pumps geared to the wheels of the truck, so that a pressure is developed by the movement of the tar-spraying machine itself. The hot tar is spread through a number of small nipples which throw a fine spray; a hood over the nipples prevents the tar from being blown to one side by the wind. When a heavy grade of oil is used and applied hot at the rate of one-half gallon per square yard the cost is said to have varied between 6 and 11 cents per square yard including the cost of material, labor and the surface covering of sand, gravel or stone screenings.

Work on the National Transcontinental Railway

In the course of an interview at Quebec recently, S. N. Parent, chairman of the commissioners, said the line between Moncton and Winnipeg would be completed by the end of 1912, and that while waiting for the completion of the Quebec bridge a car ferry would be used to take trains across the river. The plans for the construction of terminals in Quebec would be prepared as soon as the contract with the city for the purchase of the Champlain market site had been signed. A Quebec dispatch says that the deeds transferring this property will be signed Sept. 1. Mr. Parent further stated in his interview that Cap Blanc and all the houses along the river front between Champlain market and Sillery would have to disappear; the Marine Department shops would also have to go, and these would probably be rebuilt at Sillery.

Referring to the work done on Division B., which extends from the New Brunswick boundary to 330 miles west of Quebec, a total of 507 miles, Division Engineer A. E. Doucet said that with the exception of a few breaks, such as the bridge over the Jacques Cartier river, and the yards at Cap Rouge, track has been laid for 188 miles from west of the Quebec bridge site to the St. Maurice river; and from eight miles east of Waymontachene as far west as the Hudson's Bay post. Grading has been completed for 78 miles west of that point, and it is expected that by the end of the season track will be laid to the crossing of the Gatineau river, about 235 miles west of Quebec. All grading has been completed south of the St. Lawrence to the New Brunswick boundary, and a considerable mileage of track has been laid. The work of bridge construction and filling is being proceeded with, and as soon as this is finished track laying will be completed. Of the total of 507 miles in the division there are only 60 miles upon which grading has not been done.

A Substitute for a Timber Trestle*

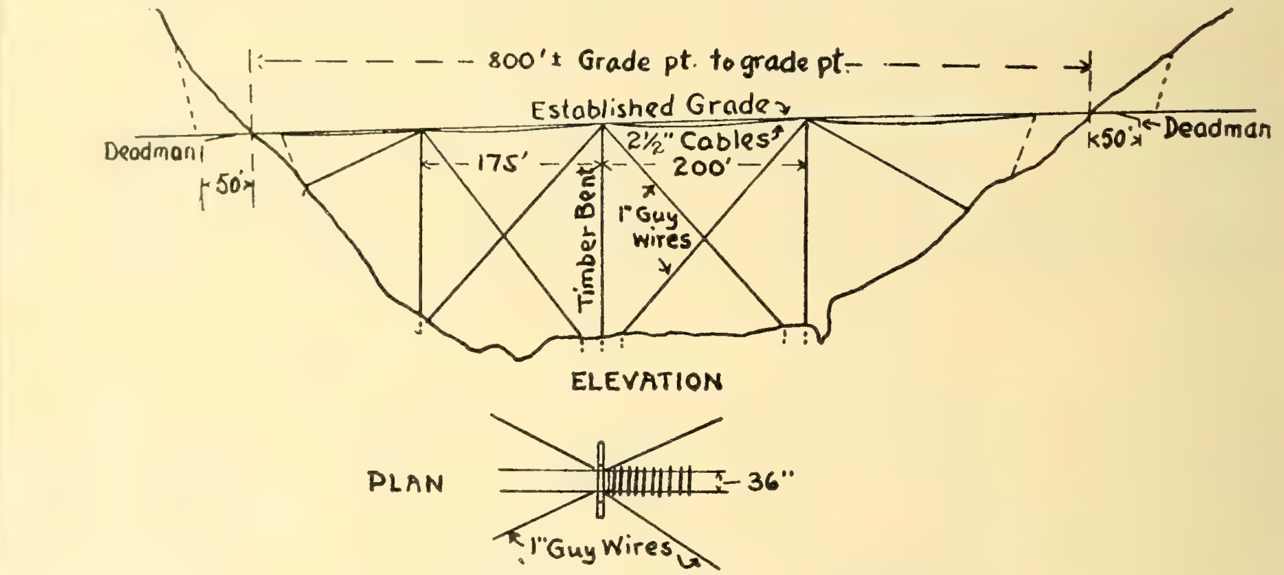
Usually two methods are employed in making embankments where locomotives and dump cars, either narrow or standard gauge, are used.

The first method is to lay the track on the ground, and by dumping alternately to right and left, jack up the track until the required height is reached. This method is most economically employed where the ratio of length and embankment to height is 25, or more, to 1.

The second method is to build a trestle and make the fill by dumping from it. Building trestles is more or less expensive, and, if the material to compose the embankment contains a considerable proportion of large rock or boulders, there is always the danger of carrying away a bent or otherwise seriously injuring the structure.

Several years ago, I was one of the engineers on a piece of heavy railroad work in the south where the embankments were high and were made by trestling. One of the embankments to be made contained about 115,000 cubic yards, reached a maximum height of 57 feet, and was slightly over 800 feet long, from grade point to grade point. To build a trestle would have cost between $6,000.00 and $8,000.00, and, as the material to make the fill was mostly rock, the chances were very great that a part of the structure would be carried away before the completion of the work. To avoid the necessity of constructing a trestle, the following scheme was adopted:

The cuts at both ends of the embankment were opened up in the usual manner with carts for about 60 feet, as indicated by the dotted lines in fig. 1. At points, approximately 50 feet from each grade point, deadmen were sunk, and two 1½-inch wire cables, spaced 3 feet 6 inches, were stretched from one to the other and hauled as taut as possible. At points about equally dividing the fill, three timber bents were erected, as shown in fig. 1. These bents were made from timber cut on the right of way. Their construction is shown in fig. 2. Caps were about 8 x 8 inches x 6 feet and sills about 10 x 10 inches. As this timber was cut on the ground, the dimensions varied slightly.



Plan and Elevation of Cableway on Timber Bents.

In erecting, the tops of the caps were brought to the established grade line, and the sills were sunk in a trench 3 or 4 feet deep, which was backfilled with rock or earth. This steadied the bents and prevented their kicking out at the foot. From the caps, 1-inch guy wires were run out at angles of about 45 degrees, in order to clear the dumping of material as far as possible, and fastened to deadmen. The main cables were then fastened to the caps by wire lashings and the ties placed on them, every third or fourth tie being lashed to the cables. The rail was then laid on the ties, brought to gauge and spiked up. Ties and rail were laid far enough ahead to accommodate the length of train used.

The method of operation was as follows: A train of loaded cars was backed on to the approach fill, and, at the point where the cables left the fill, were dumped, the first car on one side, the second on the other side, alternate cars on al-

---

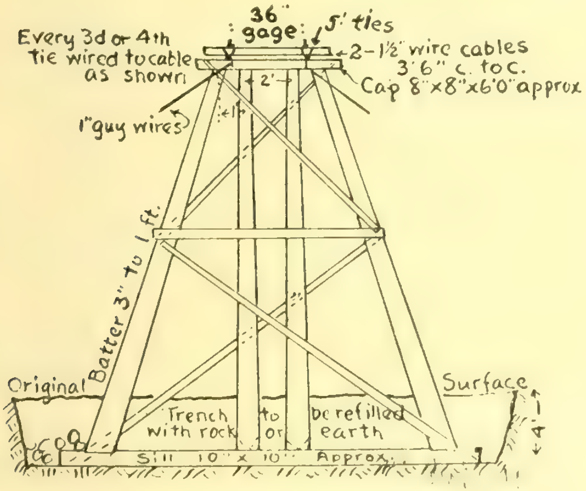
[*] From a paper presented by J. L. Ingle, jr., before the American Society of Engineering Contractors.

ternate sides, until the entire train was unloaded. The train was then run back on the approach fill and the cars righted. Dumping the cars on alternate sides balanced the weight on the cables, prevented the overturning of the train and made the fill about equal on both sides of the track. All cars were dumped before their loaded weight came on the cables, only empty cars being supported thereon. Little or no shovelling of material was required, most of it sliding to the bottom of the fill, and what little remained was generally used in jacking up the track. As the bents were approached, more or less care was exercised to prevent their being injured, but no more so than on any other trestle.

The work was carried forward in this manner until the ravine had been spanned, after which it was widened out in the usual way.

In building the trestle it was assumed that the deflection of the cables at the centre of a bey would be about 5 per cent. of the span, but, by jacking up the track as the embankment was made, the deflection was reduced to about 3 per cent. When dumping at the centre of a 200-foot span this gave about 6 per cent. grade for a dinkey engine to start an empty train on, and was not prohibitive.

The plan described left very little material in the dump, saved the main cables, guys, and caps, and was much more quickly and cheaply carried out than would have been the erection of an all timber trestle.


36" gage
5' ties
Every 3d or 4th tie wired to cable as shown
2-1½" wire cables 3'6" c. to c.
Cap 8"×8"×6'0" approx
2'
1'
1" guy wires
Batter 3" to 1 ft.
Original Surface
4'
Trench with rock to be refilled or earth
Sill 10"×10" Approx.

A Typical Timber Bent for Use Under Timbers.

I left for other work before the completion of this fill and so have no exact data as to cost. Figuring maintenance at the same rate as during my connection with the work, and barring accidents, the cost should have amounted to about 3 cents per cubic yard of embankment.

I believe this method is cheaper than a cable-way erected on tower bents, unless your span length is excessive. It would cost too much to erect a tower cable-way across a short ravine of 400, 500, or 600 feet. The span on which we worked the method described was 800 feet long. At that time this tower scheme had not been put on the market.

We hauled the cable-way as taut as we could with a block and fall. We made the height of the cap to grade. I would advocate a little more, but not much. We found when we came to the middle of the span, that there was only a 3 per cent. grade, i.e., 6 feet in 200; and if you have your bents slightly above grade, you will be fairly well up to grade at the spans.

I would advocate cutting down the bents before filling over them. You must exercise care in backing your cars on to any trestle, and only ordinary precaution is needed in working with this cable-way bridge.

A Reinforced Concrete Low-head Water Tank and Its Waterproofing

The city of New Ulm, Minn., has just completed a reinforced concrete reservoir of 1,000,000 gallons capacity, a cylindrical structure 75 feet in diameter with the walls 30 feet high, and covered with a conical concrete roof. Since it was of the utmost importance that the walls and floor should be water tight, special care was taken during the construction to grade the aggregate for the concrete. It has been found by experiments that the densest concrete can be made when rounded pebbles varying in size from about ¼-inch to about 2½ inches are used instead of broken stone on account of the ease with which such pebbles will move about in a quaking mixture while it is being worked in place, and adjust their positions so as to form the least amount of voids. For this reason pebbles were screened from a gravel bank and used instead of crushed stone for the walls and upper part of the floor, and the sand used was a mixture of very coarse and ordinary fine sand. To reduce the permeability of the concrete to a minimum, 20 pounds of hydrated lime was used in every barrel of cement, and after the forms were removed the walls were brushed and cleaned with steel brushes, and two coats of cement plastering were applied on the inside. The mortar for the plastering consisted of one part cement, two parts of sand, hydrated lime to the extent of 10 per cent. and Medusa waterproofing compound to the extent of 3 per cent. of the cement used. The proportion used for the concrete in the walls and the upper 4 inches of the floor was 1 : 2 : 4 and this proportion of concrete together with the plastering has apparently made the walls water tight, as no leakage has been noticed up to this tice except a small leak in the bottom shortly after the reservoir was filled, which was due to an imperfect bond at one point between the old and new concrete. This, however, did not cause serious trouble.

City Engineer Rust reports that good progress is being made on the Toronto filtration plant, where a force of 300 men is now employed.

The 17th annual convention of the American Society of Municipal Improvements will be held at Erie, Pa., August 11-16. For particular saddress the secretary, Mr. P. Filwell, 239 West 39th street, New York City.

The fourth annual exhibition of the Chicago Cement Show will be held under the management of the Cement Products Exhibition Company, Chicago, Feb. 15-23, 1911. The New York Cement Show is being held in Madison Square Gardens under the same management, December 14-20 next.

Hon. Thomas Taylor, Minister of Public Works for British Columbia, is making a tour of inspection of trunk roads throughout the province. The Minister has been taking notes of what is needed in this regard, the trunk roads having lately been taken over by the Department. Mr. Taylor looks forward to the time—and at no distant date—when there will be good automobile roads from Vancouver to Winnipeg and still further east.

Owing to the fact that the space behind the wall was filled in with earth before the concrete had set properly, the large wall which was erected to form the west side of the new boiler house for the new wing at the Parliament Buildings, Toronto, collapsed, and it will take two or three months to build a new wall. It took three months to build the section which fell, it being 100 feet long and 25 feet high. Huge blocks of solid concrete were strewn over the excavation for the new boiler room, which is to be 20 feet below the present level.

Bituminous Gravel Surface in Road Work

Satisfactory Results Obtained from Surfacing with a Mixture of Sandy Gravel and Asphaltic Oil—Details of Cost and Specifications

By A. W. Dean, Chief Engineer, Massachusetts Highway Commission.

In many sections of Massachusetts, there is a lack of good local material for the construction of road surfaces, and at the same time a plentiful supply of gravel that will not compact if used for road surfacing without the addition of some binding material; but when such binding material is added and the gravel is rolled and bound together, it has excellent wearing quality.

During the year 1909, the experiments were tried of using this sandy gravel, mixed with the proper amount of asphaltic oil, and the results of these experiments have been much more satisfactory than was expected by the commission when it was first decided to make the experiments. In the first experiment, gravel and heavy asphaltic oil were mixed hot and applied to the road, the thickness of the application being about 2 inches after rolling. At the same time a short section was constructed by applying hot asphaltic oil to the surface of a gravel road that had previously been shaped and compacted, and the result seemed to warrant a more extensive trial of this method, consequently, a section of road in the city of Marlboro was selected and the road built entirely by this method. The road was first graded and drained by the same methods that are in universal use by the commission in construction of State roads, after which a layer of sandy gravel was laid and rolled. On this layer of gravel was spread hot asphaltic oil, using about ¾-gallon to the square yard. Immediately thereafter, about 1 inch of sand was spread evenly and the road was then thoroughly rolled. This road was built in the fall of 1909, and is to-day in just as good condition as when first constructed, and it has not yet been necessary to expend any money in repairs of any kind. It presents a smooth, hard surface, showing no ruts or depressions.

The cost of this surfacing, including the heavy oil and sand in place, but not including any drainage or grading, was from $1,800 to $2,000 per mile, the bituminous surface being constructed 15 feet wide. The following are the specifications for the construction of the surface and also for the oil used:

Gravel Surfacing and Bituminous Wearing Course

Section 10.—On the sub-grade prepared as hereinbefore specified selected gravel shall be placed to the depth of 5 inches at the centre and 4 inches at the sides as measured after rolling. The gravel shall be a quality satisfactory to the engineer, and shall contain no stone greater than 3 inches in its longest dimension.

The gravel shall be spread from a dumping board, and care shall be taken while spreading to rake forward and distribute the largest stones so that they will be at the bottom of the gravel course and will be evenly distributed. This course shall be thoroughly watered and rolled to the satisfaction of the engineer with a steam roller weighing not less than ten tons.

Any depressions that appear during or after rolling shall be filled with gravel and re-rolled so that the entire surface shall conform to the cross sections.

In case oil cannot be applied to the surface of the gravel after it has been thus shaped, the contractor shall, before applying the oil, re-roll the surface and shall if so directed by the engineer sprinkle the surface before applying the oil thereto.

The width of the gravel surface shall be 15 feet.

Gravel pits shall be cross sectioned and quantities estimated in the pit.

Gravel found within the limits of the road excavation is to be paid for as excavation only.

On the surface thus prepared the bituminous binder shall be applied for a width of 15 feet, using about ¾-gallon of the binder to the square yard. It shall be heated to the temperature hereinafter stated and distributed evenly by means of such machine as shall be approved by the engineer, such machine to be so designed as to enable its operator to control the flow and distribute the material uniformly, leaving no streaks or spots, and also to enable the operator to "cut out" any portion of the roadway and to avoid any surplus deposit of the binder on the roadway or elsewhere.

If the engineer shall so direct, the bituminous binder shall also be further distributed by means of soft brooms or other device.

As soon as may be after the application of the bituminous binder, as above specified, a thin layer of sand shall be distributed evenly thereon to such a depth that after rolling to the satisfaction of the engineer no surplus binder shall appear upon the surface of the roadway, and so that there shall be a wearing course of the sand combined with the bituminous binder approximating ½-inch in depth.

As soon as the sand has been spread the surface shall be sprinkled and rolled.

The completed surface shall conform to the profile and cross section and shall be smooth and free from hollows or depressions. If at any time before the acceptance of the work spots or streaks appear, indicating a deficiency or surplus of bituminous binder or of sand, the surface shall be again treated with binder or sand, or both, as the case may be, and thoroughly rolled.

The bituminous binder shall consist of asphaltic oil conforming in all respects to the requirements of section 10b of these specifications, and when applied to the road it shall have a temperature of approximately 180 degrees F.

The gravel in the lower 5 inches is to be paid for as borrow as specified and the oil and sand as bituminous surfacing.

Asphaltic Oil

The oil submitted shall be of uniform color, appearance, general character and viscosity and must fulfill the following requirements:

(a) It shall not froth when heated to 100 deg. C.

(b) It shall have a specific gravity of at least 0.97.

(c) It shall not contain more than 0.5 per cent. of dirt or adventitious mineral matter.

(d) It shall contain not more than 1 per cent. of matter insoluble in carbon bisulphide.

(e) It shall be of such viscosity that 60 c.c. measured at room temperature (78 deg. F or 26 deg. C.) shall when at 100 deg. C. be not less than 250 seconds nor more than 500 seconds in passing the Lawrence viscosimeter or 200 c.c. measured and tested at the same temperatures shall be not less than 900 seconds nor more than 1,800 seconds in passing the Engler viscosimeter.

(f) When 20 grams are heated in a flat bottom dish 3 inches in diameter for 24 hours in a well ventilated oven kept at a temperature of 250 deg. C., the loss in weight shall not be greater than 15 per cent.

(g) When subjected to a number of heatings at 250 deg. C. in a well ventilated oven with intermediate separations of asphaltene and of matter insoluble in carbon bisulphide until the final petroleum ether extract is not more than 10 per cent. by weight of the original sample, it shall show the following results, assuming also that this final 10 per cent has the same composition as the 90 per cent. of the material examined: The total loss shall be not more than 35 per cent. by weight, the amount of asphaltene in the original sample shall not be greater than 6 per cent. by weight, and the amount of asphaltene formed by this treatment plus that in the original samples shall be at least 58 per cent. by weight of the original sample. The amount of matter insoluble in carbon bisulphide as a result of this treatment, shall be not greater than 5 per cent.

The contractors of Victoria, B.C., consider that they have a serious grievance against the city on account of the policy adopted in connection with the construction of public works under the contract system. The principal objection is against the appointment of inspectors who know nothing about their work. It is claimed that sidewalk inspectors should be men with a practical knowledge of cement work. The matter has been taken up vigorously by a number of contractors, who have decided not to tender on this class of work unless they are assured that practical inspectors will be appointed. As a result of having inspectors who are not acquainted with the work, contractors are often delayed because they have to follow out the instructions of the inspectors. If the work is being done under a guarantee to have it completed within a certain time, this frequently results in anxiety and sometimes in loss to the contractors.

The Edmonton-Strathcona Bridge

The new bridge that will span the North Saskatchewan river, connecting the cities of Strathcona and Edmonton, will have a total length of 2,687 feet from face to face of ballast walls. It will be approached from the Strathcona end on a curve of 6 degrees 7 minutes, near Legal avenue, and cross Soullier and Angier avenues, and will be carried on 29 sets of pedestals to the Edmonton shore, where it will cross the Canadian Northern Railway, Saskatchewan avenue, Hardisty avenue, McKay avenue and Victoria avenue, the Edmonton approach being on a 2 degrees curve, a total of 1,888 feet, 7 inches, being on a tangent.

The approaches to the bridge will provide for the C.P.R. tracks, with one track for the street railway on either side, a 23-foot roadway with an 8-foot sidewalk on either side. About half way between Soullier and Angier avenues the roadway and sidewalks will be carried to a lower level, and carried across the river beneath the floor of the bridge carrying the steam and street railway tracks, near Saskatchewan avenue. Concrete pedestals will be built in groups of four, with foundations carried to hard pan, piles to be used only if necessary, to carry the superstructure over the land. Upon these pedestals will be erected steel work of the same character as that used in the Bell river bridge, to carry the double deck, rail level at the highest point being 140 feet above ground. This portion of the bridge is on the Strathcona side, and the superstructure will consist of seven spans of 49 feet 5 inches, alternating with six spans of 97 feet 8 inches, and one of 99 feet exclusive of the approach spans.

The river will be crossed on three spans, carried on concrete piers, two of 291 feet 10½ inches and one of 293 feet 3 inches. The foundations of the four piers carrying these spans are to be carried down to a solid foundation, concrete piles to be used if necessary, and are to be constructed so as to carry nine tons to the square foot. The two centre piers are to be protected against ice, etc., in the usual way.

Two spans on the Edmonton side on pedesatls will carry the bridge over the Hudson Bay reserve and the C.N.R. right of way. The height of the floor of the railway deck will be 14 feet clear from the roadway, which will be 23 feet clear, the sidewalks being carried on a bracket work. The railway track deck will be 35 feet wide.

Building operations at Merrit, B.C., are reported to be very lively. A score of residences and four good sized business blocks are in course of construction. There is great demand for railway laborers at Merritt. Contractors on the Kettle Valley line are prepared to maintain a staff of 1,000 if they can get them.

The Portland cement deposits on the United Empire Company's property on One-Mile Creek, near Princeton, B.C., are being investigated by John George, who has arranged for the purchase of 80 acres from the United Empire Company. If present indications hold out, the proposition gives promise of developing into an important industry

Port Arthur's Good Progress

Evidences of Steady Growth in all Sections — Two Millions to be Expended by Various Industrial Concerns

Port Arthur, Aug. 12th, 1910.

There is no spasmodic boom going on in this city, but a steady, legitimate growth. The stores and houses which are being built this year will find a market long before they are completed. The buildings are all of a substantial character. The stores which are being built in the business section are of spacious and handsome structure and the houses are in keeping with the beautiful residential site which the hillside affords.

From a conservative estimate of the outlook of Port Arthur's industrial development, the present building total of nearly half a million will be materially increased before the end of the year. There will be a big demand for workmen's houses, semi-detached, of about six rooms, which will rent for about $10 per month.

The corporation of the city have made a strong advance by permanently paving the business section this summer. At the present time 1,000 men are employed on the streets, and before the summer is over this section of the city, especially, will present a very modern and business-like appearance. As a matter of fact, the roadways throughout the residential district are all good, having a splendid natural drainage over and above the drainage system of the city.

There is now under construction the plant of the Western Dry Dock & Shipbuilding Company, who will spend $1,250,000. There are two other concerns under contract to start building operations very shortly, who will spend close onto $750,000 in building alone. The building permits for these will materially improve the outlook for the industrial development of Port Arthur.—N. G. Neill.

York County Will Have Good Roads

The good roads movement was considerably strengthened last week at Toronto when a committee composed of representatives from the Board of Control, the Board of Trade, and York County Council came to a definite agreement on the proper course to be pursued in constructing a system of good roads throughout the county of York. Among the resolutions was the following:

"That the city of Toronto and the county of York strongly recommend the voting of a grant of $100,000 each to be set apart for the purpose of improving the highways mentioned hereafter, so that the work can be commenced at the earliest possible date."

The roads to be improved are as follows: Yonge street, 13 miles; Kingston road, 9 miles; Kennedy road, 23¾ miles; Lake Shore road, 5¼ miles; Dundas road, 5¾ miles; Vaughan road, 14 miles; Weston road, 17 miles; Don Mills road, 6½ miles; east from Yonge street on Markham town line, 12½ miles; Malton road, 5 miles; total, 111¾ miles. The cost will be about $6,000 a mile, a total of $670,500, and the idea is to begin on 50 miles next spring.

A few prominent citizens of Toronto and the mayor and board of control held a conference recently with Mr. F. E. Townsend and some of his associates of New York, who propose to erect a large central terminal station in Toronto. Their plan is to provide facilities for water, steam and electrical transportation. The promoters of the proposal also interviewed the railway companies. After the interview they expressed themselves as well pleased with the prospects. Most of them left for New York. Mr. Townsend and Mr. H. B. Eakin remained behind and will open an office in Toronto for the preparation of detail

1910 Record Year at Winnipeg

Rapid Development of the Western Metropolis—Satisfactory Conditions in Building Trades and Supply Quarters

Office of the "Contract Record."
Winnipeg, August 13, 1910.

The first seven months of 1910 were the most remarkable in the history of Winnipeg, so far as the erection of residences is concerned. The Builders' Exchange, the building inspector, and the contractors agree that all records have been surpassed in this regard. Close upon 1,800 homes, varying in cost from one to ten thousand dollars, have been constructed right within the boundaries of the city, and fully as many more have been built in the immediate suburbs and are not included in the returns of the local building office. Incidentally there have been more of the higher type of dwellings erected than ever before. Houses ranging in price from eighty to twenty thousand dollars are being built by the dozens, and generally the class of building is greatly improved over previous years.

The old type of house with its four walls and gabled roof is becoming extinct and every new street opened up soon presents an array of thoroughly modern houses of original design and in good taste. This change has been brought about largely by the fact that almost every house bulit is erected for sale and probable purchasers will not consider roughness of design or construction.

It is estimated that about seven of the eleven million dollars represented in building permits issued here this year, have been for homes. This proportion, which equals about 60 per cent. of the total, is extremely large and further evidences the stability of enormous growth of the building trade in Winnipeg during this record-breaking year. An idea of the despatch with which contractors are doing their work may be obtained from the fact that a goodly percentage of contracts are now finished. This is noteworthy, seeing that it was well toward the end of April before work was generally started.

Apartment blocks have furnished the next largest portion of the building figures, although they were pressed closely by warehouses and general business blocks. By the end of this month the hotels and warehouses will take second position. Before the close of the year, Building Inspector Rodgers expects to see them take first place from the residences.

There are no signs of labor trouble of any consequence. Building material prices are quite normal and stocks are plentiful. There is no depression in any line worth noting.

The several big contracts which have been let are getting along well. The steel work on the Bank of Montreal building, and on the Orpheum Theatre is going ahead rapidly, and on the numerous concrete buildings in course of construction, cement is being dumped as fast as it can be hauled.

The biggest contract let recently was that for the McLaren Hotel, for Main street and Rupert avenue. This contract was awarded to C. W. Sharp & Son, at $175,000. The hotel will have 161 rooms. It will be seven storeys in height, the first storey of cut stone and the other six of pressed red brick. The rotunda will be finished in marble and the general interior fittings are to be of the very best procurable materials. The construction is to be absolutely fireproof. It is proposed to have the hotel completed by June 1st, 1911, and to make it one of the finest in Canada.

An interesting situation has arisen in Toronto in connection with a contract for the mason work on the new Earlscourt school, the contractors for which are Messrs. Teagle & Son, their tender having been for $13,000. This firm refused to complete the work and new tenders were called for. Ultimately a tender for $11,500 from Chas. W. Wood was accepted. The solicitor for the board claims that Messrs. Teagle & Son's deposit of $650 should be forfeited, but as the deposit has actually never been paid, the board will probably have to go without it, unless they can collect it by law. Messrs. Teagle & Son in explaining their actions state that the Board of Education had already on a previous occasion given them a raw deal in connection with a tender for the mason work on Brown school. Their tender for the work at $16,316 had been accepted but they say that subsequently they had been thrown down and the contract had been given to Orr Bros. Their action in connection with the Earlescourt contract was taken as a protest against their treatment in the Brown school matter. Some interesting developments may possibly occur before the matter is definitely settled.

Current Railway Notes

J. McMillan, of McMillan Bros., contractors for the first 70 miles of the main line of the C.N.R. west of Edmonton, states that his firm requires 500 more men and teams on its contract.

Three camps of C.N.R. surveyors are stationed between Port Arthur and Selwood, and they claim that their work will be completed during the coming winter, and that the laying of the steel can be commenced in the spring of 1911.

Work on the new Eastern Railway was commenced early in August by the turning of the first sod at Dartmouth, N.S. In order to complete the road as speedily as possible, the construction work will be divided up and the contracts sub-let.

Good progress is being made with the construction of the Canada & Gulf Terminal Raliway. Hugh Doheny has the contract for this work, his superintendent of construction being J. R. Cassidy, late superintendent at Harvey Junction for McDonald & O'Brien, contractors on the Grand Trunk Pacific. Mr. Cassidy is located at Little Metis, Que.

Railway contractors on the National Transcontinental Railway report great difficulty in securing an adequate supply of men for the construction camps. The recent action of the Government in removing the restrictions against the entry of navvies from the United States, has helped the situation somewhat, but along practically all sections of the line there is a great demand for more men.

Construction work was commenced at the end of July on the line of railway by which the Canadian Northern Railway contemplates tapping its coal areas on the Brazeau river, from Stettler, Alta., east of Lacombe. The surveys for the line have all been completed and 70 miles of the road are to be finished this year. The line will cross the C. & E. near Lacombe, and continue northwest into the Brazeau coal fields. It is the intention to have this line completed and in operation by the fall of next year. The line will be continued through the Brazeau fields to connect with the main line of the railway, at some point west of the McLeod river.

According eo a statement of C. C. Van Arsdol, chief engineer of the Pacific coast end of the Grand Trunk Pacific Railway, 240 miles at that end will be completed by next summer. According to Mr. Van Arsdol, rapid progress is being made from the Prince Rupert end of the road, in spite of the fact that not enough labor is procurable to carry on the work as fast as is desired by the engineers in charge. One hundred miles of grade have been completed, and the steel laid. Contractors and outfits are spread over the entire road for 140 miles farther into the mountains, and are rushing the construction as fast as possible. The construction of this end of the road is particularly heavy, owing to the

The Best HOIST in Canada

Note Well the Exclusive Features

The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

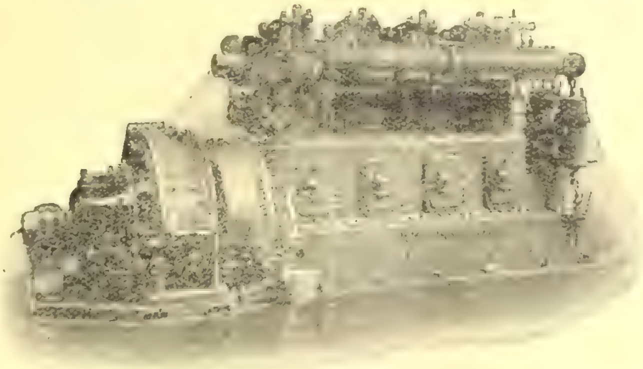
No Smell No Noise No Smoke

Suitable for Public and Private Buildings

THE MIRRLESS-DIESEL CRUDE OIL ENGINE

uses "Fuel," "Gas" or "Residual" oil

- No Ignition Gear
- No Vapourizer
- No Producer
- No Boiler
- No Chimney
- Self Contained



- Continuous Running
- No Breaksdown
- Cheaper Buildings and Foundations
- Unskilled Labour only
- No Standby Losses

HIGH SPEED

SLOW SPEED

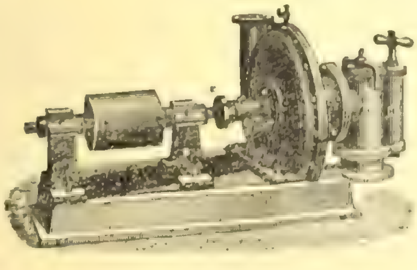
35 to 1000 B. H. P.

M. Beatty & Sons, Limited

Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.

fact that from within a very few miles of the coast terminal, the road runs east through a mountainous country, that is taking all the skill of engineers to conquer. Steel is following up the grade as fast as it is completed, and when the 240 miles have been finished early next summer east of Prince Rupert, the road will be ready for operation of work trains for that distance.

Personal News and Notes

H. E. Gates, architect, Halifax, N.S., has just returned from a four months' trip to the Mediterranean.

Mr. C. H. Mitchell, consulting engineer, has returned to Toronto from an extensive trip through the West.

Mr. A. McDonald, superintendent of the Eastern Construction Company, was a visitor to Ottawa last week.

The carpenters of Prince Rupert, B.C., have now been three months waging an unsuccessful strike for the eight-hour day.

Mr. Wm. Baldwin, a well known contractor of West Toronto, was seriously injured last week in falling from a pile of lumber.

The Ottawa Board of Control are considering a proposition to compel contractors to provide a 10 per cent. guarantee cheque with their bids.

Mr. George Buskard, private secretary to Hon. Robert Rogers, Minister of Public Works for Manitoba, is spending his vacation in Toronto.

Mr. George H. Bryson, assistant city engineer of Victoria, B.C., has resigned to accept a position with the Warswick Paving Company, of Victoria.

Mr. L. W. Klingner, of New York, has been transferred to Toronto, taking charge of Toronto work for the Foundation Company, Limited, of Montreal.

Industrial prospects at Ottawa are stated to be exceedingly good. During the last few weeks a great many inquiries have been received relative to factory sites.

Mr. J. M. Mercer, manager of the Northern Construction Company, the concern which has the contract for the coast section of the C.N.R., has removed with his family from Winnipeg to Vancouver.

The city engineer of Hull, Que., has forbidden the use of shingles for roofing buildings in that city. Several residences in course of construction that have been partially roofed with shingles will have to be completed with fireproof material.

A Fort William contractor, Mr. E. Peterson, is just completing what will probably be the first flying machine ever constructed in western Canada. Mr. Peterson's machine is a monoplane, similar in appearance to that favored by Count de Lesseps.

Dr. John Wm. S. McCullough, of Alliston, has been appointed secretary of the Ontario Board of Health to succeed Dr. Chas. S. Hodgetts, who recently resigned in order to accept a position with the Dominion Commission of Conservation.

Engineer Allan Hazen, of New York, the water purification expert, made another visit to Ottawa last week for the purpose of resuming his investigation into the water supply of that city. It is not expected that his complete report will be ready for over a month.

Applications are invited until Sept. 1st by M. Peterson, secretary of the Winnipeg Board of Control, for the position of Water Commissioner for the city of Winnipeg, to take complete charge of the operation of the domestic waterworks system. Applicants are asked to state experience and salary.

Honor for Ottawa Architect

Mr. Colborne P. Meredith, the well known Ottawa architect, has been appointed to succeed the late Mr. C. R. Cunningham on the Ottawa Improvement Commission.

The new commissioner was born in St. Andrew's, N.B., in September of 1871, being the son of the late E. A. Meredith, LL.D., former Deputy Minister of the Interior and for a time Under Secretary of State. Five years of his early life were spent in Ottawa, after which he resided in Toronto and acquired his schooling there. After taking two terms in the School of Science he entered the office of Mr. Frank Darling, and went to Ottawa in 1898. About four years ago, after the partnership of Band, Burritt & Meredith was dissolved, he opened an office for himself. He has been associate architect with Mr. Bradford Lee Gilbert, the eminent New York architect. For 19 years Mr. Meredith was active in military life. He is a reserve officer with the rank of major, having served in the Ottawa Field Battery.

Convention of Canadian Municipalities

Preparations have been completed for the 10th annual convention of the Union of Canadian Municipalities to be held at Toronto, Aug. 31st to Sept. 2nd. It is interesting to note that the Union held its first convention in Toronto in August, 1901. The following year the annual meeting was held at Montreal, and then came Ottawa, London, Winnipeg, Halifax, Fort William and Port Arthur, Montreal, Medicine Hat and Calgary in rotation. The executive regard this meeting as one of unusual interest. Many excellent papers are to be presented and the discussions following cannot fail to be of great practical benefit to all municipal officials. Special reduced fares will be available on the railroads on account of the Exhibition being in progress. Programmes for the convention may be obtained upon application to Mr. G. S. Wilson, 107 St. James street, Montreal.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope, and stating number of enquiry:

729. Metal lath and ceilings—A South African firm desires to be placed in touch with Canadian shippers of metal lath and ceilings. Quotations to be c.i.f. East London and Durban.

740. Wooden overmantels, etc.—A South African firm desires to be placed in touch with Canadian shippers of wooden overmantels, also closet seats. Quotations to be f.o.b. Montreal and St. John; ocean freight rates to Delagoa Bay and Durban.

813. Asbestos-cement sheets—A London engineer would like to be placed in communication with a reliable Canadian firm prepared to undertake the manufacture in Canada of asbestos-cement sheets, slates, tiles and other asbestos sheets.

The masons and bricklayers at work on the new Parliament Buildings at Regina are stated to have gone on strike because the contracting firm employing them "is involved in a labor dispute at Montreal."

Railway contractors, in spite of the recent relaxation of the immigration regulations in order to premit railway workmen to come to Canada, are experiencing great difficulty in securing men to do their work. They are complaining to the Transcontinental Railway Commission regarding the scarcity. Wages are fairly high, yet the dearth of available workmen has caused contractors yet with big jobs on their hands to register complaints at Ottawa.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

Specify in the Contract

"Metallic"

Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

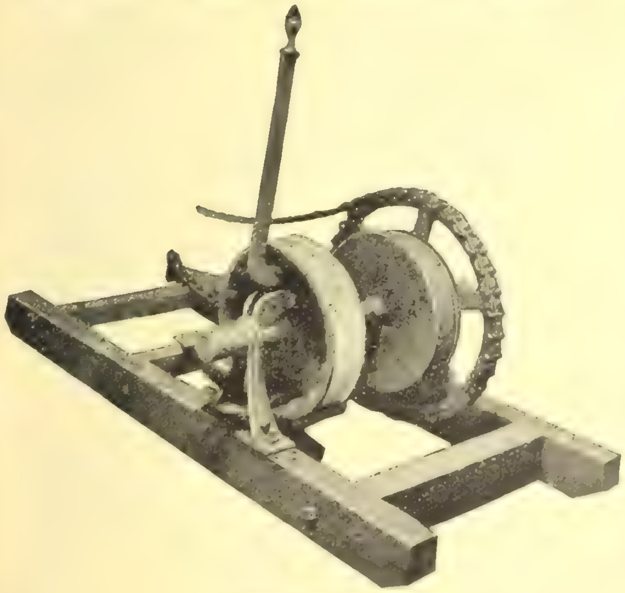
The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work
Bridge Building
Mortar Conveying
Sewer Building
Well Digging
Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

Sewer and Culvert **Pipes**

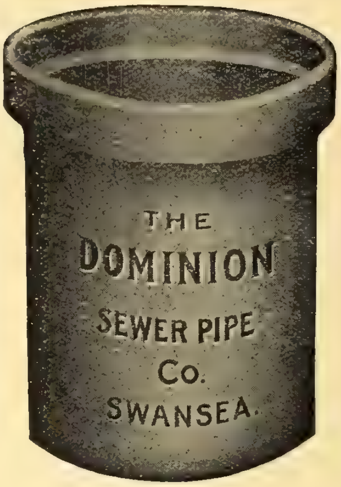
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe

Single and Double Strength. Sizes 3″ to 42″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

THE ENGINEER'S AIM

is reached by using

Hamilton Vitrified Salt Glazed Sewer Pipe

W H Y

Why do some Sewers and Drains excel in the Durability Test?
We Know Why

Why do some of the leading Contractors have such Good Success?
We Know Why

Why do most Dealers prefer handling the "Hamilton" Brand?
We Know Why

Why do we defeat our Competitors in Quality and Delivery?
We Know Why

W H Y

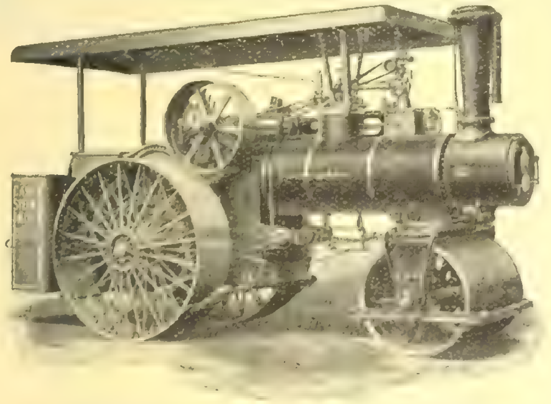
LET US TELL YOU

The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or Write us

Hamilton and Toronto

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba, Calgary, Alberta, Regina, Saskatchewan, Toronto, Ontario

Send for our Contractors General Purpose Engine and Municipal Tractor Catalog 26

The Calkins Tile & Mosaic Co., Limited

458 Bleury Street,
Montreal

Tiles

Mosaics

Ceramics

Quarries

Marbles

We handle all classes of work from the largest contracts to the smallest requirements of the marble and Tile trade. Write us for prices.

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

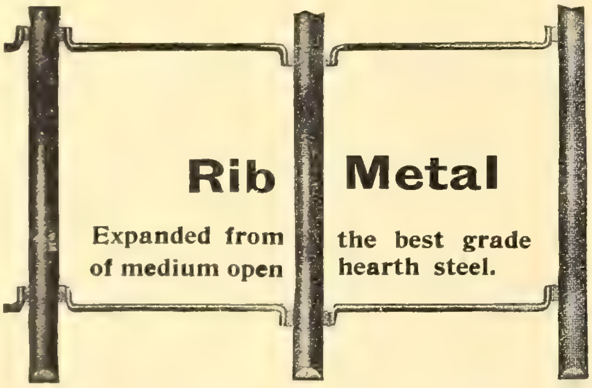
FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.

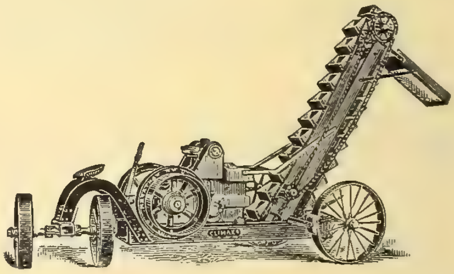

Rib Metal
Expanded from the best grade of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER-

All sizes ready for shipment.
Catalogues furnished on application.

The
Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

SUCCESSORS TO:
Canadian Iron & Foundry Co., Limited
Canada Iron Furnace Co. Limited
Annapolis Iron Co., Limited
John McDougall & Co., Drummondville

Head Office: Montreal, P. Q.

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc. Castings of All Kinds.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime.
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

"Galvaduct" and
"Loricated"
CONDUITS
For Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

SAND and GRAVEL
a Specialty

We have the above in various grades ready for immediate delivery.
Let us quote on your requirements

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North { 2107 658

Kawneer System
The Store Front
Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.** Limited
London, Canada
Toronto Office: 103 Pacific Bldg.

Handsome Ornamental Work
Made of Cement
This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read **The Cement Era.** The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.
1800 Monadnock Block - - CHICAGO

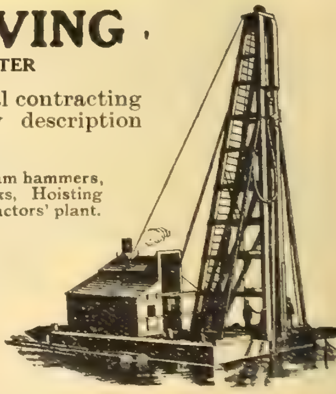
The Largest Cities and Smallest Towns use
W. E. Seagrave Fire Apparatus
MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING
LAND OR WATER
Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper, but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal. Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Sand & Supplies

LIMITED

Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite Crushed Stone and Sewer Pipe

M. 4507

Port Credit Brick

Is the leading building material of to-day because of the strength, color and quality. We make the following :

Repressed Wire Cut Brick
Common Wire Cut Brick
Pressed Brick
Paving Brick
Our prices will interest you.

Port Credit Brick Co.

Limited

Home Bank Building - Toronto, Ont.

Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.

Limited

Phone 423 and 2457

HEAD OFFICE :

Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry, Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

YOUR CARD

if placed on these pages would be among those of other men of high-standing.

We would be pleased to quote you rates.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St. Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$1.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.......	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

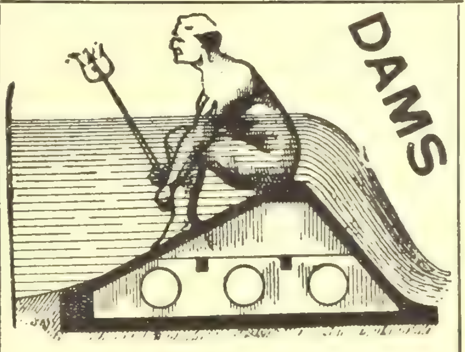
Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

It is stated that Joseph Gosselin, plasterer, Montreal, Que., has assigned.

John Ballantine & Company, Limited Preston, Ont., manufacturers woodworking machinery, sold out to Canada Machinery Corporation, Galt, Ont.

The B. C. Gazette gives notice of the incorporation of the following companies: Worswick Paving Company, Limited, capital $250,000; Laney Bros., Limited, capital $50,000, incorporated to carry on all or any of the following businesses, namely builders, contractors, plumbers, electricians, etc.; The Comox Sawmill Company, Limited, capital $25,000; Vancouver Artificial Stone & Brick Company, Limited capital [illegible]; Farmers' Lumber Manufacturing Company, Limited, capital $100,000; Electric Water Heater Company, Limited, capital $100,000; The Unit Building association, capital $100,000; The Columbia Valley Irrigation and Power Company, Limited, capital $500,000; Hallman & Peniston Machinery Company, Limited capital, $100,000.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greenville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**

AMERICAN

ALSEN

45 BROADWAY, NEW YORK

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

GERMAN

Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections

See page 155 in "Sweet's" for full particulars.

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

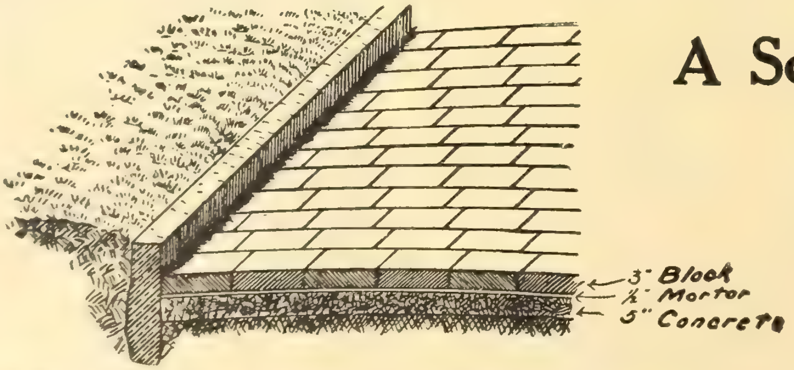
The Last Word in Wire Lathing

1910 Patented Trussed 1910

Wire Lath

FOR DESCRIPTION AND PRICES APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

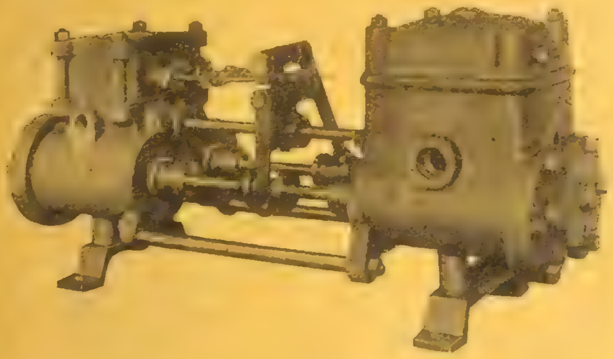
Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

Jas. Dickson, Pres. Geo. T. Dickson, Vice-Pres.

Dickson Bridge Works Co.

Campbellford, Ont. Limited

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings
Roof Trusses
and other Structural Steel

Foundry and Machine Shop in connection.
Estimates on application

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A 1. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

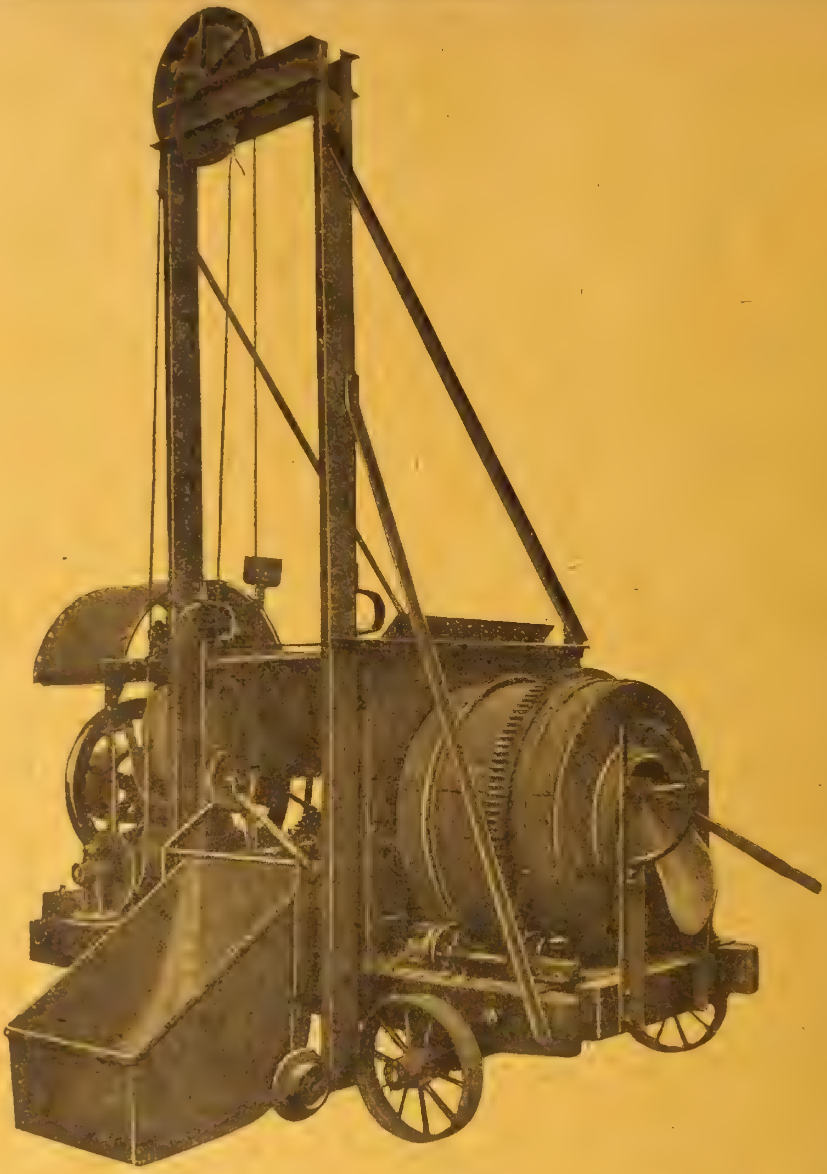
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



Ransome Street Concrete Mixer

The above cut illustrates our Street Concrete Mixer, designed especially for handling concrete quickly and efficiently. Three batches of materials are handled at the same time, but independently of one another. No delay whatever, a continuous stream of concrete is discharged, but each batch is mixed separately. No poor concrete—every particle well mixed.

Four of these Mixers are being used by Messrs. Laurin & Leitch, Contractors, Montreal.

Let us send you full particulars and prices.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, August 24, 1910 No. 34

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps, Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE

The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity—Efficient Regulation
Large Bearings—Rigid Construction

Ask for Descriptive Catalog K 84

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt

Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

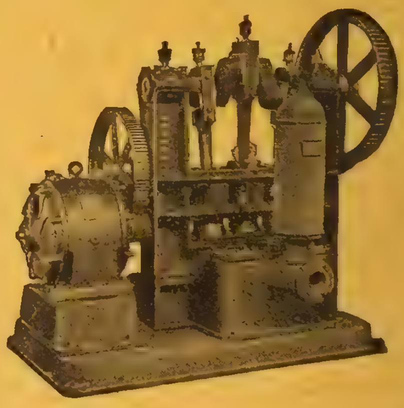
The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**

Phone Main 1054

Works: Seneca Falls, N.Y.

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work

	Page
Canada Wire Goods Mfg. Co.	15
Dennis Wire & Iron Works	16

Boilers

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Mussens Limited	32
Taylor-Forbes Co	63
Waterous Engine Works Co.	

Brick

American Enamelled Brick Co.	
Canadian Pressed Brick Co.	55
Don Valley Brick Works	7
Hamilton Pressed Brick Co.	10
Milton Pressed Brick Co.	
Port Credit Pressed Brick Co.	55
Toronto Pressed Brick Co.	

Bridges (Steel)

Canadian Bridge Co.	18
Cleveland Bridge Co.	18
Dickson Bridge Works	
Dominion Bridge Co.	18
Phoenix Bridge and Iron Works	19
Pennsylvania Steel Co.	18

Builders' Hardware

Taylor-Forbes Co.	63

Cement

Alsen Portland Cement Co.	62
Britnell & Co	16
Bremner, Alex	59
Canada Cement Co	3
McNally & Co., W.	55
Morrison & Co., T. A.	60
Rogers, Alfred	4
Rogers Supply Co.	31
Sand and Supplies	55

Conduits

	Page
Conduits Co., Limited	16

Concrete Mixers and Machinery

Canada Foundry Co.	14
Cropp Concrete Machinery Co.	6
Goold, Shapley & Muir	9
Hopkins & Co., F., H.	64
Jenckes Machine Co.	2
London Concrete Machinery Co.	21
Mussens Limited	32
Morrison & Co., T. A.	60
Rogers Supply Co.	31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co.	61
Buffalo Steel Co.	19
Canada Wire Goods Mfg. Co.	15
Hamilton Iron & Steel Co.	
Trussed Concrete Steel Co.	13

Contractors' Plant

Beatty & Sons, M.	51
Hepburn, John T.	17
H. & E. Lifting Jack Co.	
Hopkins & Co., F. H.	64
Katie Foundry Oo.	60
Marsh & Henthorn	51
Mussens Limited	32

Crushers (Stone and Rock)

Hopkins & Co., F. H.	64
Jenckes Machine Co.	2
Mussens Limited	32
Morrison & Co., T. A.	60

Corrugated Iron

Galt Art Metal Co.	
Metallic Roofing Co.	53
Metal Shingle and Siding Co.	20
Ormsby, A. B., Limited	5
Roofers Supply Co.	59

ontractors

	Page
McIlwraith, as. A.	60

Drills

Beatty & Sons, M	51
Canadian Rand Co.	1

Deafening Felts

Cabot, Samuel, Inc.	55

Drilling Contractors

Harvey, J.	61

Dredges

Beatty & Sons, M	51

Engines

Canadian Boving Co.	
Inglis, John	22
Jenckes Machine Co.	2
Mussens Limited	32
Waterous Engine Works Co.	

Excavators

Harris, J. W.	11

Electrical Apparatus and Supplies

Northern Electric & Mfg. Co.	34

Engineers (Civil and Mechanical

Barber & Young	60
Chipman & Power	60
Bowman & Connor	60
Davis & Johnston	60
Farmer, John T.	60
Fuce, Edw. O.	60
Galt Engineering Co., John	60
Glaubitz, H. J.	60
Hunt & Co., Robt. W.	55
Inglis, John	22
Lea & Ferguson	60
Mace, T. Harry	60
Mitchell, C. H.	60
McRae, John B.	60
Moore & Scollan	60

Fire Apparatus

	Page
Morrison & Co., T. A.	62
Seagrave, W. E.	16

Fireproof Doors and Windows

Douglas Bros.	51
Mussens Limited	32
Ormsby, A. B.	5

Granite and Marble

Laurentian Granite Co.	60
Missisquoi Marble Co.	
Rogers Supply Co.	31
Smith Marble & Construction Co.	

Glass

Chance Brothers & Co.	8
Consolidated Plate Glass Co.	
Luxfer Prism Co.	5
Thompson & Co., B. & S. H.	8
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E.	
Taylor-Forbes Co.	63

Hoisting Machinery

Beatty & Sons, M.	51
Inglis, John	22
Jenckes Machine Co.	2
Hopkins & Co., F. H.	64
Marsh & Henthorn	51
Mussens Limited	32
Scott Machine Co.	53

Hydrants

Canada Iron Corporation	59
Gartshore-Thompson Pipe Co.	58
Kerr Engine Co.	

Lime

Christie, Henderson & Co.	17
Jamieson Lime Co.	19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

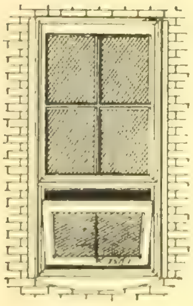
Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contracror who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited
100 King Street West, TORONTO



Our Fireproof Window is the result of six years scientific window building. We have skilled mechanics, the most modern machinery and we give this branch of our business close attention.

Specify the Ormsby "Underwriters" and you get the best in the market to-day.

A. B. ORMSBY, Limited
Experts in Fireproof windows and Doors
Factories - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish	Page
Batts Limited	53
Blonde Lumber Co.	16
Delaplante, Ltd.	20
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	63
Rhodes Curry & Co.	
Sanitary Floor Co.	15
Siemon Bros.	53
Standard Mills, Limited	62
Woodstock Lumber Co.	62

Metal Lath	
Galt Art Metal	
Metallic Roofing Co.	53
Noble C. W.	20

Meters	
Hopkins & Co., F. H.	64
Neptune Meter Co	15

Paving and Paving Materials	
Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	2
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster	
Albert Mfg. Co.	63
Britnell & Co	16

Pipe	
Canadian Pipe Co	58
Dominion Wood Pipe Co	9
Gartshore-Thomson Pipe Co	58
Municipal Construction Co	17
National Iron Works	59
Pacific Coast Pipe Co	1

Power Engines	
Inglis Co., John	22

Paints and Varnishes	
Cabot, Samuel, Inc.	55
Glidden Varnish Co	34
Paterson Mfg. Co.	

Pile Driving	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery	
Beatty & Sons, M.	51
Goulds Pump Co.	2
Hopkins & Co., F. H.	64
Inglis Co, John	22
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	57
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials	
Barrett Mfg. Co.	
Brantford Roofing Co	11
Galt Art Metal Co.	
Metallic Roofing Co.	53
Metal Shingle & Siding Co	20
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies	
Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery	
American Road Machinery Co.	14
Case Threshing Machine Co.	58
Climax Road Machine Co	58
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe	
American Sewer Pipe Co	56
Britnell & Co	16
Canada Iron Corporation	59
Dominion Sewer Pipe Co	56
Gartshore-Thomson Pipe Co	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co	10
Rogers Supply Co	31
Standard Drain Pipe Co	56

Sand	
Rogers Supply Co	31
Sand & Supplies	55

Stone	Page
Britnell & Co.	16
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	59
Corinthian Stone Co	15
Crushed Stone, Limited	57
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	57
Robertson, D	15
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	55
Wiarton Stone Quarry	61

Structural Iron and Steel	
Buffalo Steel Co.	19
Dominion Bridge Co.	18
Hamilton Iron & Steel Co.	
MacKinnon Holmes & Co.	
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H	19

Shovels (Steam)	
Beatty & Sons, M.	51
Hopkins & Co., F. H.	64
Mussens Limited.	32

Shingle Stains	
Cabot, Samuel, Inc.	55

Slate	
Roofers Supply Co.	59

Steel Shingles and Ceilings	
Galt Art Metal Co.	

Safes and Vaults	
Taylor, J & J	1

Sheathing Papers	
Cabot, Samuel, Inc.	55

Telephone Supplies	
Northern Electric & Mfg Co.	34

Tiles	
Smith Marble & Construction Co.	

Tanks and Stand Pipes	
Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	19

Typewriters	
United Typewriter Co.	62

Valves	
Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	
Standard Fitting & Valve Co	63

Ventilating System	
Gardiner & Gaskill	

Waterproofing for Cement and Brickwork	
Cabot, Samuel, Inc.	55

Wire Rope	
Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	12

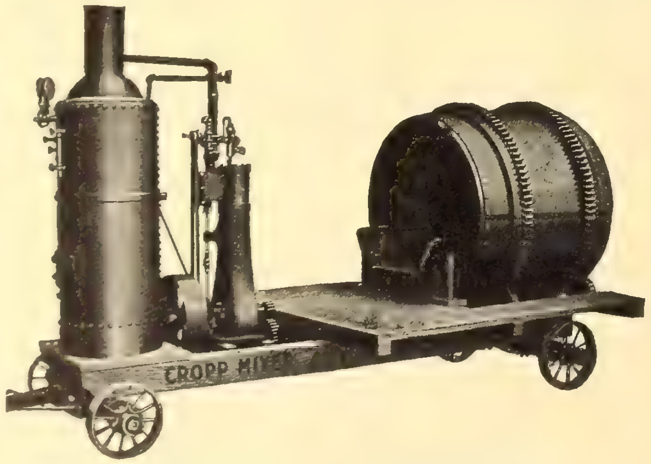
Wire Guards and Screens	
Canada Wire Goods Mfg. Co.	15

Water Wheels	
Canadian Boving Co.	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

The Goods with a Record

Don

Bricks

- Pressed Bricks
- Enamelled Bricks
- Vitrified Bricks
- Porous Terra Cotta Bricks
- Wire-Cut Bricks

Fireproofing

- Arches
- Blocks
- Column Covering
- Furring

Don Valley products have been the leading building material for many years. Their value is known.

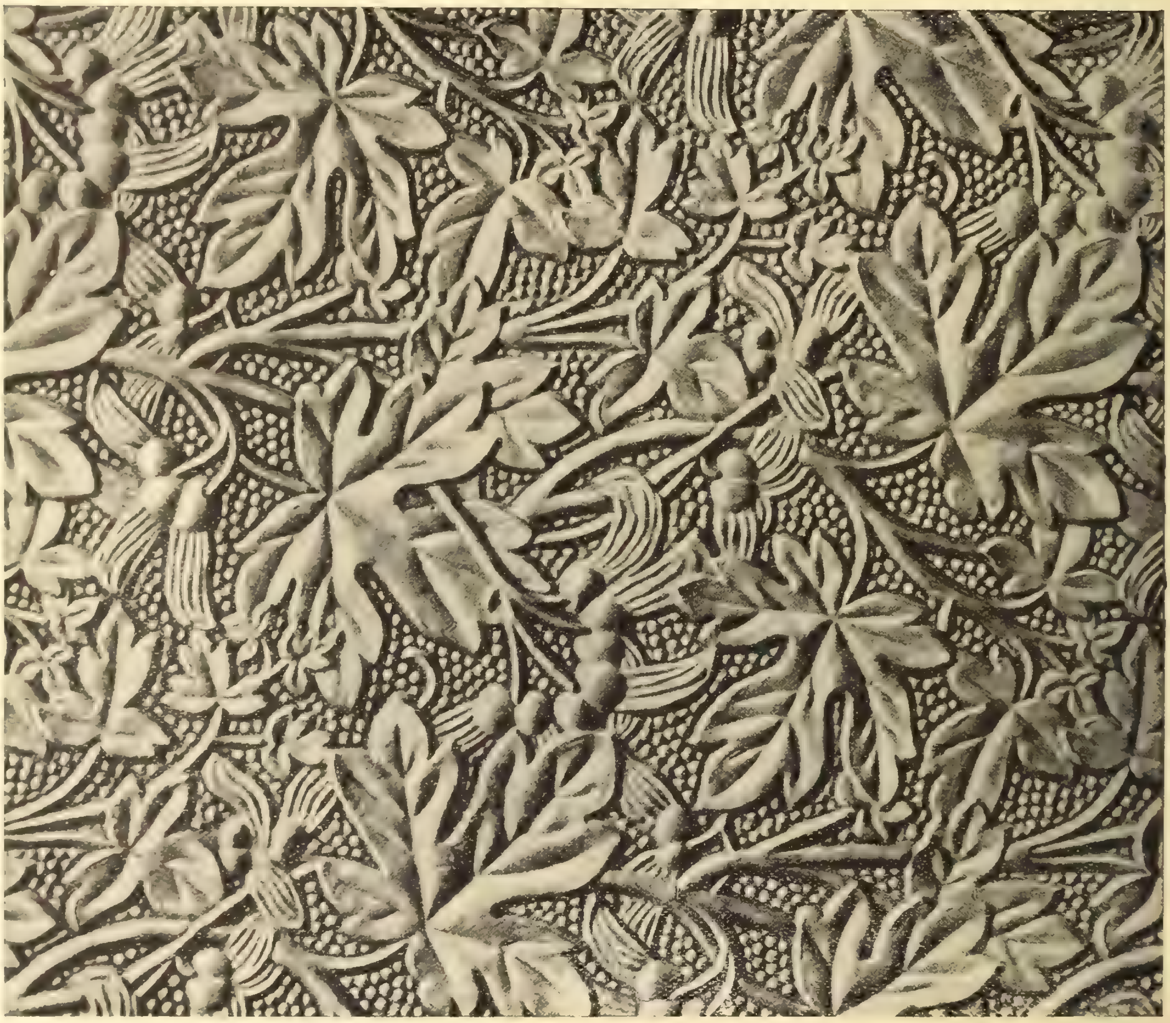
Don

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Chance's Famous Figured Rolled Glass



(Registered No. 545694)

To Architects, Builders and Contractors we will send, on request, samples of the Glass manufactured by CHANCE BROS. & CO., Limited, near Birmingham, England. Samples include Figured Rolled, Muffled and Rolled Cathedral Glass, in a variety of patterns and tints.

The "Maple Leaf" pattern, shown above, is one of our newest and most popular.

Write now for these samples. You'll probably find among them just the glass for which you have been looking.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

See it at the Toronto Exhibition

However difficult it might be to decide which was the **second best**

Double Wire Wound

Wood Stave Pipe

For Water Works Systems

everyone knows the **first best** is made by

The Dominion Wood Pipe Co.
Limited

A postal brings a catalogue

New Westminster, B. C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

VITRIFIED CLAY PIPE

Are the only permanent sanitary Pipe for Sewers. If you don't believe us (of course we must be prejudiced) read up the subject. There's plenty written on it.

Many towns and cities have bought experience dearly by putting in a substitute for **VITRIFIED CLAY.** If you want facts and figures, we can readily furnish them.

A fool learns at his own expense, the wise man at the expense of the other fellow. You wise **COUNCILMEN** ought to be sure of all your steps. Do not be misled by one man who thinks he knows. Ask of the great majority who do know.

THE ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Why Shingle a House when Brantford Roofing is better

Many builders and contractors, who have made a close study and inspection of the different classes of roofing materials on the market, recommend Brantford Roofing for use on dwelling houses as well as on factories and stores.

They do so, because Brantford Roofing makes a neat and attractive appearance on the roof;

Because Brantford Roofing makes a perfectly water tight roof;

Because Brantford Roofing will not melt in summer or turn brittle and crack in winter;

Because Brantford Roofing is fire-resistant;

Because Brantford Roofing is more than TWICE as durable as wooden shingles, yet costs no more.

Send for our big roofing booklet. It gives valuable facts about roofing materials.

Also ask us for samples of Brantford Roofing.

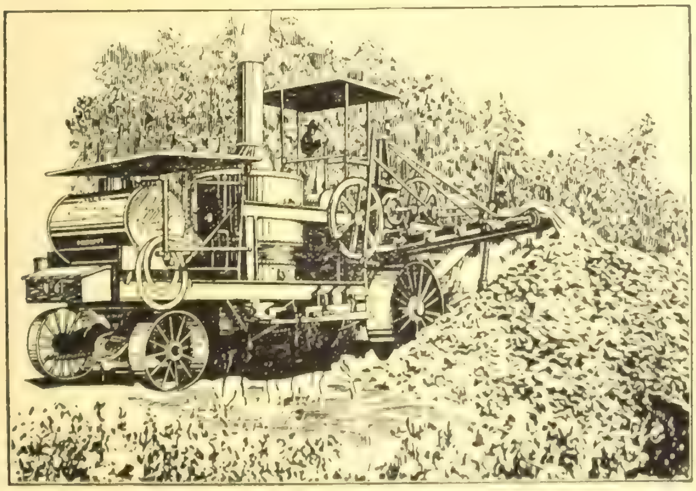
Brantford Roofing Company, Limited

Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS

EVANS, COLEMAN & EVANS, Vancouver, B.C.
ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man.
BAINES & PECKOVER, Toronto, Ont.

Canada's Largest Reinforced Concrete Building

constructed throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS—If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS—if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and Roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

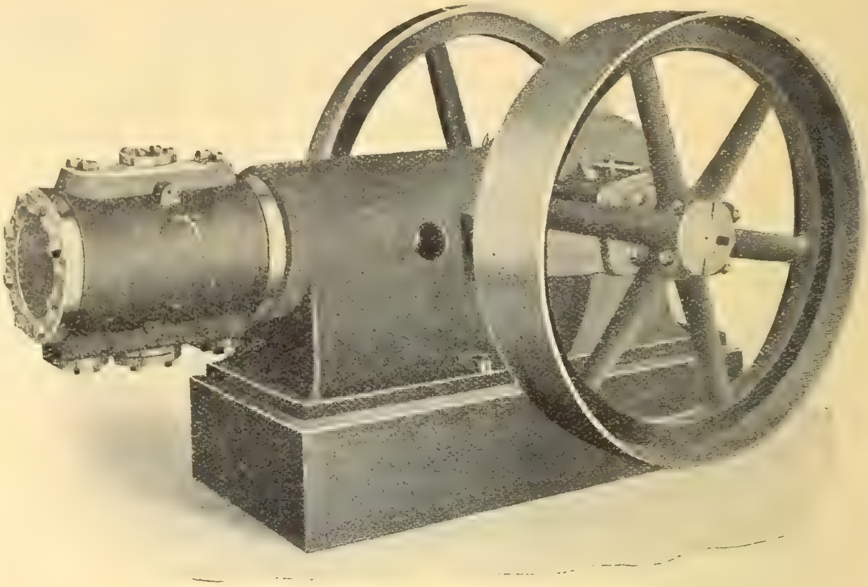
Branches: Toronto, Montreal, Winnipeg, Vancouver

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



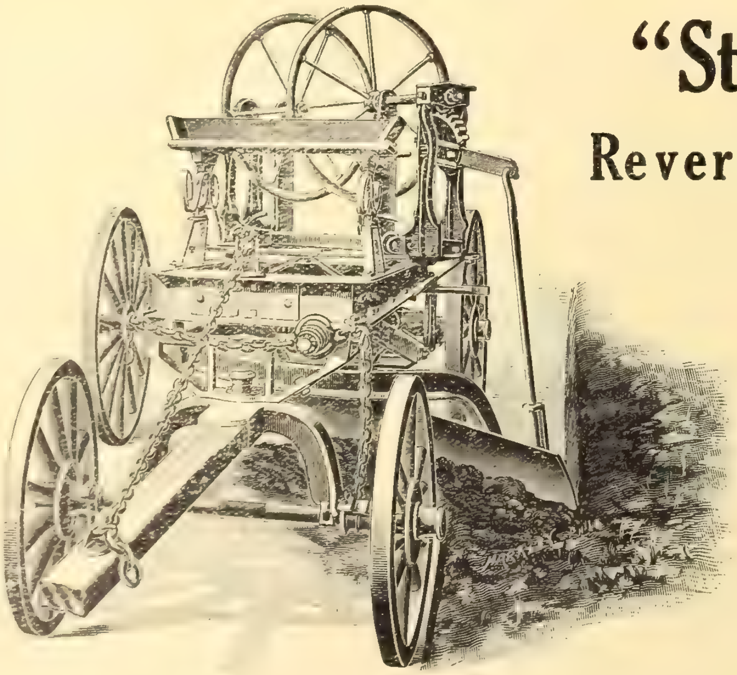
Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery

Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

Get our prices on our

CONCRETE REINFORCEMENT

Continuous lengths or in sheets cut to size

WINDOW GUARDS

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone

Company, Guelph

from the hardest substances available

Write the

Corinthian Stone

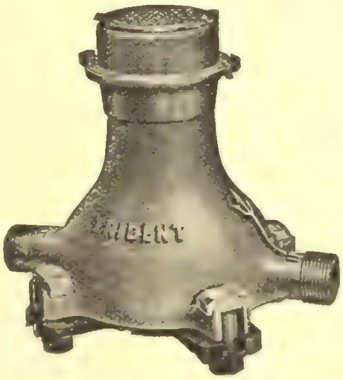
Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City

"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless, fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc. has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples.

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.

CUT STONE

All kinds of Canadian and American Stone

D. ROBERTSON & CO.

Limited

Offices
[illegible] Yonge Street, TORONTO
MILTON, Ont.

Yard
Manning and Dupont, TORONTO

Quarries
MILTON
CREDIT FORKS
[illegible]
[illegible]
[illegible]

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

EVERYTHING FOR THE BUILDER

SAND AND GRAVEL
SCREENED, PIT RUN AND PEA GRAVEL
BUILDING SAND

We can also ship promptly
Building and Crushed Stone
Lime, Cement, Fire Clay,
Plaster, Fire Brick
Hair, Sewer Pipe, Weeping Tile

Let us figure with you

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664, 665 Evenings, North 2107, 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**
London, Canada Limited

Toronto Office: 103 Pacific Bldg.

Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

We Are Extensive Manufacturers of

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

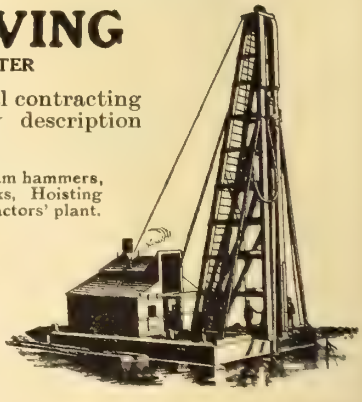
The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED
All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for
Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

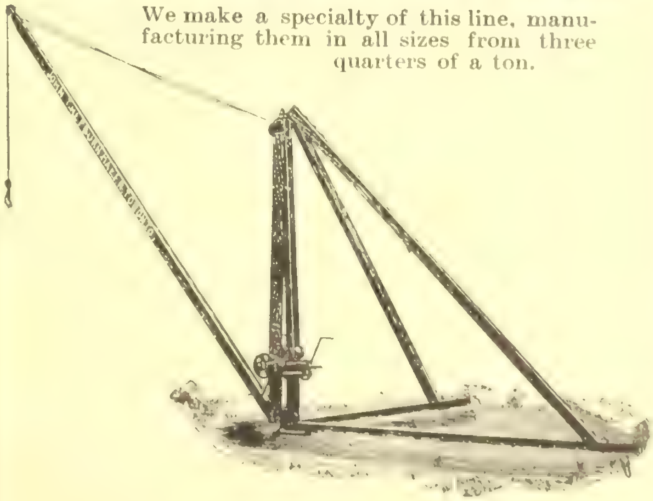
Roman Stone
(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks



We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.

Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 **TORONTO**
Branches Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

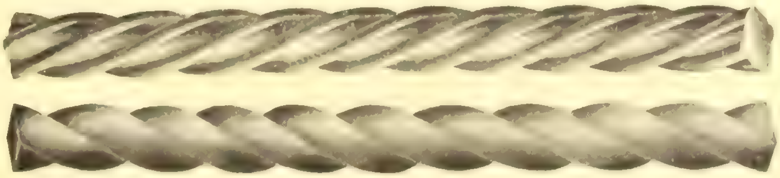
Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds
3-8 in. to
1 1-4 in.

Elastic Limit
50,000 lbs.
or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. Suburb of Buffalo, N.Y.

Toronto Office
117 Home Life Building

Think about this picture

This man is holding an ordinary sheet of twenty-seven gauge

Herringbone Lath

It is so stiff our competitors will tell you it's too stiff, and won't work easily around cornices.

It's only stiff across the ribs though. If the ribs run crosswise on the sheet it would hang down like ordinary metal lath. You only bend your sheet one way in cornice work.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

No. 872 is a Galvanized Steel Ridging at a "Wood Price"

Very few will choose to erect a wood ridge when the advantages of No. 872 are explained to them. It is much more ornamental than wood. And because it is made of galvanized steel it is several times as durable as wood. No. 872 is easy to erect. It is made on special machinery, in 10 ft. lengths, and is absolutely straight. The lengths fit together accurately. No wood filler is required. No. 872 is sold at practically the same price as ordinary wood ridge. Contractors who recommend No. 872 Ridge certainly use good judgment.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Monteral, P.Q. PRESTON, ONTARIO

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers

Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money | On the first cost of machine
On cost of operation
On cost of mixing concrete

Meet us at Toronto Exhibition, we will have the largest exhibit of Concrete Machinery ever shown (on the Ground south-east of Machinery Hall.)

We also manufacture a STANDARD DRUM BATCH MIXER in four sizes, 7 ft. 10 ft. 21 ft. and 31 ft. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent, 52½ Princess St., Winnipeg, Man.	Geo. B. Oland & Co. 28 Bedford Row, Halifax, N. S.	A.G. Brown & Co., 1048 Westminster Ave., Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada

---

CONTRACTORS' SUPPLIES

If you are in need of

Doors Ceilings
Sash Mouldings
Frames Stairs
Hardwood Flooring
(Empire Brand)

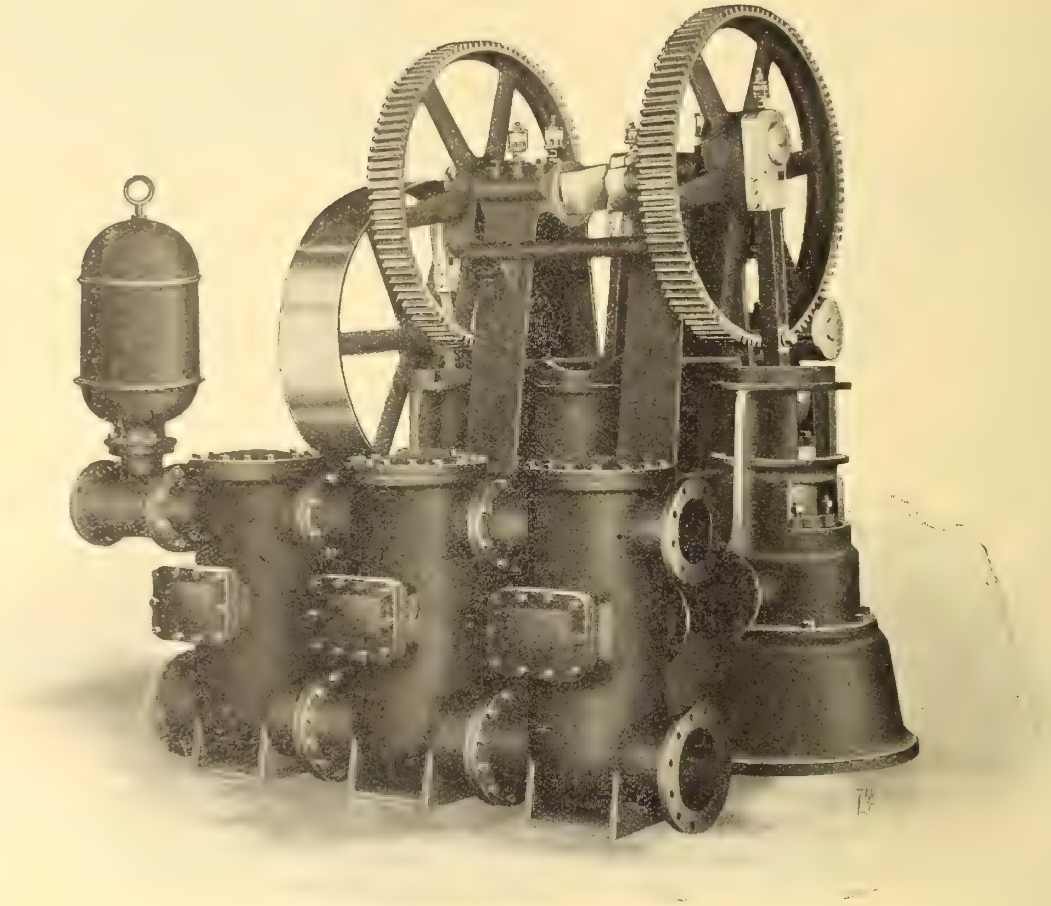
just let us know and we will ship your orders promptly. Mixed cars a specialty. We also carry Hemlock and Pine (rough or dressed.)

J. R. Eaton & Sons

Orillia, Ontario

Montreal Agent: C. A. SPENCER, 55 St. Francois Xavier St.

PUMPS



10 x 12 Single Acting Triplex Plunger Pump

We manufacture Pumping Engines of all types, Direct Acting Pumps, Geared and Centrifugal Pumps, also Special Machinery of all kinds.

Our Pumping Engines are in operation from coast to coast and are giving splendid satisfaction. We will be glad to refer prospective purchasers to any user of our pumps.

Photos, Prices and Specifications upon request

The John Inglis Company
ENGINEERS AND BOILERMAKERS Limited
14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Collingwood, Ont.

The tenders for pavement of 3,636 yards on Hurontario street according to material were as follows: Westrumite, $2 yer yard, $7,040; tarvia, $7,150.80; brick, $9,784.25; tar-lithic, $1.55 per yard, $5,536.80. The latter was recommended. K. S. Macdonnell, engineer.

Edmonton, Alta.

The commissioners have been authorized to collect data on cost of a hydro-electric plant on the Athabasca river, 100 miles north of this city.

Fernie, B.C.

The by-law to expend $32,000 on sewage and fire alarm systems was carried.

Hamilton, Ont.

The Board of Works is reported to have recommended that sewers be constructed for use of the Oliver Chilled Works, at a cost of $9,000.

Tenders will be received until August 31st at the office of the Burlington Beach Commission, Room 800, Bank of Hamilton Building, for the construction and filling in behind concrete revetment wall about 1,650 feet long, 7 feet at base, on the bay front at Burlington Beach. Plans and specifications of E. G. Barrow, consulting engineer, this city.

Moncton, N.B.

J. Edington, city engineer, has reported on the water supply, and his recommendations are being considered by tne Water and Light Committee of the City Council.

New Westminster, B.C.

The Municipal Construction Company, Vancouver, has secured the contract for laying the new steel main to Coquitlam Lake, which will supply water to this city and the municipality of Richmond. The 25-inch pipe line will be fourteen miles in length, and is calculated to discharge 250,000 gallons of water every 24 hours. There is already a 14-inch main tapping the lake, connecting with two reservoirs in the city, the high level one being at an elevation of 410 feet and the low level one at 250 feet. The tender price for hauling and laying the new pipe line is $125,000, and the total cost to the city will be $360,000. The work will take about a year to complete, and is in charge of A. R. Lewis, A.M.I.C., of the city engineer's office.

Ottawa, Ont.

The cost of the scheme to get the city water supply from McGregor's Lake, in the Gatineau district, some 12 miles north of the city, is placed at approximately $2,000,000.

The by-law for the new water supply from McGregor's and adjoining lakes may be submitted to the ratepayers at the next election. The estimates place the expenditure at about $2,000,000. The report of Mr. Allen Hazen, tne water expert, is expected in about a month.

Prince Albert, Sask.

Work will probably begin early next year on the proposed trunk sewer. F. A. Creighton, City Engineer. C. O. Davidson, City Clerk.

The city council have decided to submit to the ratepayers a $110,000 by-law for the construction of a sewage disposal system. Tenders will be invited in time to commence construction work next spring.

Regina, Sask.

Tenders will be received by the city clerk up to September the 8th for approximately 35,000 square yards of pavement, 19,000 lineal feet curb and gutter and 3,000 lineal feet of curb. L. A. Thornton, city engineer. For further particulars see "Tenders and For Sale Department" of this issue.

Tenders will be received up to September the 8th for approximately 140,000 square feet of concrete sidewalk. L. A. Thornton, city engineer. For further particulars see "Tenders and For Sale Department" of this issue.

Rainy River, Ont.

Tenders addressed to J. H. Wilson, town clerk, will be received until September 6th for the following: (a) Laying 300 feet of 15 inch sewer pipe, laying 650 feet of 12 inch sewer pipe, laying 650 feet of 10 inch sewer pipe, laying 1,700 feet of 9 inch sewer pipe, laying 350 feet flexible joint iron pipe, constructing 19 manholes, constructing 2 flush tanks, constructing 6 lamp holes, constructing pump house and installing macninery. (b) Laying 3,450 feet of 6 inch pipe, laying 1,100 feet of 8 inch pipe, laying 3,300 feet of 9 inch pipe. (c) Installing disposal plant. Plans at office of above.

Saskatoon, Sask.

Tenders will be received until September 8th for all works in connection with sanitary and storm sewers and sewage disposal works for buildings and ground of the University of Saskatchewan. Brown & Vallance, architects, Canada Life Building, Montreal.

Tillsonburg, Ont.

C. E. Raynes, town clerk, will receive tenders up to August 30th for the construction of a sedimentation tank for sewage disposal. Bell & McCubbin are engineers. For further particulars see 'Tenders and For Sale Department'' of this issue.

Vancouver, B.C.

Tenders will shortly be called for bitulithic and "Hassam" street paving; also for the construction of 2½ miles of cement sidewalks; also for wood block paving.

Weyburn, Sask.

Geo. [illegible], secretary-treasurer, will receive tenders up to August 31st for a sewer ejector station and sewage disposal works, etc. Chipman & Power, engineers. For further particulars see "Tenders and For Sale Department" of this issue.

Welland, Ont.

The ratepayers will again vote on a bylaw for waterworks extensions. The total cost of the proposed scheme is $52,000, and includes the following items: Plunger pumps, etc., $141,000; water wheels, $2,300; cast iron pipe, $9,100. Wm. Kennedy, jur., is the consulting engineer.

Winnipeg, Man.

The city has decided to construct four trunk sewers, and the districts to be benefited and the cost as it is divided among the various streets are as follows: District north of Polson avenue—Jefferson avenue, McPhillips, Red river, $275,690; McPhillips street, Jefferson, Selkirk avenue, $118,500; total, $394,190. Clifton district — Clifton, Portage, Sargent, $101,222; Lavinia, Clifton, Strathcona, $6,757; total, $114,736. District west of Clifton—Center from Assiniboine river to Portage avenue, $19,382. Ash street district—Ash street, Assiniboine river to Godfrey, $44,495; Godfrey, Cambridge street to Renfrew, $56,905; total, $101,400. Total for four districts, $629,708.

Tenders addressed to P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, will be received until September 14th for piping system and pipe tunnel and wiring ducts required in connection with the shops east of Winnipeg. Plans, etc., at office of Gordon Grant, chief engineer, Ottawa, and in the office of S. R. Poulin, district engineer, St. Boniface; also for wiring system required in connection with the locomotive shops of the National Transcontinental Railway east of Winnipeg.

AWARDED.

Buckingham, Ont.

Messrs. Wilson & Carriere, contractors of Hull, who have just completed their $38,000 contract for sewerage and waterworks in the city, have been awarded a contract amounting to $9,000, for the construction of a sewerage system here.

Hamilton, Ont.

A contract for building a sewer on Wentworth street was awarded to S. Cheesman at $1.15 per foot. The city engineer, who received contracts for Hilliard, Gilson and Niagara streets, will sublet them at the same price if possible.

Harriston, Ont.

D. B. Campbell, of Strathroy, received the contract for municipal drain construction, township of Minto, at $5,939. Other tenderers were Daniel [illegible], [illegible] at $[illegible],111, and Crowley & McDonald, [illegible], at $6,987.

London, Ont.

The contract for special castings for Huron street pumping station was let to the Gartshore-Thompson Company, Hamilton, at [illegible] cents per pound.

Moose Jaw, Sask.

The contract for supplying material and laying [illegible] lineal feet of [illegible]

[illegible] lineal feet of 12-inch cast iron water main was awarded to P. Kilkenny, of this city, at $[illegible]. J. Coleman, of Moose Jaw, also tendered at $14,550.

The contract for supplying materials for and construction of approximately 63,000 square feet of concrete walks; 9,000 lineal feet of combined curb and gutter; 6,000 square feet of concrete crossings, and 6 miles of wooden walks, was awarded to R. L. Frost, of Moose Jaw, at $15,330. W. E. Ramson, of this city, also tendered at $16,072, and the Western Pavers, Limited, Winnipeg, at $16,417.50.

Toronto, Ont.

The contract for sidewalk construction on Markham street was awarded by Barber & Young, 57 Adelaide street east, York Township engineers, to E. J. Elliott, 279 Main street, this city, at 48 cents per lineal foot. No other tenders were received and the council decided to call for fresh tenders to close August 29th.

The Board of Control awarded the following contracts for work in connection with the new addition to the city high level pumping station: Masonry, Brown & Love, $13,700; carpentering, George Henry, $2,299; plumbing, H. A. Johnston, $397; roofing, Flowers & St. Ledger, $425.

Vancouver, B.C.

Contracts for street improvements were awarded as follows: Paving Westminster road from Prince Edward street to Eighth avenue, bitulithic, R. S. Blome Company, $49,500; Cambie street, from Hastings street to Robson street, wood blocks, Christian & Hartney, $29,411.35. Other tenderers: T. R. Nickson, $35,500; Palmer Bros. & Henning, $31,750; M. P. Cotton, $34,844. Asphalt paving on First avenue, from Yew to Macdonald, Independent Asphalt Company, $43,800; other tender, M. P. Cotton, $54,000. Westminster avenue, south of bridge, paving, Palmer Bros. & Henning, $9,994.20; paving Abbott street, wood blocks, south from Water street, Higman & Doctor, $2,900; other tender, M. P. Cotton, $3,159. Evans, Coleman & Evans were given the contract for supplying cement at $2.45 a barrell.

H. V. Tucker, of this city, has been awarded a contract for partially grading Tenth avenue at 62 cents a cubic yard. This work is in connection with electric railway construction at Point Gray.

Macdougall & Company, this city, have been awarded a contract for the construction of $50,000 worth of sewers in Nanaimo, Vancouver, Island, at $48,346. The work is to be completed within ten months. The estimate of the city engineer was $50,000. The tenders received were as follows: Pacific Coast Construction Company, Victoria, B.C., $74,945; James C. Kennedy, Vancouver, $71-205.25; Hugh Macdonald, Victoria, $59,523; John W. Moore, jr., Victoria, $53,751; Macdougall & Company, Vancouver, $48,346.

Welland, Ont.

The lowest bid for the Lyon's Creek drain was submitted by A. D. Brown, Welland, who will probably receive the the contract at $5,976. Walker Bros., Thorold, bid $6,138.

Railroads, Bridges and Wharves

Camrose, Alta.

Tenders for construction of C. N. R. from here to Strathcona, it is stated, have been found too high.

Edson, Alta.

The Grand Trunk Pacific has laid out extensive yards at Edson for the accommodation of its general railway traffic. Five miles of sidings will be built at once, but the yards as laid out provide room for twenty-six miles.

Edmonton, Alta.

The Canadian Northern Railway has applied to the Dominion Government for a charter for a railway to run from Edmonton to Bead River, on the Portland Canal, which is part of the British Alaska boundary. The proposed route would give the Canadian Northern shorter haul to tidewater than the Grand Trunk Pacific to Prince Rupert.

At a meeting of the city council last week tenders were submitted for the construction of the Great Ravine bridge and were referred to the city engineer for report. The bids were as follows: Dominion Bridge Company, per Gorman, Clancey & Grindley, $29,702; Canadian Bridge Company, per Walker & Barnes, $46,950 (with one sidewalk, $46,150); Structural Steel Company, per Walker & Barnes, $46,000 (with one sidewalk, $45,100); Algoma Steel Company, $29,300.

Joliette, Que.

Plans for a line connecting Montreal with the Transcontinental Railway by way of Joliette have been filed at the Railway Commission at Ottawa, Ont., by the Joliette & Lake Manan Railway Company. The line is to start from Joliette and run to Weynoutachene on the Transcontinental. The general route as far as Lake Manan has been approved and a location made for ten miles of the way filed. Above the lake the line has not yet been located.

Montreal, Que.

The Montreal & Southern Counties Railway Company, W. B. Powell, general manager, Montreal, Que., is to start work shortly on an extension to the Richelieu river, connecting Montreal and St. Lambert with Chambly Basin, Chambly Canton and the village of Richelieu, and intervening parishes. Later on the railway is to be extended to Granby. The company has also secured a long lease from the Central Vermont Railway, from Montreal to Waterloo, and will electrify about nine miles of the track.

North Vancouver, B.C.

The by-laws on the principle of purchasing bridge shares and also $100,000 of bridge stock were carried by the ratepayers.

Ottawa, Ont.

A syndicate headed by R. T. Shillington, member of Parliament for the Porcupine District, is reported to have been granted a charter to build a line from the T. & N. O. Railway to the Porcupine district. Construction work is to be started this month on the Hudson Bay & Pacific Railway. The survey for the road is now out over 100 miles and the road is surveyed ready for construction work for a distance of 85 miles. The engineering headquarters of the road are at Prince Albert, Sask.

Prince Rupert, B.C.

The Grand Trunk Pacific Railway Company will erect at Prince Rupert a dry dock with a lifting capacity of 20,000 tons at a cost of $1,500,000, and a marine depot at a cost of $200,000.

Port Arthur, Ont.

The city, G. T. P. and C. P. R. officials had a conference here last week. This, it is believed, will result in an arrangement for making Port Arthur the headquarters of passenger traffic for the three lines at the head of the lakes. A union station and new docks are among the possibilities.

Regina, Sask.

The G. T. P. have purchased a site of fram 15 to 20 acres for their proposed new shops here. Construction will commence upon the approval of the company's plans by the city council.

Stewart, B.C.

Advices from this place state that the Canadian Northern Railway, which recently applied for a charter for a railroad from Edmonton, Alta., to Stewart, is now considering the construction of another railroad from Stewart branching through Portland City up the Salmon river through 20 miles of Alaskan territory into British Columbia.

St. Boniface, Man.

Plans for the proposed subway to be built on Tache street were submitted to the city council last week by the Canadian Northern Railway. The plans provide for the construction of a 40-foot subway to be built entirely at the expense of the railway company. The plans were referred to the city solicitor for approval before final consideration by the council.

Vancouver, B.C.

C. N. R. surveyors will proceed immediately with the work of laying out the townsite of Port Mann for terminals and car shops.

Harris & Bull, this city, have given notice of an application to the Legislative Assembly of British Columbia for an Act to incorporate a company with power to construct a railway from Vancouver city westward and southeasterly through Point Grey, South Vancouver and Burnaby to the city of New Westminster.

Windsor, Ont.

The Grand Trunk is preparing to improve its roadbed in Western Ontario by laying ninety-pound rails in use now. A cargo of the new rails has been unloaded at the company's docks here. The tracks between Windsor and Chatham are to be replaced with the heavier rails this year, and it is expected the work will be pushed as far as London next year.

Winnipeg, Man.

See "Power Plants."

It is reported that the C. N. R. will erect a large roundhouse, storehouse, warehouse and freight sheds at St. Boniface. It is proposed to share the Union depot there with the G. T. P., and build a new traffic bridge across the Red river from Winnipeg. The total improvements will cost over a million dollars, the work to be completed within two years. The necessary arrangements have been made with the council.

The material from the old Louise bridge has been donated by the city council to the parks board and will be re-erected as a connecting like between Assiniboin Park and Portage avenue at a cost of $10,000.

AWARDED.

Brown Hill, Ont.

The contracts for the construction of a 55-foot clear span steel bridge over the Black river near here were awarded as follows: Concrete abutments, Jesse Winger, Edgeley, Ont., $1,628; other tenders being $2,586 and $1,836. The steel superstructure was originally designed to carry a 15-ton roller and the tenders on this design were as follows: J. Vance, New Hamburg, $1,093, other tenders being $1,900, $1,608, $1,500 and $1,514. The tender of Mr. Vance was accepted, but he subsequently withdrew and new tenders were called for on a modified design capable of carrying a 10-ton roller. The tenders on this design were as follows: Hamilton Bridge Works

Company, Hamilton, Ont., $1,418, other tenders being $1,350,$1,515, $1,429 and $1,760. Barber & Young, engineers.

Lundalk, Ont.

For the construction of a reinforced concrete bridge over the Saugeen river, John Walker, of Owen Sound, Ont., was given a contract by the township of Glenelg, at $1,600. Other bids were: Atkinson & McNab, contractors, Durham, $2,000; J. J. Zettler, contractor, Walkerton, $2,350; William Moore, contractor, $2,700.

Edmonton, Alta.

The local contracting firm of Pennie & Kerr were awarded the sub-contract for all the excavation work on the C. P. R. high level bridge here.

Fort William, Ont.

The C. P. Railway Company awarded the contract for piers, abutments and pedestals for bridge over the Kaministiquia river to O. A. C. Stewart & Company, Winnipeg.

Galt, Ont.

The tender of Hancock & Thomas has been accepted by the city council for the erection of the Kerr street and Ainslie street concrete bridges.

London, Ont.

The Middlesex county council have awarded contracts for a bridge over the Aux Sable river for the steel to the Hamilton Bridge Works and for the cement work to R. Walton, of Kerwood, Ont.

St. Boniface, Man.

A contract to build a culvert over the Seine river at Provenchre avenue was awarded to Guilbault & Company at $27,510.

Vancouver, B.C.

The contract for constructing a slip at the foot of Balsam street was awarded to Armstrong, Morrison & Company at $7,835. The tenders were as follows: Ironsides, Rannie & Campbell, $9,796; Higman & Doctor, $10,720; H. V. Tucker, $11,985.

Public Buildings, Churches, Schools, etc.

Dubuc, Sask.

Tenders addressed to J. L. Bartley, secretary treasurer, will be received until August 31st for the erection of school here. Plans, etc., with above, or at office of Storey & Van Egmond, architects, Regina.

Halifax, N.S.

The city council have selected a site for a market building.

North Vancouver, B.C.

The by laws to raise $10,000 for new school was carried.

Ottawa, Ont.

The headquarters of the Golf Club will be completed by October 1st. Horwood, Taylor & Horwood are architects.

C. P. Meredith, architect, is calling for tenders for fixtures for the city hall.

Weeks & Keefer, architects, are calling for tenders for the fire station.

Quesnel, B.C.

This town is discussing a new fire hall and modern fire apparatus. A by law to that effect will be voted on soon.

St. Andrews, Man.

Tenders are being called until September 3 for erection of municipal hall. Plans at office of F. R. Evans, architect, Winnipeg.

Stratford, Ont.

At a meeting of the city council last week a by-law to raise $5,000 for an isolation hospital was introduced and passed.

St. Vital, Man.

A by-law authorizing the issue of debentures for the sum of $20,000 for the erection of school will be submitted to the ratepayers on August 25th.

Toronto, Ont.

The congregation of Grace Anglican Church, Elm street, have decided to sell their building and erect another on a new location.

Vancouver, B.C.

Tenders addressed to W. Ferris, secretary, school board of South Vancouver, will be received until August 25th for the erection of an 8-room brick and stone school building at Cedar Cottage, South Vancouver. Plans and specifications at office of J. H. Bowman, architect, 112 Crown Building, city.

Wallaceburg, Ont.

On September 6th the ratepayers will vote on the raising of $20,000 in debentures for school purposes.

AWARDED.

Calgary, Alta.

The Otis-Fensom Elevator Company were awarded a contract for the installation of an elevator in the city hall at $5,400.

Granby, Que.

For the installation of heating, plumbing and ventilation at the college and convent here, the Roman Catholic School Commission received five bids. Up to date, contracts have only been awarded for heating, the successful tenderers being: for the college, T. Lessard & Sons, Limited, Montreal, and for the convent, W. J. Walker, Granby, Que. Architect, Jas. Sawyer, Montreal.

Maisonneuve, Que.

Contracts have been awarded as follows for the construction of the new Town Hall: Masonry and brickwork, Messrs. Perrault & Audy; reinforced concrete floors, E. Loygnon. Mr. C. Dufort, architect.

Montreal, Que.

Contract for the additions to the All Saints' Church, Marie Anne and St. Denis Boulevard, has been awarded to John Wighton, general contractor; Messrs. Cox & Amos, 112 Mansfield street.

Nanaimo, B.C.

The local lodge I. O. O. F. has awarded the cotnract of building the new hall to Mescher Bros., of Victoria, whose tender was $29,310; the contract for heating the building being awarded to Messrs. Macdonald & Perry, of Vancouver.

Orillia, Ont.

The contract for the erection of Sunday School for the Baptist Church here has been awarded to W. L. Bennett. this town, at $5,000. J. H. Robertson, Orillia, architect.

Winnipeg, Man.

The contract for the erection of the two police sub-stations has been awarded to John McQuarrie, this city, at $54,000. E. H. Rodgers, Inspector of Buildings, architect.

Residences

London, Ont.

Mr. Jno. Hayman is contemplating the construction of a large apartment house on Wellington street.

Niagara Falls, Ont.

The residence of Chas. Weir was destroyed by fire last week at a loss of $5,000

Ottawa, Ont.

James Mather, this city, is the architect for the residence to be erected for Admiral Kingsmill at Rockliffe. It will be a limestone structure, and the estimated cost is $20,000. Holbrook & Sutherland have the general contract.

C. J. Burrett, architect, has been instructed to prepare plans for a residence for John McDonald in Carleton Place.

Among the building permits recently issued are: J. B. Larkin, dwelling, York street, $3,000; H. Nesbitt, dwelling, Florence street, $2,700; Dr. Ami, alterations, Laurier avenue east, W. G. Adamson builder, $3,000; Christian Neilson, Hawthorne avenue, dwelling, $2,500; Robert Edmondson, dwelling, $2,500, Blackburn avenue; W. E. Hunt, dwelling, Arlington avenue, $5,100; T. C. James, dwelling, Driveway, W. E. Noffke, architect, $12,000.

J. A. Ewart, architect, is calling for tenders for a residence for E. J. Campbell on Stewart street, to cost about $5,000.

Toronto, Ont.

Tenders addressed to F. S. Baker, architect, this city, will be received until August 27th for all trades required in the erection of a residence in Eglinton.

Victoria, B.C.

J. McLaren, dwelling on Trutch street, to cost $4,000; Gus A. Porter, dwelling on Linden avenue, to cost $3,500.

AWARDED.

Brandon, Man.

J. A. Twiss was awarded the contract for building a residence for E. L. Stady, on Fifteenth street, at a cost of about $5,000.

Montreal, Que.

Contract for alterations to property on Peel street for the Geo. A Drummond Estate has been awarded to Bonnell Bros., contractors, Guy street. Architect, Geo. T. Hyde, 157 St. James street.

Sir Robert Lucas is erecting a residence a Lachine, Que. Masonry contract awarded to John Wighton, contractor, Sussex street. Carpentry awarded to U. Pauze & Fils, Limited, Greene avenue. Architect, H. C. Stone, 84 St. Francois Xavier street.

Ottawa, Ont.

C. and W. H. Lester have been awarded the contract for masonry and brickwork in connection with alterations to Dr. Klotz residence, corner of Somerset and O'Connor.

The following contracts have been awarded for the residence of W. E. Noffke, architect, is erecting on the driveway: T. C. James, mason and brick work; Smith Brothers, carpentering; Kelly & Ferguson, painting; Currie & Livock, plumbing; John J. Green, plastering. The building will cost $14,000.

Weeks & Keefer, architects, have awarded the contract for the construction of Dr. J. E. Taggart's residence on Clemow avenue to A. Slack. The cost will be about $11,000.

Business Buildings and Industrial Plants

Aylmer, Que.

Bailey's lumber mill here was destroyed by fire on the 18th inst. Estimated loss, $10,000.

Blackville, N.B.

McLaggan Bros.' saw mill here was destroyed by fire on the 19th inst. Estimated loss, $10,000.

Battleford, Sask.

Plans have been competed for a new Dominion lands office and post office to be erected here at a cost of $100,000.

Balfour, B.C.

It is expected that an early start will be made on the G. T. R. hotel here. Foundation work will be proceeded with as soon as the revised plans are received from Montreal.

Calgary, Alta.

The Calgary Milling Company's plant was damaged by fire last week to the extent of $20,000.

Cobourg, Ont.

The town council has entered into an agreement with the International Tool Company of Toronto for the establishment of an industry in this town. Work is to be commenced on the plant within ninety days, and it is to be in operation in nine months' time. Secretary, Mr. Chapman.

Edmonton, Alta.

Tenders addressed to the City Commissioners will be received until August 29th for the erection of extension to the car barns.

Gracefield, Que.

Campbell & Stearns, formerly of L'Orignal, are preparing to erect a saw mill here at a cost of $25,000.

Hamilton, Ont.

It is stated that the Guelph Specialty Company will open a branch here and that the Canada Reflector & Mirror Company of Pittsburg has decided to locate here.

The Hamilton Bridge Works Company have purchased ten additional acres to provide for future expansion.

Londonderry, N.S.

Fire last week destroyed the machine shop of the Canada Iron Corporation at this place. Loss $15,000.

Longueil, Que.

Plans are nearly completed for the new military school which the Government plans to build here.

London, Ont.

J. H. Chapman & Company will make extensive alterations to their store in the near future.

Moncton, N.B.

The store building owned by S. B. Leblanc, at Legeres Corner, near this city, was burned down last week at a total loss of $9,000.

Medicine Hat, Alta.

The Alberta Iron Rolling Mills have signed the agreement to install their $100,000 plant in this city this fall.

Montreal, Que.

The permit has been issued for the new C. P. R. depot at Mile End, to cost $37,[illegible].

The National Acme Manufacturing Company will erect a new plant in Montreal. Plans and specifications to be seen at the Builders' Exchange, 263 St. James street, Montreal.

It is stated that J. A. Jacobs is planning the erection of a large hotel on the site of the Scroggie departmental store, which he has acquired. Estimated total cost of building and equipment, $1,000,000.

Napanee, Ont.

The barns of W. H. Hunter were destroyed by fire last week at a total loss of $10,000.

Orillia, Ont.

The Canadian Refining & Smelting Company have definitely decided to establish a factory here. The town is giving the company a site of about 9½ acres.

Osgoode, Ont.

The premises of the Union Bank, Nixon's livery stable, Boyd's general store and other buildings were destroyed by fire last week at a total loss of $20,000.

Ottawa, Ont.

A charter has been granted to the McLaughlin Paint Company, which has located on Armstrong street, and is making arrangements for erecting larger premises.

Maass Brothers have purchased a large lot on Irvine avenue, and will erect a machine shope on it, to cost about $5,000.

James Mather, architect, is preparing plans for a new bakery for Slinn-Shouldis, Limited. The building will be erected on Catharine street. It will be of solid brick, two storeys and a basement, and 231 feet by 120 feet. He will call for tenders in ten or twelve days.

Portage la Prairie, Man.

The Rat Portage Lumber Company are planning to start the erection of a new planing mill here this fall.

Peterboro, Ont.

The Canadian General Electric Company are calling for tenders up to September 6th for the various trades in connection with the company's machine shops here. For further particulars see "Tenders and For Sale Department" of this issue.

Sudbury, Ont.

A. W. Fraser, of Ottawa, is authority for the statement that the contract has been given to a Minneapolis firm for the erection of a 2,000 barrel flour mill and grain elevators at this place.

St. John, N.B.

The Dominion Iron & Steel Company are said to be negotiating for control of the Pender Nail Works here. This would probably mean considerable extension.

St. Catharines, Ont.

Tenders addressed to A. E. Nicholson, architect, will be received until August 31 for erection of office building for the Security Loan & Savings Company .

Sandwich, Ont.

Ratepayers have authorized the granting of special inducements to the Canadian Salt Company, in order to secure the big chemical plant which will probably be operated in connection with the present Windsor plant. The town will grant the company a fixed assessment of $35,000 for ten years and in return will secure a plant valued at about $250,000.

Toronto, Ont.

The Board of Education will receive tenders up to August 26th for the enlargement, fittings and supplies of various schools and collegiates in the city. For further particulars see "Tenders and For Sale Department" of this issue.

The carriage works of Cottrell & Rigby were burned last week. Estimated building loss, $2,000.

Tenders will be received until the 27th inst. for brick work, cut stone, structural steel and all carpenter work required in the erection of an office, warehouse and elevator building for "Faramel, Limited," to be erected on Dupont street. Plans and all particulars can be obtained at the office of F. H. Herbert, architect, 65 Adelaide street east, Toronto.

Victoria, B.C.

It is stated that the Victoria & Sydney Railway Company will build new office quarters on Blanchard street, at a cost of $17,500. Dinsdale & Malcolm are the contractors.

It was practically decided at the meeting of the civic health committee that the building of the isolation hospital on the reserve opposite Barnet should be deferred until next year.

Vancouver, B.C.

The Dominion Bond & Trust Company, this city, will erect a fourteen storey business block to cost half a million on the southwest corner of Granville and Cordova streets, opposite the C. P. R. station.

The Vancouver Milling & Grain Company will erect a new 100,000 bushel elevator, 94 feet in height, and a new warehouse, on Smythe street. Both buildings will be constructed of reinforced granite.

Windsor, Ont.

It is proposed to build a new Federal building on a different site.

The Imperial Bank is seeking a building site here.

Negotiations are under way by Border Chapter, Daughters of the Empire, for the purchase of the Iler homestead, on the Huron-Sandwich line, as the site for the proposed tuberculosis hospital, for which the members of the Windsor Chapter have been collecting funds.

Welland, Ont.

Deere & Company, of Moline, Ill., U.S., will locate its Canadian branch here. Estimated expenditure, about $1,000,000. Proposed site between the Welland division of the G. T. R. on the east and the canal on the west, about 140 acres. By-laws to provide for macadam road and running of water main to the works will be submitted shortly by the township council.

United Motors, Limited, will build an automobile factory in the township of Crowland. The directors of this concern are Frederick Sager, Detroit; E. A. English, Toronto; W. L. Adams, Niagara Falls; and L. C. Raymond and B. J. McCormick, of Welland. The capitalization is $200,000. The construction of the proposed works will be commenced at an early date.

Winnipeg, Man.

The plans for fire alarm signal station were passed by the council. Noted in last issue.

Dingle Bros., this city, will erect a 4-storey brick warehouse on Stanley street, at a cost of $35,000.

It is reported that Ross & MacFarlane, architects, Montreal, have plans well under way for a large hotel to be erected by the G. T. P. at a cost of over one million dollars. It is stated that tenders will be called upon the completion of the plans, and that excavation work will be proceeded with this fall in order to permit of an early start on the work next spring. The proposed hotel will be located one block west of the new union passenger depot and will be known as the "Fort Garry."

AWARDED.

Brandon, Man.

The contract for the new C. N. R. hotel here was awarded to Thos. Kelly & Sons, Winnipeg.

Brantford, Ont.

J. D. Tindall & Son, Woodstock, Ont., were the successful contractors, at about $20,000, for the 3-storey addition to the works of the Verity Plow Company, Limited, this city. (In our last issue it was erroneously stated that Richards & Pringle had this contract.)

Montreal, Que.

Contract for all the reinforcing steel, including Kahn bars rib metal and cup bars for reinforced concrete elevator and feed mills to be erected at Ottawa for Mr. W. R. Cummings, has been awarded to Mr. G. B .Reynolds, Montreal and district engineer and sales agent for the Trussed Concrete Steel Company of Canada, Limited. Mr. A. E .Baxter, Buffalo, N.Y., designing architect.

Messrs. Jas. Robertson & Company, Limited, are erecting a factory building on Shannon street. Contractors, Robertson Bros., Westmount.

Messrs. H. L. Piper & Company are erecting a three storey factory building on St. Remi street. Contractors, Robertson Bros., Westmount.

Messrs. Blau Gas Company, Limited, Jacobs Building, are ercting a warehouse building on St. Helen street. General contractors, D. G. Loomis & Sons. Architect, D. J. Crighton, Jacob Building.

New Westminster, B.C.

The B. C. Packers' Association of Vancouver are contemplating the erection of a $40,000 addition to their plant here.

Regina, Sask.

Wilson & Wilson, this city, were the successful tenderers at $20,724, for the proposed warehouse of the National Drug & Chemical Co., Montreal. Architects, Storey & Van Egmond.

Winnipeg, Man.

The contract was let to A. J. Bonnett for a brick addition to the rear of the Manor hotel at about $12,000.

Power Plants, Electricity and Telephones

Ingersoll, Ont.

The chairman of the Electric Light and Power Committee was authorized to prepare plans and specifications for new substation on Mill street, for which tenders will be called as soon as possible.

Kamloops, B.C.

A new long distance telephone will shortly be installed between this city and Vernon.

Medicine Hat, Alta.

Bids will be received by D. Milne, mayor, for furnishing two direct connected gas engine driven 125 kw. alternating current units, each engine to be capable of delivering not less than 200 b.h.p. on natural gas of 1,100 b.t.u. per cubic foot. M. A. Maxwell, consulting engineer to city of Medicine Hat.

Matheson, Ont.

Surveying gangs have been sent out to start work on the new electric railway, which will be built from Matheson, on the T. & N. O. Railway, to Porcupine, with a terminus on the shore of Metagami Lake. The men are in charge of Mr. W. C. Chalmers, who is one of the syndicate which will build the line. The work of building the rate will be rushed, as it was stipulated by the Government when permission for construction was given, that the work must commence within ten days and be finished by the end of the year.

Nanaimo, B.C.

The city council has reached an agreement with the Vancouver promoters of the tram line proposition, and the ratepayers will now be asked to approve the scheme. The company propose to put down about twenty miles of track, at a cost of $300,000, more or less, the system to comprise extensions to Ladysmith, South Wellington, Extension, Brechin, Northfield and Wellington, where coal mines are being operated.

Perdue, Sask.

The town council intends to install a telephone system which will connect with the wheat fields rural line now under construction. This is the first step towards the long distance line to Saskatoon.

Port Credit, Ont.

Bids will be received until August 29th by the Hydro-Electric Power Commission, Continental Life Building, Toronto (Adam Beck, chairman), for constructing a transformer station building near Port Credit. Bidders may submit separate bids for structural steel work.

Tillsonburg, Ont.

The Hydro-Electric power by-law was carried.

Vancouver, B.C.

The board of park commissioners will again consider the proposal to build a tram line around Stanley Park. The Electric Railway Construction Company are asking for permission to build the line.

Calgary, Alta.

The city council have adopted the recommendations of the street railway commissioners for extensions of the car lines to the suburbs, and a by-law to raise $454,000, to carry out the scheme will be given its two preliminary readings at the next council meeting, and submitted to the ratepayers at the earliest possible date. Besides many miles of new rails, the estimates include several bridges, twelve new cars and equipment.

AWARDED.

London, Ont.

The contract for the sub-station in the east end of the city was awarded to Hyatt Bros. at $3,550, the lowset bidders. Tenders were also received from J. Garratt, $3,720, and Copp Bros., $4,300.

Ingersoll, Ont.

The following tender was recommended for acceptance: Canadian General Electric Company, for transformer for power station, $4,600; switchboards, providing a marble board instead of slate is supplied $3,500; street regulators, $1,500; street fixtures, $1,180.27; total, $10,780.27. Ross & Holgate, engineers.

Moose Jaw, Sask.

The Canadian Boving Company, Limited, Toronto, manufacturers of high and low lift centrifugal pumps, water wheels and governors, etc., have received an order, through the consulting engineer, Mr. J. B. McRae, for 200 B.h.p. Diesel engines for the Moose Jaw street railway. These engines are manufactured by Mirrlees, Bickerton & Day, Limited, of Stockport, England, and are the first of the kind to be installed in Canada.

Toronto, Ont.

The Board of Control has awarded the following contracts for the electrical substations to be erected at the corner of Ruskin and Edwin avenues: Masonry, Teagle & Son, $26,905; masonry, if artificial stone is used, $25,105; roofing, Duthie & Company, $187; plumbing, Fred. Armstrong & Company, $410; painting, James Casey, $170.

Victoria, B.C.

L. A. Borde, this city, was awarded the contract for the installation of cluster lights here. Amount of contract, $3,181

Weyburn, Sask.

The contract for an extension to the electric light plant at this place has been awarded by the engineer, Mr. G. V. Reed, to Allis-Chalmers-Bullock, Limited, of Winnipeg, at $8,600. Other bids were: Canadian General Electric, Winnipeg, at $9,900; Leonard & Sons, London, Ont., $10,700; Canadian Westinghouse, Winnipeg, $11,300; Goldie & McCullouch Company, Winnipeg, $11,689; Robb Engineering Company, Winnipeg, $11,790.

Miscellaneous

Fort William, Ont.

The council will probably submit a bylaw to raise $5,500 for improvements at the cemetery, these to include $2,500 for residence, $1,800 for a fence and $1,200 for purchase of gravel and general improvements.

Mayor L. Peltier states that the citizens will be given an opportunity to choose between illuminating gas furnished by the city and granting a franchise to a private corporation for a gas plant at a special election, which will be held at an early date.

Medicine Hat, Alta.

The ratepayers have approved by-laws to raise $50,000 for the installation of an electrical plant, $45,000 for waterworks extension and $18,500 for industrial sites.

Montreal, Que.

Recent building permits include Estate Geo. A. Drummond, Sherbrooke street west, alterations to property 182 Peel street, $7,000; A. Deslauriers, 174 Windsor street, a three storey building, 140 St. Antoine street, $5,000; W. N. Aitken, 279 Drummond street, additions to property at 900 St. Catherine street west, $4,000; B. Rrigon, 232 Fairmont avenue, additions to property on Fairmount avenue, $3,500; Geo. W. Reed & Company, Limited, 337 Craig street west, a three storey building on St. Antoine street, $4,000; Montreal Park & Island Railway Company, Montreal Street Railway Building, shops and works at St. Laurent, Que., $200,000; Catholic School Commissioners, Plateau street, a four storey school building on Visitation street, $105,000; H. Vermette, 2697 St. Lawrence Boulevard, three houses containing six dwellings on Clark street, $6,000; Canada Sugar Refining Company, Limited, Montmorency street, a three storey building on St. Patrick street, $18,000; H. L. Piper & Company, Normand street, a three storey factory building on St. Remi street, $18,000; Ferron & Demulon, 117 Desery street, house containing four dwellings on Duquette street, $4,000; James Robertson & Company, Limited, William street, a factory building on Shannon street, $5,500; Jos. Dupuis, 65 Delinelle street, five houses containing fifteen dwellings on Delinelle street ,$12,000; E. F. Gariepy, 2116 St. Lawrence Boulevard, house containing three dwellings on St. Uurbain street, $3,000; Blau Gas Company, Limited, Jacobs Buildings, a warehouse building on St. Helen street, $5,500; Elie Pandin, 1829 Christopher Colomb street, three houses containing nine dwellings on Christopher Colomb street, $7,000.

Toronto, Ont.

At a meeting of the city council las week the new drainage extension scheme for East and West Toronto, the erection of a public lavatory at Roncesvalles avenue and Queen street, and the construction of five groynes for the protection of the lake front at the beaches were passed.

(Continued on page 29)

Tenders and For Sale Department

Department of Railways and Canals

QUEBEC BRIDGE

Tenders for Superstructure

Notice to Contractors

Extension of Time for Receiving Tenders

The time for receiving tenders for the superstructure for the Quebec Bridge advertised to be received up to the 1ST OF SEPTEMBER, 1910, is hereby extended for one month, viz.: up to the first of October, 1910.

By Order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 9th August, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 35

Tenders
for
Electric Lighting

Sealed tenders addressed to the undersigned and marked "Tenders for Electric Lighting" will be received at the office of the City Clerk, Charlottetown, Prince Edward Island, until 12 o'clock noon on SATURDAY, THE 10TH DAY OF SEPTEMBER, 1910, for supplying the City of Charlottetown with Electric Light for Street and Commercial purposes. Tenders to state price and illuminating capacity per lamp for street light, and rate per kilowatt hour for commercial lighting.

The lowest or any tender not necessarily accepted.

Further information can be obtained by applying to the office of the CONTRACT RECORD, 504 Confederation Life Building, Toronto, or to

W. W. CLARKE,
City Clerk.

Charlottetown, P.E.I., July 20th, 1910. 34

TOWN OF WEYBURN

Province of Saskatchewan

Sewerage Work

Sealed tenders will be received by the Secretary-Treasurer of the town of Weyburn, until 8 p.m. on WEDNESDAY, AUGUST 31ST, 1910, for the following works:—

Contract "P"—Sewerage Ejector Station.

Contract "X"—Sewage Disposal Works, including Tanks, Filters and Beds.

Plans, specifications, etc., may be seen at the office of the engineers, Winnipeg, Toronto, and Weyburn.

R. H. SMITH, ESQ., M.D.,
Mayor, Weyburn, Sask.
GEO. ROSS, ESQ.,
Sec.-Treas., Weyburn, Sask.
CHIPMAN & POWER,
34 Engineers, Winnipeg and Toronto.

Town of Dauphin

Province of Manitoba

Water Works and Sewerage Notice to Contractors

Sealed tenders will be received by the Secretary-Treasurer until 8 p.m. on THURSDAY, SEPTEMBER 1ST, 1910, for the following:

Contract "A"—Labor, laying about six miles of water pipes and sewers; sub-divided into two sections.

Contract "D"—Furnishing cast iron water pipe and speical castings.

Contract "E"—Furnishing gate valves for fire hydrants, etc.

Contract "M"—Labor and materials for ten miles of gravity main; sub-divided into three sections.

Contract "R"—Constructing concrete reservoir.

Contract "S"—Furnishing sewer pipes.

Contract "W"—Furnishing wooden stave pipe.

Plans, specifications, etc., may be seen at the Town Hall, Dauphin, or at Engineer's offices, Winnipeg and Toronto.

No tender necessarily accepted.

R. C. SPARLING, Esq.,
Mayor. J. A. CAMPBELL, ESQ.,
J. W. JOHNSTON, Esq., Chairman.
Secretary-Treasurer. CHIPMAN & POWER,
34 Engineers.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Breakwater at Bare Point, Port Arthur, Ont.," will be received at this office until 4.00 p.m., on WEDNESDAY, AUGUST 31ST, 1910, for the construction of a breakwater at Bare Point, in the Harbor of Port Arthur, Electoral District of Thunder Bay and Rainy River, Ont.

Plans, specifications and form of contract can be seen and forms of tender obtained at this Department and at the offices of J. G. Sing, Esq., District Engineer, Confederation Life Building, Toronto, Ont., E. B. Temple, Esq., District Engineer, Port Arthur, Ont., and J. L. Michaud, Esq., District Engineer, Merchants Bank Building, St. James Street, Montreal, Que.

Persons tendering are notified that tenders will not be considered unles made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation and the place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of Public Works for the sum of forty-five thousand ($45,000.00) dollars which will be forfeited if the person tendering declines to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, August 10th, 1910.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 34

City of Regina

Pavement Construction

Sealed tenders, addressed to the undersigned City Clerk and endorsed on envelopes, "Tenders for Pavements," will be received up to 12 o'clock noon, THURSDAY, SEPTEMBER 8TH, 1910, for approximately 33,000 square yards Pavement and approximately 19,000 lineal feet Curb and Gutter, and 3,000 lineal feet of Curb.

Particulars may be had upon application to the City Engineer.

A marked cheque for $6,000 must accompany each tender. The cheques of unsuccessful tenderers will be returned. The lowest or any tender not necessarily accepted.

L. A. THORNTON, A. E. CHIVERS,
City Engineer. City Clerk.
35

City of Peterboro

Province of Ontario

Notice to Contractors

Sealed tenders will be received by the City Clerk until 8 p.m. on THURSDAY, SEPTEMBER 1ST, 1910, for the following works:

Contract "A"—1. Laying 2,000 feet Sanitary Sewer.
2. Laying 4,200 feet Storm Drains.
Contract "G"—Electrically operated Air Compressor and Ejectors.
Contract "P"—Sewage Pumping Station.
Contract "S"—Tile Sewer Pipes 30-inch to 8-inch.

Plans and specifications, etc., may be seen at the City Engineer's office, Peterboro, or at the office of Consulting Engineers, Toronto.

ROBERT HICKS, Esq.,
Board of Works.
T. A. S. HAY, Esq., C.E.,
City Engineer.
R. S. ARMSTRONG, Esq.,
City Clerk.
CHIPMAN & POWER,
Engineers, Toronto.

Tenders for Sewers

Township of York

Sealed tenders, plainly marked on the outside as to contents, will be received by the undersigned up to twelve o'clock noon of MONDAY, AUGUST 29TH, 1910, for the construction of the following works in the Township of York:—

892 feet Vitrified Pipe Sewer on Spadina Road northerly from the city limits.

982 feet Vitrified Pipe Sewer on Spadina Road northerly from the city limits.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, 57 Adelaide street east, Toronto.

The lowest or any tender will not necessarily be accepted.

BARBER & YOUNG,
York Township Engineers.

Toronto, August 17th, 1910. 34

Assignees Sale of Cement Plant

The Assignee of the Grey and Bruce Portland Cement Company of Shallow Lake, Limited, will offer for sale by public auction at the Seldon House, Owen Sound, on the 15TH DAY OF SEPTEMBER, 1910, at 2 o'clock p.m., all the lands, plant, machinery and chattels of the said company. For further particulars apply to A. D. Creasor, Owen Sound, Solicitor for Assignee. 35

The Royal Institute of British Architects, London

Examination for Admission as Associate

An examination for admission as Associate of the Royal Institute of British Architects, London, will be held in Toronto from the 17th to 23rd of November, 1910.

Full particulars and all information regarding this examination can be had by applying to

F. S. BAKER,
34 Traders Bank Building, Toronto.

To Contractors

Sealed tenders, addressed to the undersigned, will be received until TUESDAY NOON, 30TH INST., for the construction of a Sedimentation Tank for Sewage Disposal in the town of Tillsonburg. Plans and specifications may be seen at the office of the undersigned or at the office of Bell & McCubbin, civil engineers, St. Thomas. A marked cheque for $200 payable to the Treasurer of the town of Tillsonburg must accompany each tender as a guarantee of good faith. The council do not bind themselves to accept the lowest nor any tender.

A. E .RAYNES,
Town Clerk.
Tillsonburg, August 19th, 1910. 34

Notice to Contractors

Sealed tenders, addressed to the undersigned, at 212 King street west, Toronto, and endorsed ''Tender for Machine Shop,'' will be received up to 5 p.m. on SEPTEMBER 6TH, 1910, for the various trades in connection with Extension to the Company's Machine Shop at Peterboro.

Envelopes containing tender should have plainly marked on the outside (in addition to the words ''Tender for Machine Shop'') the particular trade covered by the tender.

Plans and specifications may be seen on application to the building department at 212 King street west, Toronto, or in the office of the clerk of works on the job at Peterboro.

The lowest or any tender not necessarily accepted.

CANADIAN GENERAL ELECTRIC COMPANY,
LIMITED . 34

City of Regina

Sidewalk Construction

Sealed tenders, addressed to the undersigned City Clerk and endorsed on envelopes ''Tenders for Sidewalk Construction,'' will be received up to 12 o'clock noon, THURSDAY, SEPTEMBER 8TH, 1910, for approximately 110,000 square feet of Concrete Sidewalk.

Particulars may be had upon application to the City Engineer.

A marked cheque for $1,000 must accompany each tender. The cheques of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

L. A. THORNTON,
City Engineer.
A. E. CHIVERS,
City Clerk.
35

To Contractors

Sealed bids will be received by the undersigned up to noon of AUGUST 27TH for all trades required in the erection of a residence in Victoria avenue, Eglinton.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
34 Traders Bank Building, Toronto.

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board, will be received for the

Enlargement of Humberside Collegiate Institute
(all trades)

Fittings for Science Rooms, Harbord Street Collegiate and Riverdale High School
(Cabinet Work, Plumbing and Electric Wiring)

Fittings for Domestic Science Rooms, Brown, Kent and Kimberley Schools
(Cabinet Work and Plumbing)

until

Friday Noon, August 26th, 1910

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH,
Chairman of Committee.
Toronto, Ont.
W. C. WILKINSON,
Sec.-Treas.
34

Positions Vacant

Advertisements under this heading two cents a word per insertion. Box No. ten cents extra

SALESMAN WANTED—To sell insulating varnishes, either alone or as a side line. Must have good connection with electrical trade. Write Box 129 ''Contract Record,'' Toronto, Ont 35

Miscellaneous

Advertisements under this heading two cents a word per insertion.

CONTRACTOR'S OUTFIT FOR SALE—Six Wheeler, No. 3, concrete line plant, nearly new. Owner going into another line of business. Joseph Patterson, Box 114, St. Marys, Ontario. 35

Miscellaneous

(Continued from page 27)

Toronto, Ont.

The recommendations of the Board of Works for the repaving of Yonge street north of the C. P. R. tracks was referred back for further consideration, as were also the recommendations that by-laws be submitted to the property owners authorizing the issue of debentures for $500,000 for the reclamation of Ashbridge's Bay and for $769,000 for the Bloor street viaduct.

Recent building permits include: Rich and Dankley, pair semi-detached 2-storey brick dwellings, Symington avenue, $4,000; Jas. Soutar, pair semi-detached 2-storey frame dwellings, brick fronts, $4,000; G. A. Graham, 1½-storey brick dwelling, and a garage, Warren road, $6,000; Maple Leaf Milling Company, 2-storey brick warehouse and stable, Dupont and C. P. R., $26,000; W. J. Kernohan, 2-storey brick dwelling, Warren, $12,000; Shackell Edwards & Company, Limited, 1-storey brick warehouse and 2½-storey brick office, Peter street, $13,000; Snowden & Foxton, pair semi-detached 2-storey brick dwellings, near Gerrard, Hiawatha, $5,800; A. Walker, 1-storey brick gospel hall, corner Brunswick and Sussex, $6,800; Bank of Toronto, 2-storey brick apartments and bank, at junction of Roncesvalles, Dundas and Boustead, $9,500; the Newell Company, 4-storey brick warehouse, corner Ontario street and Ontario place, $45,000; R. J. Christie, alterations and addition to dwelling, corner Queen's Park crescent and St. Albans, $55,000; Fred Brown, pair semi-detached 2-storey brick dwelling, Concord, $4,000; Otto Higel Company, 5-storey brick factory, King street west, $50,000; Mrs. Martin Graham, 2-storey and attic brick dwelling, Forest Hill road, $12,000; A. W .Copp, 2-storey brick dwelling on north side Hearndale avenue, $4,000; J. W. Brown, pair semi-detached 2-storey brick dwellings, Concord, $4,000; Butler Bros., pair semi-detached 2½-storey brick dwellings, Clinton street, $5,000; Trusts & Guarantee Company, Limited, alterations to front of bank and offices, King street west, $6,000.

Vancouver, B.C.

Recent Building permits include Pilkington Bros., block on Powel lstreet near Columbia avenue, five storeys, cost $80,000; Mr. A. W. Johnson, four storey block at 195 Alexander street, cost $21,000; School board, manual training school, Napier and Cotton, $3,000; R. W. Gabriel, 2335 Eighth avenue west, $5,000; J. Slemmon, 1426 Fourteenth avenue, $3,500.

Winnipeg, Man.

Recent building permits include: R. J. White dwelling, west side of Craig, between Portage and Wolseley, $2,500; Telegram Printing Company, alterations to printing office, Albert street, southwest corner of McDermot avenue, $7,000; First Church of Christ, Scientists, River avenue, corner Llewellyn, brick and stone, 98 x 98 feet, $70,000; MacLaren Bros. hotel, 7 storeys, Main street, southwest corner Rupert, 66 x 131 feet, reinforced concrete, $165,000; P. Olson, dwelling, Home street, east side, between Portage and Livinia, $2,500; A. T. Wilson, dwelling, north side of McMillan avenue, between Pembina and Nassau streets, $3,000; J. Martino, 3 dwellings, south side Redwood avenue, between Parr and Brown streets, $3,000; J. C. Gage, dwelling, 83 Kingsway, $2,800; W. Hanbury, dwelling, north side of Jessie avenue, between John and Hugo streets, $2,500; J. C. Hicks, apartment block, 2 storeys, McMillan, northwest corner of Lilac, $12,000; J. C. Hicks, 5 dwellings, McMillan, north side, between Watt and railway, worth $12,500; J. Bell, dwelling, Craig, west side, between Portage and Wolseley, $2,500.

AWARDED.

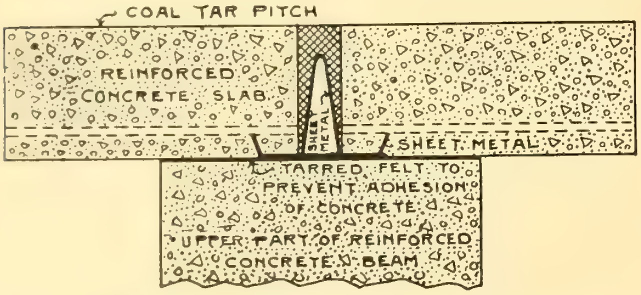
Mersea, Ont.

The contract for dredging and [illegible] ing of drainage work has been awarded by this township to the Detroit Dredging Company at 10 cents per cubic yard. Other bids received were [illegible] Dredging Company, Detroit, [illegible] cents per cubic yard; Chatham Dredging Company, Chatham, Ont., [illegible] cents per cubic yard and [illegible] additional for cutting; Gilmore Bros., Toledo, Ohio, 11 1-4 cents per cubic yard. Engineers, Owen McKay and [illegible], Leamington, Ont.

Expansion Joint in Concrete Roofing

In an article on the construction of walls and roofs for a building in a recent issue of "System," O. M. Becker, industrial engineer, and William J. Lees, construction engineer, of the International Harvester Company, made some interesting observations on the use of concrete in factory roof construction. Recognizing that the qualities desirable in a roof are strength combined with lightness, resistance to heat conductivity, fire and acid resistance and weather tightness, they hold that except possibly for the last named quality these desirable qualities are all to be found in a monolithic concrete construction to a greater extent than in any other one material. By a roof of this description they mean, of course, one that is laid in place by putting the mixture of cement, sand and broken stone, when freshly made, into forms, and allowing it to harden or set in a more or less homogeneous mass. As exponents of the concrete roof they add further that such a roof does not condense moisture on the under surface so much as other materials, with the exception of wood. The objection that is sometimes made to concrete roofs, however, that they are not impermeable to water, can, they claim, be overcome by mixing a good cement waterproofing compound with the top dressing of the concrete, providing also that the roof is designed to permit of expansion and contraction without causing cracks.

A type of expansion joint to allow for expansion changes is shown in the accompanying sketch. This shows that the space between the abutting ends of the concrete slabs contains a fold of sheet metal embedded at each end into the concrete, but allowing for flexibility without giving a direct opening of any kind through the roof at the joint. A filling of coal tar pitch is employed to fill the joint flush with the roof surface and as a flexible material which is also counted to resist the leakage of water. It will be noted that the concrete beam on which the slabs rest was especially covered with tarred felt to prevent adhesion of the concrete slab itself, so that the slabs can have the freedom of lateral movement to accommodate such changes as take place with changes in temperature.


COAL TAR PITCH
REINFORCED CONCRETE SLAB
SHEET METAL
SHEET METAL
TARRED FELT TO PREVENT ADHESION OF CONCRETE
UPPER PART OF REINFORCED CONCRETE BEAM

Expansion Joint in Concrete Roofing.

Another stage in the construction of the new Quebec bridge has been successfully passed by the placing in position of a large caisson, built by Messrs. M. P. & J. T. Davis. The caisson was placed on the north side of the river on August 1st.

During the month of July, 95 building permits were issued in Hamilton, Ont., an increase of 34 over the month of July, 1909. The total value of the permits during the month was $268,500, as compared with $205,475 in July of last year.

A thorough inspection of the trunk sewers of London, Ont., has been made by City Engineer Wright. He finds that the sewers are in excellent condition. Consulting Engineer Graydon, however, reports that a storm sewer is necessary to relieve the present system. It is probable that a by-law will be introduced by several of the aldermen with a view to providing for a storm sewer.

Monday last was the second anniversary of the disastrous fire at Fernie, B.C., and upon that date the property which has been re-erected in the town amounted in value to $4,845,000.

The corner stone of the Provincial University of Saskatchewan was laid on July 29th by Sir Wilfrid Laurier in the presence of a large number of people.

Estimating Amount of Heating Surface for a Building

Wm. J. Baldwin in his work, "Baldwin on Heating," gives the following rule for estimating the amount of heating surface necessary to maintain the heat of the air of enclosed space in buildings to the desired temperature:

The heating surface necessary to warm a room, of course, should be proportional to the cooling surface, and the glass of the windows and the outside walls form the largest factors in cooling.

The glass which forms the windows forms the highest cooling factor in ordinary practice, and it may be taken as 1,000, in which case the following table shows approximately the value of other building materials:

Table of Approximate Power for Transmitting Heat of Various Building Substances Compared with Each Other

Window glass	1,000
Oak and walnut sheathing on walls	66 to 100
White pine and pitch pine	80 to 100
Lath and plaster, walls good	75 to 100
Lath and plaster, common	100 to 150
Common brick (rough)	150
Common brick (hard finish)	200
Common brick (hollow walls, hard finish)	150
Sheet iron	1,100 to 1,200

A square foot of glass and a square yard or ordinary outside wall have about the same cooling value.

It has been found that 1 square foot of heating surface with steam at 1 pound pressure will just about offset the cooling done by 2 square feet of glass, when the outside temperature is 70 degrees. This is so well established now that it need not be questioned.

In the early days of steam heating the writer was acquainted with this fact, and he devised the following rule:

Divide the difference in temperature between that at which the room is to be kept and the coldest outside atmosphere, by the difference between the temperature of the steam pipes and that at which you wish to keep the room, and the product will be the square feet, or fraction thereof of pipe surface to each square foot of glass (or its equivalent in wall surface).

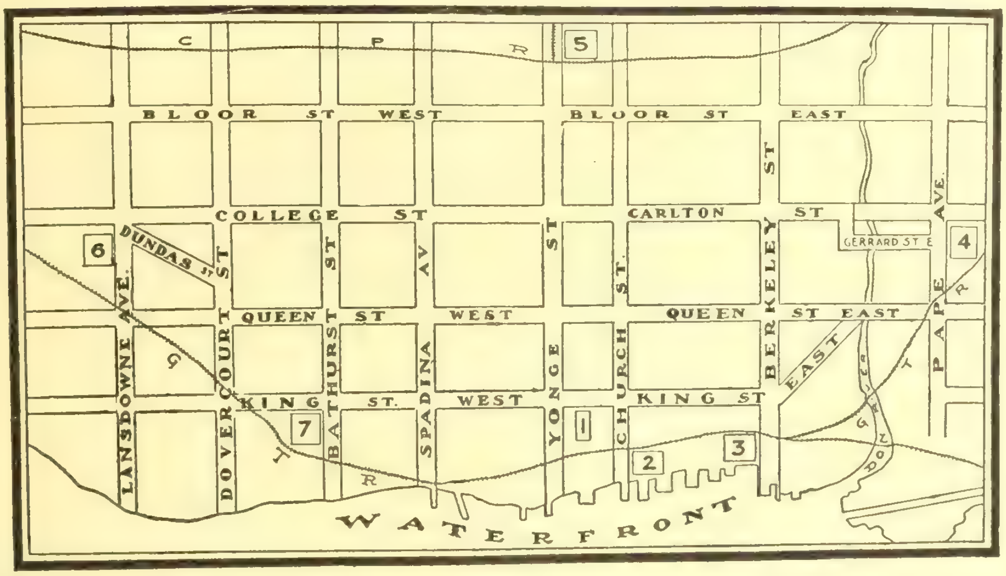
Thus: Temperature of room, 70 degrees; less temperature outside, 0; difference, 70 degrees. Again: Temperature of steam pipe, 212 degrees; less temperature of room, 70 degrees; difference, 142 degrees. Thus: $70 \div 142 = 0.493$, or about one-half a square foot of heating surface to each square foot of glass, or its equivalent.

It must be distinctly understood that the extent of heating surface found in this way offsets only the windows and other cooling surfaces it is figured against, and does not provide for cold air admitted around loose windows, or between the boarding of poorly constructed wooden houses or for ventilation. These latter conditions, when they exist, must be provided for separately.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5

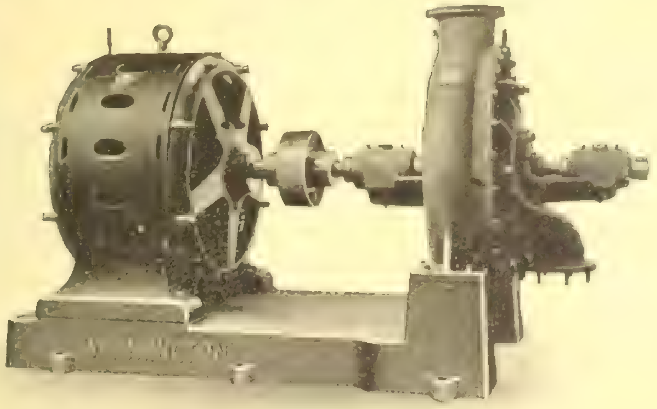


No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, **Toronto**

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

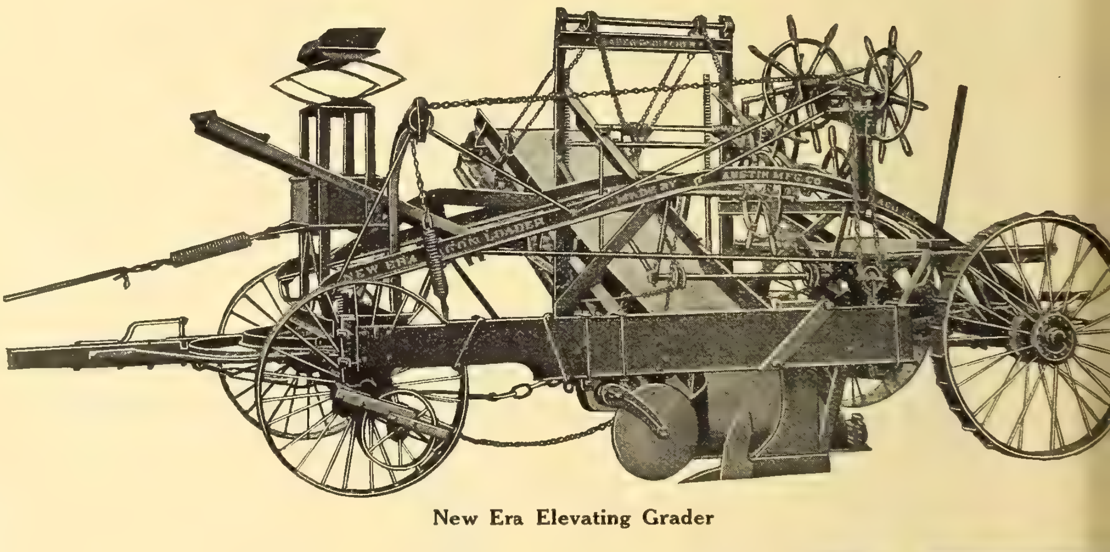
SEND FOR DESCRIPTIVE LITERATURE

WORKS: 512 WILLIAM STREET MONTREAL

**THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.**
Limited

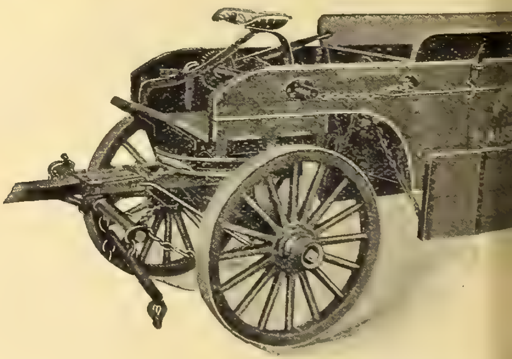
Elevating Graders

for Railroad Grading, Irrigation Work, Municipa
Road Building, Etc.



New Era Elevating Grader

Disc Plow Attachment



Austin Dump Wagon

Head Offices and Warehouses:
Montreal

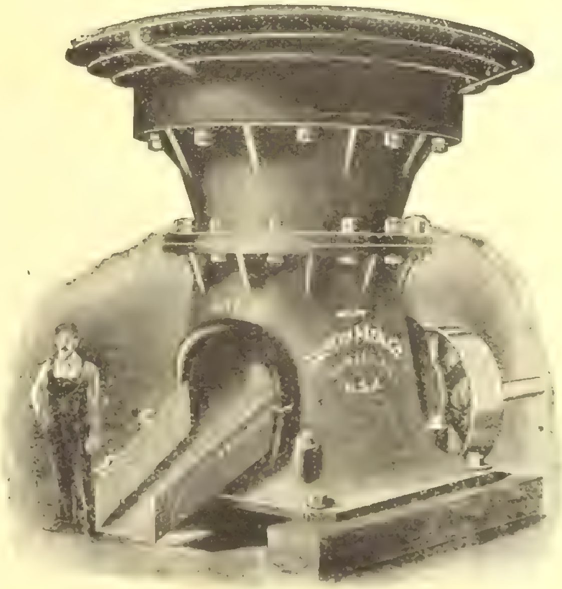
MUSSEN

mplete
Rock
Crushing
Plants

signed and Supplied

- Crushers
- Elevators
- Screens
- Bins
- Hoists
- Derricks
- Rock Drills
- Drill Steel
- Cars
- Locomotives

WRITE FOR CATALOGUES



Austin Gyratory Crusher

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's Liquid Rubber

A black elastic coating, especially intended for damp-proofing basements and walls. Applied over brick or plastered surfaces. Durable and elastic under varying conditions of temperature.

Covers 150 square feet to gallon and upwards, according to condition of surface.

Specifications.

Apply two good, full coats to exterior surface of basement walls, either directly upon the brick or over a plaster veneer. Allow two or three days between coats.

For inside surfaces of exposed walls apply one or two coats (preferably two) directly to the surface. Apply the plaster over the Liquid Rubber—the application of the plaster closely following the application of the Liquid Rubber, preferably while the Liquid Rubber is still tacky and carrying adhesive bonding properties.

Great care should be taken to see that every pore of the wall surfaces is completely coated and closed with the Liquid Rubber before applying the plaster.

Upon interior basement walls apply one or two coats of our White Liquid Cement to complete the damp-proofing and intensify the radiation of light, producing a beautiful sanitary basement.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio

Distributed in Canada by

Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

THE NORTHERN ELECTRIC AND MFG. CO. LIMITED
FIRE-ALARMS TELEPHONES SUPPLIES

Inter-phones

No. 2016—Type-Metal Inter-phone for desk use

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 413 with full particulars.

THE Northern Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto August 24, 1910 No. 34

The Strike at Winnipeg

The action of the Winnipeg Builders' Exchange in locking out nearly eight hundred masons and bricklayers owing to the boycotting by the workmen of one of the leading western firms is drastic only in the sense of its being efficacious. If Canadian contractors are to have any say at all in the conduct of their business and in the direction of their contracts they must show a little more of the spirit of the Winnipeg Builders' Exchange. This association is to be congratulated upon the example it has set and the firm stand it has taken.

For some time the balance of power has been inclining to the trades unions. They have set the number of hours a man may work in a day. They have stipulated what price a laborer is worth and in some cases they have even controlled his output. They have laid down this condition and that, and now the only thing they desire is to compel contracting firms to employ only union men, at their terms.

It is all very well to keep peace for the sake of trade prosperity, but there is a limit to every form of endurance and there always comes a time when pacific measures are construed by the ignorant into admissions of weakness. The Montreal firm which claimed the privilege of open shop was well within its rights and it would be an enduring disgrace to contracting interests to allow any blackmailing of this sort by the unions.

This Winnipeg affair, we venture to think, will be a nail in the coffin of the present constitution of trades unionism. The violation of privileges, the abuse of power, are things that were never tolerated for any length of time in any stage of British history. If they *had been*, Canada would long since have lost her identity,—and if they *are*, the glorious destiny foretold by far-seeing politicians and others will be long in its fulfilment. So long as the union works only for the equitable rights of the trade it represents it is a power for good of inestimable value, particularly in a building country like Canada; but let it exceed its proper functions and nothing can have a more baneful influence, a more demoralizing effect, upon the working community.

The Decreasing Efficiency of Labor

A Chicago contemporary contends that the costs of work at the present time are from *25 to 50 per cent. higher* than they were *five years ago*. On the face of it this is startling, and possibly an exaggeration, but certain it is that the cost of construction work has increased materially in the period named—in Canada equally as much as in the United States,—and it is disturbing, under these conditions, to reflect upon the decline in the efficiency of labor. Both skilled and unskilled labor are included. This decrease in efficiency, taken in conjunction with the increased wages and higher prices of recent years, show up very unfavorably against the conditions under which construction was carried out but a few years back.

Various causes are adduced for the less efficient workmen. The reason assigned by some is that work is much more plentiful than formerly; by others that those in charge are less efficient, and by a few that it is traceable to the labor unions. Those who have studied the question at all seriously remain unconvinced after hearing arguments based upon the above contentions. The cause has not yet been wholly determined, neither has a satisfactory solution been offered. The matter is a vital one to all interested in construction, but most of all to contractors.

The contractor must brace himself to meet the extra burden by more scientific management and by making himself familiar with the latest labor saving machinery and tools, which, of course, are designed to take the place of men. The former must be the primary consideration, however, for efficient men will always be needed in construction work. The progressive contractor, he who is able to read the signs of the times and who can adapt himself to the changed conditions of the present day will meet the situation by improved methods of management. The regular daily or weekly wage does not bring out the best that is in a man and the contractor who feels this and who offers an incentive greater than the regular daily wage will doubtless obtain good results from his men. There is a growing tendency on the part of the laborer of to-day to consider that he is worthy of something more than his hire; that he should be afforded the chance to earn extra remuneration by ability and hard work. This tendency in itself is not alarming. The way to meet it is to modify the time honored wage system and introduce a system of payment whereby a man will be rewarded more nearly in proportion to his merits.

County Engineer and Highway Superintendent J. Y. McClintock, of Monroe County, New York, according to the Empire State Motorist, has invented a new method of highway surfacing which promises to go a long way toward meeting the demands of the day for automobiles as well as horse travel. Because of its comparative cheapness it is not unlikely that the new method will find great favor in the rural districts and villages where the traffic is not excessive.

The new method is to make the wearing surface of two-inch cubes, which can be made of various materials to meet the requirement of the traffic of the particular road. One of the good points of the method is the comparative ease with which the roadway can be repaired and maintained. The cube road is as near dustless as can be found without frequent oiling or sprinkling. The dust that does wear from the cubes fills into the cracks, making an excellent binder.

The first piece of road laid by Mr. McClintock for the purpose of testing the practical value of the cube road was constructed last year on the Ridge road in the town of Greece. The New York State Highway Commission appropriated $2,500 for the experiment of 1,800 feet of roadway which was constructed. Of this 1,600 feet was laid with 2-inch cubes made of Portland cement concrete mixed with the soft local gravel taken from beside the road. The cubes were made by the roadside by a machine which was capable of moulding 68 cubes in one operation. With this machine five men turned out 27,000 cubes a day. The cubes, after making were set aside for 24 hours on racks and then dumped into a pile and allowed to harden for three months. They were then laid by hand and pressed into the sand cushion of the old macadam road by a 12-ton steam roller.

Civic Improvement at Vancouver

Eastern critics are spending a mint of money to correct the mistakes made by the first city builders. The city of Chicago alone, will spend a billion dollars to do the work that ought to have been done in the days of its infancy. New York, Cleveland, Philadelphia, Pittsburg, Boston, are all engaged in the work of self improvement. But the cost will be prodigious, and many years will be needed to do the work. Knowing this, the manager of the Vancouver Tourist Association, Mr. E. S. Rowe, has proposed that the city of Vancouver undertake the work at once.

In his address delivered to the committee, Manager Rowe mentioned the value of civic beauty. In outlining his plan he said in part:

"Other things being equal, the most beautiful city is that which is so panned as to make the best use of the opportunities for parks, open spaces, civic centres, wide and imposing streets and driveways, boulevards, etc., that the location and contour of its site affords. The conditions affecting Vancouver open to it the opportunity of becoming one of the most beautiful cities in the world. Its site lends itself to artistic treatment. Its surroundings furnish a setting worthy of the best product of the ablest civic designers. Its future prosperity is so certain, its place among the greatest centres of the world is so fully assured as to justify the most elaborate civic plan that could be designed. That is to say, there is no good reason why Vancouver should be anything but the best that the physical conditions affecting it make possible.

"These results will not be obtained without action on the part of private citizens, and this association should undertake to keep the question continuously before the public, in a positive way, by devising and promoting schemes for the carrying out of the purposes in question."

As to the means to the end, Mr. Rowe suggested:

The fixing of a building line on residential streets; the imposing of restrictions as to sections, etc., in which buildings of certain classes may be erected, including a stricter regulation as to the place of bill boards and advertising signs; the utilization of open spaces for cultivation of flowers, shrubs, etc.; the beautifying of school grounds; the securing of property for parks and recreation grounds in the various parts of the city; the laying down of boulevards, etc.; stimulating the growing of flowers.

The chief undertaking, however, will be to work for the securing of the services of an expert to report upon a comprehensive scheme that will include provision for all the civic works, underground as well as on the surface, necessary to the city in the future. All undertakings could then be made to constitute features of one all-embracing design, parts of one harmonious whole. This will remove the possibility of having to tear up work done in one year, in doing that of a few years later. Such a plan, too, would be of great value in connection with the designing and locating of public buildings, civic centres, and so on.

A Comparison of Labor Costs

The comparison afforded by the following schedules of wages as furnished by the Labor Gazette may prove of interest. The following table relates to the construction of a public building at Vernon, B.C., by W. A. Cryderman, of Vernon, under date of May 12th, 1910; amount of contract, $29,950:

Class of Labor	Rate of wages not less than
Stonecutters	$5.00 per day of 9 hours.
Bricklayers	5.00 per day of 9 hours.
Masons	5.00 per day of 9 hours.
Carpenters	3.60 per day of 9 hours.
Joiners	3.60 per day of 9 hours.
Stairbuilders	3.60 per day of 9 hours.
Plasterers	5.00 per day of 9 hours.
Lathers	2.50 per thousand.
Painters and glaziers	3.60 per day of 9 hours.
Plumbers and steamfitters	4.00 per day of 9 hours.
Sheet metal workers	4.00 per day of 9 hours.
Electrical workers	3.50 per day of 9 hours.
Builders' laborers	3.00 per day of 9 hours.
Ordinary laborers	2.50 per day of 10 hours.
Driver, with one horse and cart	4.00 per day of 10 hours.
Driver, with 2 horses and wagon	6.00 per day of 10 hours.

The next schedule relates to the restoration of the Military Stores Building at Ottawa, under date May 17th, 1910; contractors, W. H. McGillivray and J. O'Toole amount of contract, $27,393:

Class of Labor	Rate of wages not less than
Stonecutters	$ .44 per hr., 8 hrs. per day.
Bricklayers	.50 per hr., 9 hrs. per day.
Masons	.50 per hr., 9 hrs. per day.
Carpenters	.25 per hr., 9 hrs. per day.
Joiners	.30 per hr., 9 hrs. per day.
Stairbuilders	.30 per hr., 9 hrs. per day.
Plasterers	.40 per hr., 9 hrs. per day.
Lathers	1.75 per thousand.
Painters and glaziers	27½ p. hr., 9 hrs. per day.
Plumbers and steamfitters	.36 per hr., 9 hrs. per day.
Tinsmiths	.30 per hr., 9 hrs. per day.
Metal roofers	.30 per hr. 9 hrs. per day.
Electrical workers	.25 per hr., 9 hrs. per day.
Builders' laborers	.25 per hr., 9 hrs. per day.
Ordinary laborers	.18 per hr., 9 hrs. per day.
Driver, 1 horse and cart	.25 per hr., 10 hrs. per day.
Driver, 2 horses and wagon	.45 per hr., 10 hrs. per day.

The good roads work in the county of Carleton is progressing very satisfactorily in all the townships. Mr Farley, the engineer, states that he is well satisfied with what has been done. Already about $10,000 has been spent and the work will be hurried more vigorously after the crops are in. It is expected that $20,000 will be spent before the fall.

Mr. A. W. Fawkes, who has been in Peterborough for some time as resident engineer in connection with the new waterworks dam and power house, left recently for Minneapolis, having obtained a responsible position as engineer of construction on a railway in Minnesota.

Unconsidered Elements in Figuring Cost

The Fundamental Rules for all Successful Estimating—Important Factors often Omitted which should be Figured — Estimated Unit Cost

A schedule of those factors which are usually overlooked by most contractors but which do have an astonishing effect on the total cost of a job are presented in this paper. A consideration of these—although they apply especially to very large work—should prove interesting to all.

Before taking these up, however, we desire to state the six general rules on which all successful estimating must be based :

1. Make all estimates in the fullest possible detail.
2. Get together and classify all the available data before commencing to figure.
3. Use a carefully prepared standard schedule of items for the classification.
4. Go over the ground with great care—visiting the site of the work, if possible—to guard against the omission of items not provided for in the standard schedule.
5. Put down all the unit-quantities first; then all the unit-prices; and finally, make the arithmetical computations in such manner that you will not know even approximately the final results until the figures have been thoroughly gone over and tabulated.
6. Check over the final results by every available means, such as contract prices on similar work, which are unsatisfactory as preliminary data, but may be very useful as a check.

The reasons for these rules are as follows:

1. At first sight it would seem that it requires more labor and time on the part of the estimator to make estimates in elaborate detail than to make them in general. This, however, is not the case according to experience, since a much larger part of the detailed estimate can be done mechanically than when many of the items are lumped, and because the more elaborate the detail, the more confidence a man has in his own figures, and the faster he is able to work. When an estimate is made in careful detail, gaps in the available informaton become apparent; and in this way it is easy for an estimator to know what information he lacks, and where the dangerous parts of his estimate are likely to be. Then, again, an estimate made in detail is much more easily checked by the subordinate or by the estimator's superior officers; and, when filed for reference, such an estimate is a document of great utility in future work. When the field costs are properly prepared, they can be used to check up the estimate for the work, in a way that is not possible if the estimate is not made in full detail.

2. It is a psychological fact—one based on the natural tendencies of the human mind—that if an estimate is made as the figures come in, it is impossible to obtain as good a grasp of the general problem as when the data are first collated, and the estimate then prepared on the data. While the estimates should be made in full detail, this does not mean that they should be made for different items of the work independently, since all parts of a piece of construction work are to a large extent dependent upon one another, and thus, if the estimated cost of one item is set down before the other items are known, their interdependence or mutual relations will not be appreciated and will not be allowed for in the estimate.

3. Rolling off a log is a difficult and elaborate feat compared with forgetting items in an estimate; and it has been found, from wide experience, that the best way to avoid omitting items is to start with a standard schedule. To write a zero after an item that is not going to come into the estimate, takes practically no time; and the use of such a schedule in all cases is excellent insurance against blunders. A good plan is to have such schedules in stock, printed on sheets of coarse-ruled paper.

4. It is a sad fact that a great many estimates are made without the estimator ever seeing the work. This is utterly wrong; and it should be an invariable rule that the estimator must go over the ground, and go over it thoroughly; else it will be impossible for him to use the essential quality of judgment. Moreover, there is nothing like a physical view of the field for enabling a man to grasp all the details of the work. For this purpose, plans are of great assistance in the detailed analysis; but they are no substitute for a good look at the ground.

5. An estimate, to be accurate, should be absolutely unbiased; and where a question of judgment is involved, it is essential that the estimator make his figures without regard to what the grand total will be.

6. After the grand total has been computed, it should be checked; and the checks may throw some light upon erroneous items, which can then be corrected. The estimator's judgment will be a great deal more accurate if he works the problem out in detail first, than if he tries—perhaps subconsciously, or without fully realizing the fact—to work to a desired or hoped-for result.

The practice of taking somebody else's contract price as a base for figuring, is very deceptive if you do not know what specifications he had, how he intended to do his work, what layout he anticipted, and what his financial arrangements were. All of these items are of the utmost importance in figuring the economics, or the financial features, of any particulyar piece of work. Conditions vary in places short distances apart; rates of wages vary in different parts of the country; specifications, and the interpretations of identical specifications by different architects vary greatly; the bid prices are frequently too low or much too high; the bid prices may be purposely "unbalanced"—that is, made abnormally high on certain items, and abnormally low on others, but always so as to offset one another and "even up" in the grand total; a unit-price for a large job is usually too low for a small job, on account of the falling percentages, or relatively lower rates, of overhead charges and superintendence on the larger jobs; a contractor well equipped with plant can usually bid lower than contractors not so equipped

Factors to be Considered

Amount of Work—The estimator will generally have trouble when it comes to the amount of work to be done, this being roughly approximated, with the right to increase or decrease it later. (This does not apply usually to contracts for building construction.) A good method is to write down the maximum and minimum amounts that are likely to be involved. Clauses in the contract which enable the owner to change the contractor's quantities without changing unit prices, should add something to the contractor's estimate, for the reason that there is one best plant, one best arrangement, one best organization, and one best outfit for every particular work. It has been shown that many of the conditions which affect the economy of the work are themselves affected by the quantities of work to be done; and any change on the part of the owner's mind affecting the quantity of work to be done, should—but rarely does—tend to increase or decrease the contractor's unit-price. In order to guard against such a contingency, the contractor should add something to his price by way of insurance. After an estimate has been made, it is a practice of many contractors to "unbalance" their bids. A great danger from this is that the work may have to be completed with quantities different from what were originally figured.

General Layout—The general layout of the work can be determined only by a personal inspection of the ground; and on this the estimator should make copious notes, having special reference to the distance of railroad connections, the distance of the railroad connection from shipping points of materials and supplies, the character of the country, the kind of water, and as many of the local conditions as can be reasonably and quickly noted.

Bonus or Discounts—This item depends largely upon the particular business followed. If the contractor is figuring to earn a bonus on the contract price by getting through before the time limit, such being provided in the contract, it should appear in the estimate; and, as offsetting this, what he can lose by delay should also appear in the estimate. Not many months ago, one of the largest cities in the United States paid for a considerable amount of work in bonds at par, which several contractors, needing the money, sold at a discount of not far from 3 or 4 per cent., as it was not convenient for the city to raise the money on short notice. It is safe to say that this had not been figured on in their estimates.

Charity or Accidents—This is an item about which it is practically impossible to give advice in advance. The first part of it covers a good many sins and other things in contract work; while accidents are generally provided against, as far as possible, by insurance. Where the insurance companies refuse to insure, the contractor has got to provide against this item in the estimate somehow; and it is well to estimate the rate that the insurance companies would be likely to insure for if their rules did not prevent them from doing so, and to multiply this rate by about two.

A contractor is supposed to assume certain risks; but, as pointed out by Colonel Raban, of the Institution of Civil Engineers of Great Britain, it is another question whether all of the risks should be put upon the contractor. Risks from weather, the problems of handling men, and the general vagaries that go with all construction work, are probably the contractor's risk; but, when held up by strikes, or by eventualities that are peculiar to his line of business, it seems unreasonable to shift these risks to the contractor's shoulders, and thus needlessly raise his estimate.

Depreciation and Repairs—No other part of the estimator's task will call for the exercise of more careful judgment than the determination of the percentages of depreciation and the amount for repairs.

Fire Insurance—The rates vary widely with different localities and with different kinds of buildings or equipment insured; and where a general approximation is not sufficiently definite, the estimator will have to go to the nearest fire insurance agent, who, with the idea of getting business, will be so keen to furnish him with information as to make it a pleasure to ask for it.

Burglary Insurance—This, like fire insurance, will depend upon local conditions and the state of mind of the insurance companies. Where it is not thought advisable to purchase burglary insurance, the estimator should nevertheless realize that theft is possible if not likely, and it is wise to allow about 2½ per cent. of the value of the constant stock of small tools and supplies on the work for this item.

Freight, Express, etc.—This must depend upon the class of material handled, the distance to be hauled along the railroad, and the amount of competition between roads. It will be more in sparsely settled country than where there is much competition.

Accident Insurance—Insurance against accident to both employees and outsiders, on work of normal risk, will cost about as follows:

Masonry	3	per cent. of the pay-roll.
Ornamental iron work	3	per cent. of the pay-roll.
Excavating (no blasting)	3	per cent. of the pay-roll.
Carpentry	2.25	per cent. of the pay-roll.
Private dwellings	1.85	per cent. of the pay-roll.
Plumbing	1.25	per cent. of the pay-roll.
Painting	1.25	per cent. of the pay-roll.

When the risk is great, these items may run as high as 8 or 10 per cent. Insurance on building wrecking runs as high as 13 per cent.

Bond—From a well known indemnity company, in 1909, when a bond is in favor of New York City and is for 5 per cent. or more of the contract price, ½ of 1 per cent. of the bond is charged. When it is less than 50 per cent., ¼ of 1 per cent. is charged. The minimum charge is $10. All other bonds cost ½ of 1 per cent. of contract price. Bonds on contracts for furnishing supplies only (no labor) cost ¼ of 1 per cent. of contract price.

Estimated Unit Cost

Hourly Direct Labor—From his general experience and what information he can gather from published data, the estimator is in a position to determine with fair accuracy between what limits he can reasonably expect to come on the item of direct labor, which is the fundamental labor charge and which ought to be nearly proportional to the actual amount of work accomplished.

Weekly and Monthly Labor—This can be selected as a percentage of the item above mentioned, and depends very largely upon the local conditions, number of men employed, etc. Where there is a large amount of plant, such as steam shovels, hoists, drills, etc., it may run as high as 15 per cent. maximum. For average work it is likely to be about two-thirds of this.

Superintendence—This is likely to vary from 10 per cent. to 20 per cent. of the direct labor pay-roll. It will be more on small work, and less on large work. On large work, it is generally too small for true economy.

Materials—The amount of these to allow for can be figured from the plans of the finished work. A percentage, generally not less than 3, should be allowed for loss in handling, shortage in shipment, etc. There should also be an allowance for miscellaneous supplies.

Miscellaneous—It is a practice of many estimators to add from 5 per cent. to 10 per cent. to their estimate for miscellaneous and contingencies. The more the detail of the estimate, the less the necessity for a large amount for this item. Miscellaneous items can cover possible inefficiency of laborers, strikes, raise in rates of wages, or unforeseen contingencies. From 5 per cent. to 20 per cent. of estimated labor cost is a fair allowance. It is an item used to insure against oversight or ignorance in making up an estimate. On materials the prices of which can be obtained before putting in a bid, there is no necessity for this.

Field Sub-contracts—Sub-letting often results in low cost of work, because a sub-contractor who gives all his attention to the work can frequently get a small job done to better advantage than a large contractor who has not so much time to devote to details. One contractor can generally manage several sub-contractors on a job much more satisfactorily than several independent contractors can be managed by the architect.

It is then necessary to decide upon the percentage to be added for overhead charges. These can vary from as low as 4 per cent. to as high as 22 per cent., depending upon the kind of organization and the distribution of expenses. It will be noted that a number of the items mentioned are overhead, and it is well to itemize as many of these as possible in order to make the percentage to be added include as little as possible, and thus be nearer the truth.

Profit—The estimator can figure his grand total of cost, to which should be added a percentage for profit. On small work where the risk is large, this should be high; and on large work where the risk is small, it may be as low as 10 per cent. when there is competition. The profit should not only take care of the risks of the business that cannot be or are generally not included in the above items; but it should also take care of the compensation to the stockholders, or to the contractor himself for his time and skill and risk in organizing the business and keeping it going. Thus, on certain work, 25 per cent. or 30 per cent. is not an excessive profit.

The second dam of the Canadian Government's Ottawa river storage system has been finished by the contractors and turned over to the engineers. This dam is situated at one end of one of the outlets of Lake Kipewa, lying about nine miles east of the Ottawa and discharging into it at a point about 300 miles up stream from the capital. The entire storage scheme calls for 45 dams located throughout an area of 45,000 square miles, controlling all the important lake expansions and feeders of the upper reaches of the Ottawa river and regulating the flow of the Ottawa for 600 miles from its course.

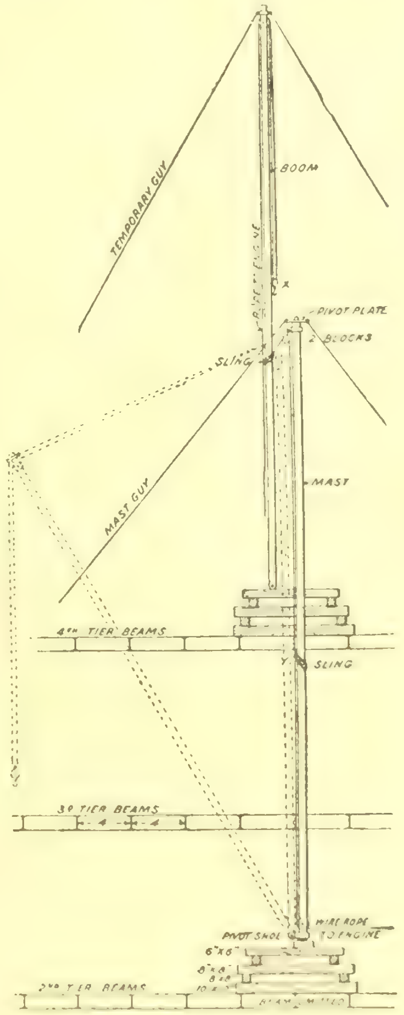
Raising Large Derricks in Erecting Tall Buildings

One of the most important operations which must be performed in the construction of edifices of great height, says a writer in the "Building Age," is the raising of large boom derricks from one tier of beams and girders to that above. It is almost needless to state that the work requires the greatest care and circumspection while in progress, and must be executed by experienced workmen who are technically termed "riggers" and who, like sailors, are thoroughly acquainted with all the ropes, knots, tackle, hooks, splices, blocks, turnbuckles, etc., essential to the execution of work of this class.

Regarding the first raising of the derrick mast to its perpendicular position the operation is so simple that it is only necessary to state that it is drawn to this position by wire guy ropes, of which there are never less than four and frequently more. The greatest care must be exercised as the pole rises, especially as it approaches the perpendicular. The blocks and tackle for hoisting can be adjusted by means of the boatswain's chair. In the sketch, the derrick is shown set on one tier of girders, the boom having been raised to the second floor level above.

After the boom of the derrick has been elevated to the next floor level where it is to be placed, which is done by disconnecting the boom from the pivot shoe on the mast, it is equipped with temporary guy ropes and lifted with a stout rope sling set about half the distance of its height, use being made of the mast-hoisting tackle. When up to the desired level it is set on and lashed to a solid timber platform placed across the steel beams plumb to an upright position and the temporary guy ropes made fast, thus forming an excellent yet simple expedient for raising the mast to the upper tier, which, as the illustration shows, is done in a somewhat similar manner; that is, by rigging a fall on the boom and a sling on the mast. Now, when the block hook at X and the sling at Y are attached the wire rope fall may be carried to the engine drum and the mast raised to its next position.

The floor beams carrying heavy derricks and loads of this description must always be temporarily shored directly under the blocking from the basement floor up to prevent jar, strain, and vibration.



Raising Large Derricks

It is usual to raise derricks of this kind through two tiers at least, and the mast being, say, 60 feet in height and the boom 2 feet shorter, this can readily be done. There must be a man at each guy rope when raising and the utmost accuracy and care be exercised to screw up all turnbuckles, set all blocking, etc., and all falls and chains must be tested as to their bearing capacity. Finally, the work as it proceeds should be superintended by a tried and experienced foreman, so as to avoid accident of any kind.

The last payroll passed by the Vancouver Board of Works covered the wages of 1,618 employees and called for $13,200. This constitutes a record.

Satisfactory Methods of Water Painting

Pointers from the Experience of a Master Painter — Some Helpful Results Items of Interest for the General Building Contractor

By E. L. Linington, Toronto

First, to my mind, comes the vexed question of the hot and cold water paints, and this is a question largely of individual likes and dislikes, for it is well known that both have their merits, and I would not like to throw cold water on the hot water man and vice versa. But I have tried out both of them, and personally I will not have the hot water article any more—not because it is in any way inferior to the cold water paint, but because of the lost time in making up the same, for in my experience every pail of tinting color costs me at least one half hour's time securing the hot water, and often more, then, if it be in the hot weather, we have to wait for it to chill before going on with the work, so I havt concluded to use the cold water article altogether.

After settling the question of what brand of paint to use the next important step, I think, is to be sure of our tinting colors, and I do not wish to insult the intelligence of this audience by advising on this question, but it is a fact that largely dry colors are used for this purpose, and, gentlemen, from my own experience I cannot make a solid job unless I use colors ground in water. I find that where considerable dry colors are used, there is a tendency to shade which cannot be avoided, no matter how well the paint may be strained or brushed out.

On the question of preparing I think enough has been said at our former conventions. Some people prefer a coating of gloss oil and others a flat lead coating, but where practical I like to line the ceilings, coves or walls with a good heavy lining paper, then give same a coat of flat paint, and in my mind you have an ideal surface to tint on, and one that will readily wash off when the room is being done over again. If expense is not the most prominent feature I would ust a prepared cotton in place of the lining paper, and treat with paint before tinting, then you have a ground that will not readily crack through and one that can be painted over at any time if necessary.

Pointers from Practical Experience

At the present time we have a large number of water paints on the market, with which one can do the most beautiful work—tints that will stipple and blend together, and I find that the limit for beautiful work depends entirely on the ability of the decorator.

The paints are largely in dry powders, with one or two exceptions, where the pigment is ground in paste form and is soluble in water; of the latter there have been some adverse criticisms, but I find, to a great extent the faults are with the men who do the work, especially the preparing and mixing. If one will follow carefully the specifications laid down by the makers they will have but little trouble. There is also one great benefit in these paste water paints, namely, their washing properties, for I find that after about one month's time has elapsed you can clean the surface with a damp cloth, provided some care is taken. Again, it is not necessary to remove old coatings to coat over again—in fact you cannot remove them, and if necessary at any time you can coat with oil paints without any fear of chipping or cracking—in fact, one of these pigments makes, to my mind, a perfect ground for either painting or enamelling.

Now, at this point, I would like to state a few points that have lately come under my notice. We had a contract to paint a large manufacturing building after a fire, and the entire building was blistered and smoked. We thoroughly washed all the work with hot water and Savogran, and then coated with oil paints in the usual way, the paint apparently drying. After completing three flats in this way we found that in some places on the fourth floor the paint would not dry. We tried several things, shellac, pure japan and turps among others, but everything refused to dry. I then coated with Duresco water paint and it dried perfectly. We then finished with oil paints and made a good job. About two weeks after this I was very much surprised to hear that a lot of our work on the upper floors was wet, and on inspecting same found that such was the case. It evidently had never dried properly, and it came back again as wet as when first put on. Now we did not wish to wash it off, and we could get nothing in the paint line to dry it. As a chance I tried a coat of Duresco right on to the wet paint, and to my surprise it dried out perfectly, the paint being a French grey. I used a pure white water paint, and the result was a light grey, and in two hours was as hard as a rock.

On another job where we had a large office to do the walls were red brick, and they wished them finished in enamels. The work was not dry enough for oil paints, so we gave them two coats of cold water paint, using this time Opolite. To every pail of paint we added one-half pint of raw linseed oil, but in at the first mixing. We then coated with a pale hard drying varnish, to which was added some zinc white, and we turned out a very creditable job.

On another job the ceilings were finished in staff plaster with considerable ornamentation. The flats were to be cottoned and painted, and usually it takes a number of coats to bring the work up to a level surface. In this case I had one coat of Duresco put directly on the cotton, and then I finished with two coats of color and wiped, and it was one of the best jobs I ever turned out.

It seems against the rules to put a water paint on goods like cotton, which is held in place with paste, but it did not lift a joint and made a better job than five coats of oil or flat paints would have made.

I have also found that a good water paint is much better than an oil paint for a verandah ceiling where the sheeting is next to the roof and subjected to the sun's direct heat. I have found it nearly impossible to stop the paint from being discolored where oil paints were used, but on several jobs that we have done with water paints there has been no staining, and the work has been remarkably well.

For a quick rush job it will make a splendid priming, and not raise the grain, leaving a good surface for painting, but you must not make the mistake of forgetting the shellac bottle or you will have a poor looking job on your hands.

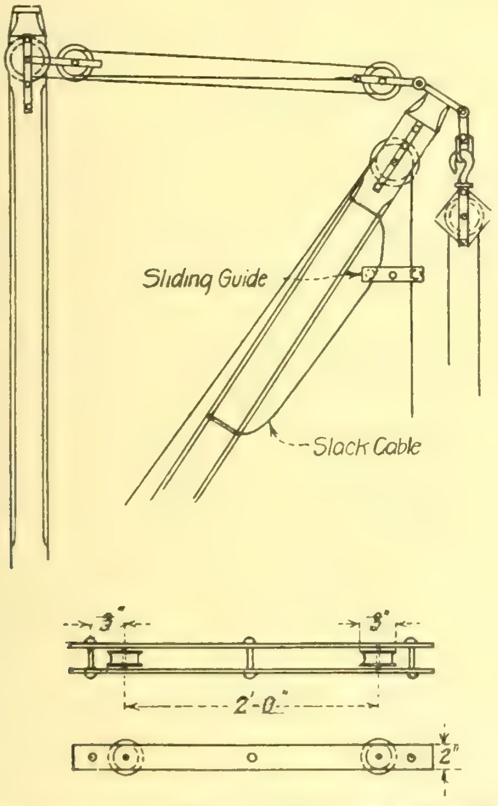
---

* Extract from paper read at the 7th annual convention of the Master House Painters & Decorators' Association of Canada, Ottawa, July 26-28 1910.

Methods of Keeping Fall Block on a Derrick from Twisting and Swinging

A simple method of keeping the fall block on a derrick from twisting is used on the New York Barge Canal at Buffalo.

As shown by the accompanying sketch a cable is fastened along the boom with about 2 feet of slack. One end of the cable is fastened as close as possible to the sheave near the end of the boom, and the other end of the cable is fastened about 10 or 15 feet from the base of the boom. Two flat pieces of iron about ¼x2 inches x 2 feet are fastened together with two sheaves between them, one sheave at each end, as shown in the sketch. This is then put on the derrick with the slack cable and the fall line passing between the sheaves, as shown in the operation of the derrick. This guide slides up and down on the cables. When the boom is being lowered the guide slides up. Besides preventing the twisting of the blocks it also serves, to some extent, in preventing the load from swinging.



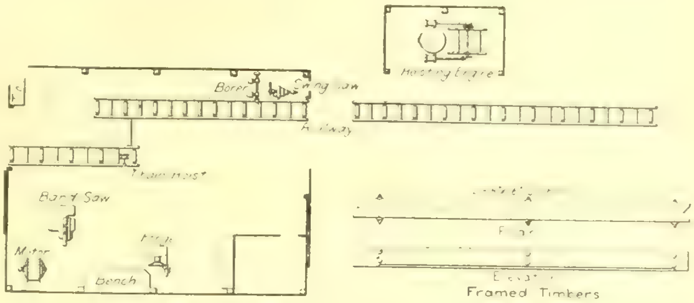
Derrick Arranged to Prevent Twisting of Fall Block

Timber Framing Plant for Mill Construction

The construction of a large mill of the slow-burning type, at Holyoke, Mass., necessitated the framing of a large amount of heavy timber, and a specially designed plant was installed for this work, says the "Engineering Record." The floor beams used in the construction of this mill were two 8 x 16-inch southern pine timbers bolted together. The work of framing consisted of squaring the ends of the timbers, cutting for the pintles, bevelling the wall ends and boring holes for the bolts.

The equipment consisted of a 36-inch swing cut-off saw, an adjustable vertical post boring machine having a 12-inch vertical and horizontal adjustment, a 42-inch band saw with 30-inch vertical clearance, trestles equipped with rolls, and chain falls arranged for swinging the timber for angular saw cuts. As electric current was available, the plant was driven by a 15 h.p. electric motor. A temporary building was erected over the plant to protect it from the weather. The machines were arranged so that the framing could be done progressively. The general layout of the timber framing plant is shown in the accompanying drawing.

The timbers were unloaded from the cars and piled near the entrance to the framing building. They were taken from the pile as needed, placed on the roll-way and pushed under the swing saw. Stops were arranged on this saw table so that no measurement was necessary, as the timbers were simply brought up against the stops and the sawing done. After the end was squared, the timber was rolled along on the roll-way and the other end was either squared or cut off on a bevel if it happaned to be a wall end timber. The timber was then rolled onward underneath the boring machine and the holes were bored for the bolts. Then a pin was placed in the top bolt hole and the timber was swung on the chain falls and the notch for the pintle was cut by the band saw. The timber was then rolled out of the building where the corners were chamfered and the two sticks were bolted together. It was then placed on teams and sent forward to the mill.



Plan of Timber Framing Plant

It was found possible for this plant to frame 100 pieces of timber a day and the labor cost was somewhat less than $1 per 1,000 feet b.m. This cost includes the labor of taking the timber out of the pile, framing, chamfering, bolting it together and placing it on a team for delivery. The total cost of the framing plant, including building and machinery, was about $1,200. The machinery cost was $500. The location of this plant was unfortunate, owing to the fact that a railroad embankment was on one side and a canal on the other side of a narrow strip of land, which did not give ample space for handling the timber, and this tended to greater cost of framing.

Kaministikwia River Bridge

The new bridge over the Kaministikwia river at Fort William, Ont., will be approached on wooden trestles, on a gradient of 1 in 20, and the bridge proper will be 330 feet long, of which the actual opening of the bascule span will be 180 feet, with 40 feet for the swing. There are to be in all, 13 pieces of concrete work to be put in position for abutments, piers and pedestals, of which six sets will be for the portion of the bridge over the river. Piers 8, 9 and 10 are for the bascule span, and of these piers 8 and 9 will be 72½ feet by 11 feet and 21 feet above foundations, while pier 10 will be 45 feet 10½ inches, by 14 feet 4½ inches, and 28½ feet in height above foundations. The swing part of the span will be carried on piers 8 and 9. The pedestals for the other spans will be 5½ feet square. The substructure will be of concrete, piles to be used in the foundations where necessary. The superstructure will be of steel, carried on steel pillars and will have a total length of 330 feet between the trestle approaches.

Structural Data on the "Herald" Building

From which Conclusions May Possibly be Formed Concerning the Recent Disaster Theory Against Sprinkler Tank Having Caused Disaster

From the report of the Canadian Fire Underwriters' Association on the Montreal "Herald" building collapse we have extracted the following particulars, which appertain principally to structural matters. The article will be of additional interest if reference is made to the photographs and details published in our issue of June 22nd last.

The building was about 110 feet in depth by from about 70 to 72 feet in width, divided into two nearly equal sections by a 12-inch brick wall (2-foot stone wall in basement).

Walls.—The east and west walls were party walls with the adjoining properties, the east wall being 12 inches on the fifth and fourth floors, 16 inches on the third, not known on the second and first, 26 inches in basement. This was a blank wall except in the basement at driveway, where there was a doorway, brick arched, 3 feet wide by 7 feet 4 inches to 8 feet high; also a small opening for coal hole, 2 feet square. This east wall is said to have been partly rebuilt, or at least repaired, after the first in the adjoining property in January, 1901. The east exposure was occupied by the Imperial Bank and other offices and sample stocks, and the Herald building was 15 feet higher than the main roof of the Imperial Bank building, and 8 feet higher than the roof house on same. The west wall was a party wall with the adjoining exposure, occupied by the J. C. McLaren Belting Company, and the wall of the Herald building was some 15 feet higher than this exposure. This west wall above the exposure was only 8 inches thick, although it appeared as 12 inches from the front at mansard roof. The wall was 12 inches at the level of the floor in the fifth storey, but the thickness below this is not known. There were no openings in this wall.

The south or rear wall was 12 inches on the fifth, fourth, and third floors, 16 inches on the second and first, and 26 inches stone in the basement. This wall was full of windows. The north or front wall on St. James street, was stone facing with ornamental columns and brick backing, except at the top floor below the mansard, where it was 8 inches thick. This front wall was of good thickness, but on account of the ornamental finish, it is hard to give the exact figure. This wall was also full of windows.

The centre wall was, as stated, 12 inches except in the basement, where it was a 2-foot stone wall, and there were also brick piers 16 by 4 inches on each side, at each bay, to the top of the second floor. This wall did not cut the roof, but extended to the under side of same. There were unprotected openings each floor in this wall, there being a brick arched opening 7 feet 9½ inches wide by 11 feet high at the first bay from St. James street, and a brick-arched opening 8½ feet wide by 11 feet 1¾ inches high at the third bay, both on the first floor. On the second and third floors, there were double brick-arched openings, 6 feet wide and about 9 feet high, with a brick pier 1 foot 9 inches between. On the fourth and fifth floors there was a single arched opening 6 feet wide and 9 feet high. There was another small doorway on the fourth floor at second bay, with wood lintel. A section of the stone wall in the basement, about 22 feet long at the front end, had been cut away, so as to make one large room for the newspaper press, and two 18-inch steel I-beams, supported on the stone walls, had been inserted to hold the wall above. There was also a small doorway at third bay, with wooden lintel over. It was also stated that on each floor above the basement there had been built in wall 14 inches by 8 inches wooden timbers, running lengthwise of the building. In other words the brick wall was broken at each floor by these wooden timbers. After the collapse, all this basement wall was intact, also the centre wall to the level of the first floor ceiling, except a small section where it was bonded with the rear wall.

Finish of Walls.—Mainly close plaster; some open finish in top storey and in basement.

Roof.—Boards on joists; gravel covering, except mansard front and rear, metal covered. There was a blind roof space from 1 to 5 feet high at the ceiling, and higher than that at the front, due to a sort of double mansard made when a portion of the roof was reconstructed in 1909.

Floors and Supports.—Fifth storey, 1½-inch, single; fourth, 1½-inch, 1¼-inch and ⅞-inch, making a total of 3⅝ inches; third and second, 1½-inch and 1¼-inch, making a total of 2¾ inches; first, 1½-inch and ⅞-inch, making a total of 2⅜ inches. All floors laid on 3 by 8½-inch joists, 23 to 26 inches on centre; joists not bridged so far as could be seen.

The joists were supported by the brick walls, and by beams running laterally with the walls and which in turn were on timbers running across the building and supported by the brick wall and by the columns. The beams and timbers are said to have varied in size on the different floors, but on the third floor the beams were 14 inches by 8 inches, and the timbers 15¼ inches by 11¼ inches. The timbers were cut away 6 inches where the beams cross them, the joists thus running parallel with, and 8 inches above the timbers. The beams and timbers formed panels or pockets, approximately 4½ feet by 19 feet, 9½ feet by 19 feet, 10 feet by 19 feet, and a few smaller, there being a number of angles to the building. The basement floor was wood on the ground. It was noted after the collapse that on the third floor, east side, in the portion of the building still standing, where the wall increased in thickness 4 inches, the space between the joists, where resting on the wall, had not been filled in. Some of the timbers across the building had a sort of truss formation in the centre. At the ceiling of the first floor, a portion of the timber inserted in the wall had broken off, but the rest is still in place.

Columns.—Fifth floor, wood, 7 inches by 7 inches; fourth floor, iron; third floor, mainly iron, some wood; second, first and basement floors, mainly iron, although there were two steel columns, said to have been inserted in 1906 in the basement at the front section near a press. On the fifth, fourth, and third floors, second, first and basement floors, there was only one row of columns down the side; on second, first and basement floors, there were two rows. On the fifth and fourth floors, west side, there was one row of columns; on the third floor, due to extra columns, there were three rows, at least in the portion of the building left standing, one row coming in at the west wall to help support the fourth floor. On the second, first and basement floors, there were two rows. The iron columns were circular in shape, except at the bottom, each column varying in diameter from 7½ inches at the top, to 8 inches at the bottom, with square base 11¾ inches and ⅞-inch thick, and of an ornamental design. The cap and pintel are said to have been of a peculiar design, consisting of an ornamental cap, a plain plate, a 3-inch iron rod or tube about 20 inches long, and another iron plate on which the column above rested. The columns were above one another, timbers not self-releasing.

Ceilings.—Third floor and blind roof space, open joist; balance mainly wood lath and plaster, with small part metal clad or wood sheathed. The plaster followed the contour of beams and timbers, forming pockets above mentioned.

Stairways.—One, encased in wood, in each section, at east and west walls at rear of buildings.

Elevators.—One, with automatic traps, and partly enclosed in wood, east side, rear. One (unused), west side, rear; boarded over and partly enclosed.

Power.—Electric motors. Some shafting in building, but how much cannot be stated.

Private Fire Protection.—"International" automatic sprinkler system, as noted; also 3-inch standpipe with hose on each floor and on roof, supplied by a 4-inch connection from city mains independently of the sprinkler system; Underwriters chemicals, fire pails, night and Sunday watchman using night watch boxes connected with Dominion Messenger & Signal Company's office.

Sprinkler Tank.—The sprinkler tank was of 12,000 U. S. gallons capacity, was erected in August or September, 1905, and was supported over the roof as follows:

Two 24-inch steel I-beams, 35 feet 7 inches long, were run from the centre wall to the east wall. On the centre wall each of these beams rested on two or three 5-inch beams, 4 feet long, embedded in concrete, and running parallel with the centre wall. As previously stated, this centre wall did not cut the roof, and at the time of the erection of the tank, it was stated that several courses of brick of the old wall at these piers had been removed and relaid in cement mortar.

On the east wall, the beams extended through the 12-inch wall, and rested on iron plates, so far as could be ascretained, the wall being built around the beams. The beams were placed 12 feet apart, and the beam nearest to the rear was some 28 feet from the rear wall. On these beams was erected the tank trestle, which was of 5 inches by 5 inches angle iron, with bracing. Two of the legs of the trestle came directly over the centre wall, and the other two legs 12 feet east of the centre wall.

The tank was enclosed in a frame enclosure, double with a 4-inch air space, as shown on the diagram, which enclosure extended only to the tank platform and not to the roof.

The total weight of the tank structure and tank filled, was estimated at 60 tons, and the design was to place two-thirds of the load, or 40 tons, on the centre wall, and one-third, or 20 tons, on the east party wall.

The C. F. U. A. last inspected the tank on February 15, 1910, at which time it was found full. It had also been found full at other inspections, except on one occasion when the insured had notified the office that it had been emptied to repair leaks. The engineer of the Herald testified that it had been examined by him two weeks before the disaster, at which time it was full. He had also tested it by the overflow tell-tale since then and found it full. From the usual attention given the fire apparatus by the insured, it can reasonably be assumed that the tank was full.

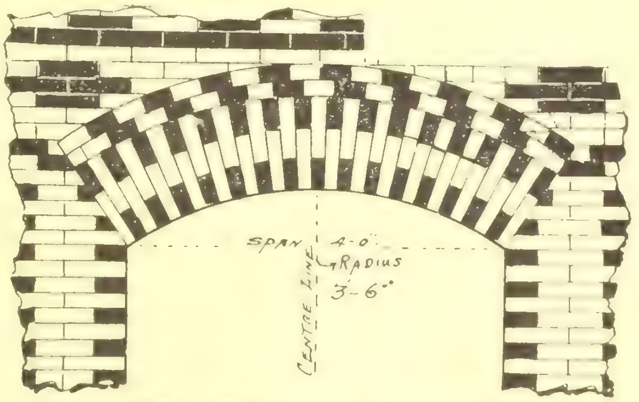
Theory Against the Sprinkler Tank Having Caused the Disaster.—The sprinkler tank was found some 20 feet (in a horizontal line) away from where it stood, and on the opposite side of the wall. It was also found well down in the debris, and standing almost upright. The staves and hoops were largely grouped together, as shown in the photograph. The tank was partially burned, particularly at the top, but, as the staves were being taken out, it was noted that the "croze" for the bottom of the tank, was at the bottom of the pile. One of the steel girders was bent, and the trestle badly bent and broken, but this could have been due to the fall and the fire. One girder was found lying across the centre wall, and the other on the debris, west side.

If either of the steel girders had given way first, the tank would have fallen in the east side. The same would have happened if the east legs of the trestle had buckled. If the west legs had buckled, the natural tendency would have been for the tank to have tipped in falling, and been largely broken up in falling through the floors, and the floors would not have been taken clean as they were. The rear wall fell largely into the lane at the back of the building, and it would appear as if the rear and centre walls had gone out with the floors, and the tank had slid bottom down into the opening already provided. It is not likely that the tank would have turned a complete somersault in falling and remained together.

Effect of Variegated Brickwork

By Owen B. Maginnis.

This never ending detail of building construction seems almost unlimited in its application, not only in the numerous designs which are evolved by the use of the ordinary common brick or brick front, but also with special brands made by different manufacturers. In this short article we will consider the matter of colored and enamelled brick. The question is now a matter which architects are earnestly engaged in developing to the betterment of their designs, both in artistic beauty and constructive strength, obtaining both in unison.



Effect of Variegated Brickwork.

It is not very usual to employ enamelled brick for the exterior elevations of buildings for the reason that the surfaces, through the deposit of dust, wind and rain, will become streaky and discolored and incapable of being washed or cleaned. In addition to this the cost of the brick is extreme, as the best enamelled brick are imported from Europe, and the duty being heavy, they are rarely employed except on the very best class of public or private structures. Very fine brick are now made in many colors, whereby various combinations may be obtained, according to the taste of the architect. These are mostly rough on the edge and end, like ordinary rough brick, but very effective if properly laid out. These front brick are supplied by the manufacturers in almost all the well known colors or shades of colors, mottled, speckled or lined; also in the form of stones, as rock-faced, wash face, etc. The effect of the combinations is usually forecast by building a small sample, observing another design already built, or by a colored drawing. In straight perpendicular work the observance of the bonds and the placing of the headers and stretchers is the only part of the workmanship to be watched, but in the construction of arches much more is required. The attached sample will illustrate to the reader the value of the care which must be exercised in the laying of colored front, or enamelled brick. It represents an arch in the basement of a public building piercing a 28-inch wall, both sides, jambs and soffit of the walls and arch being laid in blue and enamelled brick, the black denoting the blue and the white the primary color. The headers are blue and the stretchers white. Extremely careful cutting or setting must be followed in this example, especially in the cutting of the voussoirs of the arch, which is generally done on the works, though they are sometimes moulded at the factory from a full-size detail furnished by the architect or the factory's draftsman. To save time and unnecessary labor, it is the practice to supply one-half the elevation and soffit, as it is reversible from the centre line working both ways, unless the sides be of different colors, or the jambs be splayed; then details must be made for both sides. In conclusion, it might be said that only the actual manual practice will ever enable any mechanic to lay up such an arch as is here represented, even were it of common brick.—American Carpenter and Builder.

The Economics of Concrete Construction

Saving Effected by Use of Gravel Concrete—Some Interesting Costs in Proof — Relative Values of Various Materials[*]

By A. B. Hewson.

The rapidity with which concrete has risen to its present position in building construction is only equalled by the growth in complexity and diversity of the work of the modern architect.

The architect has risen to every new demand of an ever-shifting situation, with wonderful results, but his days are so full of a never-ending succession of problems demanding instant solution, that he has little time for exhaustive research along any one line.

I shall compare only the relative values of washed gravel and crushed limestone in combination with torpedo sand; this comparison, I believe, covers local questions of economics.

I propose to prove that any given quantities of gravel, sand and cement mixed in the generally used proportions such as 1:2:4 or 1:3:6 will make at least 7½ per cent. more concrete than like quantities of crushed limestone, sand and cement.

I propose to prove, as a matter of sequence, that on an even basis of price for gravel and crushed stone, graven concrete costs in place at least 32c. per cubic yard less than limestone concrete on carload delivery of materials, and at lease 39 cents per cubic yard less on team delivery. Incidentally, I call your attention to the fact that the market price of gravel averages 10 cents per cubic yard less than limestone.

The explanation of the greater bulk of gravel concrete is that gravel, on account of the rounded shape of its particles, averages 7½ per cent. less in voids than crushed stone. When you mix concrete 1:2:4 or 1:3:6 you have 50 per cent. of sand to fill the voids in the coarse aggregate. If the voids in crushed stone absorb 95 per cent. of the sand and the voids in the gravel only 80 per cent., it naturally follows that 15 per cent. more of the sand appears in the gravel concrete, thereby increasing its bulk 7½ per cent.

Practically all authorities agree that the voids in the average washed gravel are 40 per cent., and in the average crushed stone 47.4 per cent. That this is true of Chicago's gravel and limestone is proven by a comparison of the standards used by the trade in reducing the weighed materials to the selling unit of the cubic yard:

Limestone	2,500 pounds per cubic yard
Gravel	3,000 pounds per cubic yard

Assuming the standard for limestone to be correct, and that of gravel unknown, other things being equal, we have the following proportion, the weights of the two materials being in inverse proportion to their voids:

$$x : 2{,}500 : : 47.4 : 40$$

This produces gravel at 2,960 pounds per cubic yard. Allowing the 40 pounds difference to cover the greater density of the gravel due to the presence of a large proportion of granite, trap and other igneous rocks heavier than limestone, we demonstrate conclusively the relative voids to be substantially as stated.

Let me demonstrate it:

Carload Delivery

Limestone Concrete

Stone, 100 cubic yards, at $1	$100.00
Sand, 50 cubic yards, at $1	50.00
Cement, 175 barrels, at 85 cents	148.75
	108.5: 298.75
	2.75⅓

Gravel Concrete

Gravel, 100 cubic yards at $1	$100.00
Sand, 50 cubic yards, at $1	50.00
Cement, 175 barrels, at $1	148.75
108.5 divided by 7½ per cent. equals	116.64: 298.75
	2.56
Number of cubic yards concrete 1:2:4 produced by above quantities according to "Thompson & Taylor" minus voids per cent.	47½
Limestone concrete cost, per cubic yard	$2.75½
Gravel concrete cost, per cubic yard	2.56
Saving on materials	$0.19 1/3
7 per cent. cost of handling and mixing figured at $1.85 per cubic yard	.12 9/10
Total saving	$0.32 1/3

Team Delivery

Limestone Concrete

Stone, 100 cubic yards, at $1.50	$150.00
Sand, 50 cubic yards, at $1.50	75.00
Cement, 50 cubic yards, at $1.50	75.00
Cement, 175 barrels, at $1	175.00
	108.5: 400.00
	3.68⅔

Gravel Concrete

Gravel, 100 cubic yards, at $1.50	$150.00
Sand, 50 cubic yards, at $1.50	75.00
Cement, 175 barrels, at $1.00	175.00
	116.64: 400.00
	$3.42 9/10
Number of cubic yards concrete 1:2:4 produced by above quantities according to "Thompson & Taylor" minus voids per cent.	47 1/2
Limestone concrete cost, per cubic yard	$3.68 2/3
Gravel concrete cost, per cubic yard	3.42 9/10
Saving on materials, per cubic yard	$0.26 11/30
7 per cent. cost of handling and mixing figured at $1.85 per cubic yard	.12 9/10
Total saving, per cubic yard	$0.39 1/2

---

[*] Paper read before the Architects' Business Association of Chicago.

If large consumers find it profitable to buy coal on the basis of the number of pounds of water a given quantity will evaporate, why should not the architect buy concrete on the basis of the amount produced by a given quantity of materials, particularly when the materials producing the maximum bulk produce also the maximum strength.

So many widely varying strength test figures have been issued by crushed stone and gravel men showing results in favor of their respective materials, that I have considered it ill advised to add to the collection. I therefore have placed in your hands extracts from data published by the United States Geological Survey which are the first comprehensive statistics on concrete ever published by our government.

Uncle Sam spends upwards of $30,000,000 yearly on public buildings, and Congress, realizing the possibilities of economy from a proper selection of building materials, established the Structural Materials Division of the United States Geological Survey for the accumulation of data on the relative values of various materials through the medium of an elaborate systematized series of tests.

Bulletins setting forth these tests and their results are published and sold by the Superintendent of Documents, Washington, D.C., for the information of such as desire them, and cover a wide field of research.

These tests are especially valuable, coming as they do with the weight of unprejudiced authority and having been conducted with the advice and assistance of the most eminent engineers in the country. The facts concerning the decrease in strength of limestone concrete mixed to the wet consistency are of peculiar interest. The uniform superiority of gravel concrete in ultimate strength under all conditions and its superiority at all ages in the medium and damp consistencies, is most conclusive.

It is peculiarly conclusive in relation to local conditions since the gravel tested was about 8¾ pounds per cubic foot lighter than our Chicago gravel and the limestone about 4⅓ pounds per cubic foot heavier. Notwithstanding this handicap, the gravel excels. Furthermore the specific gravity of the gravel tested was less than that of the limestone, while the specific gravity of Chicago's gravel is greater than its limestone.

There is another point of importance in the economics of concrete.

It is agreed that the strongest concrete is that in which there is just sufficient sand to fill the voids in the coarse aggregate plus a small percentage to cover inequality in mixing, with the same conditions obtaining between the sand and cement.

When you add more sand than this, you weaken your concrete.

Does it not follow that, if gravel concrete excels limestone when compared in identical proportions, it would still further excel in comparisons where the sand is in the same proportion to the voids in both materials? For illustration, would not a 1½ : 3 : 7 gravel concrete excel a 1 : 2 : 4 limestone concrete? Would it not be proportionately rich in cement? Would it not give an equal bulk of concrete and a greater strength efficiency with less sand and less cement?

Furthermore, if a 1 : 2 : 4 limestone mixture produces a smooth finish, will not a 1½ : 3 : 7 gravel concrete do the same since the proportion of mortar to the voids is identical in both cases?

In view of the fact that the consistency in which concrete is mixed is a large factor in its strength, would it not be well to regulate the quantity of water used as carefully as you do the other elements? It will give your walls and floors uniformity of strength It will make your stress figures more dependable, and your factor of safety less wasteful.

In confined spaces where the intervals between the reinforcing bars are small or the concrete must be forced through wire mesh, a denser and therefore stronger concrete can be obtained with gravel. The rounded particles work into place more readily and lie snug to the steel. There are few jagged edges to catch on the steel or on companion particles forming pockets which reduce the strength and damage the appearance of the surfaces.

Gravel concrete, properly proportioned, will produce water tight walls where limestone will fail under the same conditions. This is also due to the lesser proportion of voids and the closer association of the particles.

Marble in British Columbia

The annual report of the Minister of Mines of the Province of British Columbia for the year 1909 has just made its appearance. While this is devoted mainly to coal and the metals, it makes brief reference to the structural and decorative materials. The report says that excellent building stone of various sorts is found in abundance in almost every part of the province, but the fact of its widespread distribution has, however, been somewhat against the establishment of large quarrying industries, as a sufficient local supply could always be obtained, and, except within reach of the larger cities, few regularly equipped quarries have been opened. On the coast, chiefly between Vancouver Island and the mainland, there are several well equipped quarries taking out granite, sandstone, and andesite, all of excellent quality. These quarries supply the stone building material of the coast cities, and also export to the United States.

In the interior of the Province, the Canadian Marble & Granite Company opened a marble quarry on the line of the Lardo-Trout Lake Railway, about 8 miles from Lardo, and took during 1909 block marble which, when sawed into slabs, amounted to some $30,000 in value. This company formerly shipped the rough blocks of marble which were elsewhere sawn into slabs, etc., but during the past year the company has been busily engaged in erecting at the quarries large and well equipped dressing works, so that by next season the marble will leave the works in the finished state. During this period of construction the product shipped from the quarry has been comparatively small.

The Nootka Marble Quarries, on Nootka Sound, on the west coast of Vancouver Island, that were opened up in 1908, have not made any very important shipments, and information as presented by the board of directors indicates that some $3,000 worth of marble is on hand at the quarry, but does not show that any sales were made. The quarry has not been operated since July, 1909.

Fifteen milions is the rough estimate of the cost of deepening the Saskatchewan river in connection with the proposed waterway from Edmonton to Winnipeg. This is exclusive of the canal works, which would be necessary to overcome Grand Falls.

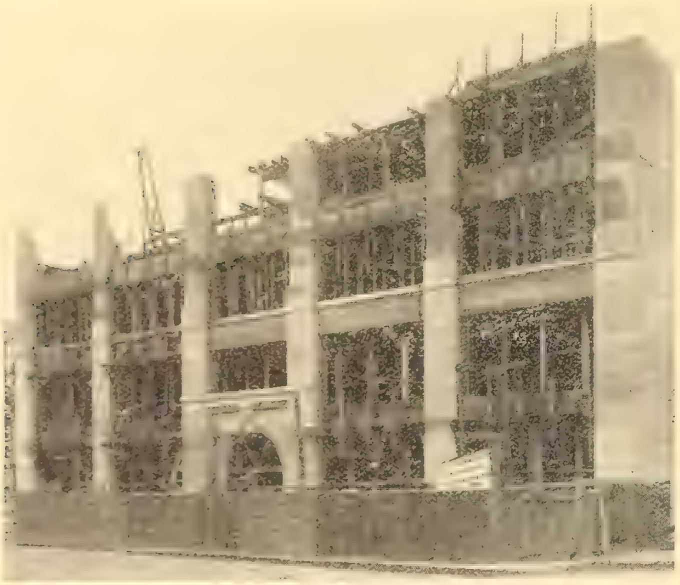
The Northern New Brunswick & Seaboard Railway from Black's Cut, on the Intercolonial Railway, to the iron ore mines at the confluence of the Austin brook with the Nipisiguit river, Northumberland county, N.B., has been practically completed, some ballasting being all that is required to permit it being opened for traffic. The contractors were Wheaton Bros., and J. J. Taylor was engineer in charge of construction. J. J. Drummond, F. McDougal and W. F. C. Parsons, of the Canada Iron Corporation, which owns the mines and railway, recently made a visit of inspection to the property. The ore dock at Newcastle, which is being built by Reid & Archibald, is expected to be ready for operation Sept. 1. The spur line from the Intercolonial Railway to the ore dock at Newcastle has been completed

Winnipeg's Bid for Building Supremacy

Facts and Figures which Argue well for the Progressive Western City—Some Notable Contracts, with Photos of Construction

Winnipeg, Aug. 20th, 1910.

This city is to-day the Mecca of building tradesmen. At present there are more than 1,500 buildings for various purposes in different stages of construction throughout Winnipeg. In the limits and suburbs there are almost an additional thousand represented in small homes and business places which are drawing upon Winnipeg artisans for labor. That the labor market has withstood the strain of the exceptionally heavy demand is only owing to the big influx of mechanics this year and to the fact that many immigrants who came west on other missions have been attracted into the field by the wages paid and the favorable working conditions adopted by contractors. The amicable settlement of union disputes in the early spring was fortunate for those who intended building, for since that time there has been practically no difficulty.



7-Storey Garage for the Canada Cycle & Motor Company
J. McDiarmid & Co., Contractors

A visit paid at present to the central portion of the city will reveal the nature of the tremendous development of Winnipeg. There is scarcely a block in which there are not some traces of the builder.

The percentage of work which has been completed is very small, leaving about seven of the eleven million dollars' worth started this year still under construction. On all this, work appears to be progressing very favorably. Most contractors have now secured all their jobs for the year, and are devoting their attention to contracts already commenced.

The supply of material is quite adequate and between now and winter there should be no abatement. Brick, cement and lumber, as well as stone, are now heavily stocked in the city to insure against any such shortage as occurred during the early spring, hampering work to the extent of two or three weeks.

Many Important Contracts Under Way

In the limelight of building contracts at present are the Union Depot, the Bank of Montreal, and the Great West Life building. The solidity of construction provided for by the plans of the Bank of Montreal, has necessarily delayed, to outward appearances, work on the structure. The work on the base and foundations is proceeding well, however, and as much steel work as it is possible to place, under the conditions, has been set up. This contract will not be completed for another year.

The new Union Depot, progress on the erection of which was detailed very completely in the "Contract Record" of July 20th last, is now a reality. The outside work on stone and steel is finished and the carpenters and marble workers are busy with the interior work and decorations. The contractors, Lyall-Mitchell Company, state that the structure will be open to the public within two months.

Bank of Montreal's New Winnipeg Building in Course of Construction—Norcross & Co., Contractors.

The Great West Life building, on Lombard street, is the most imposing edifice put up this year. C. W. Sharp & Son, contractors, have recently taken out a permit for the completion of the structure. The price was $175,000, which speaks well for the finish of the interior.

One of the most notable works of the year is the 200-foot chimney for the power house for the T. Eaton Company. The height of this chimney from the grade line is 185 feet. At the base its diameter is 15 feet, tapering to 7 feet 6 inches at the summit. There are 220 cubic yards of concrete in the base of the chimney. This base is 37 feet 6 inches square and 6 feet deep. In all approximately 127,000 brick were used in the chimney. This stack is the highest in western Canada and one of the highest in the entire Dominion.

In addition to these buildings there is the 7-storey garage for the Canada Cycle & Motor Company, the McLaren hotel and the Orpheum theatre, some 50 apartment blocks and dozens of warehouses.

Builders' Ultimatum to Strikers

A somewhat drastic action was taken by the Builders' Exchange on August 19th, following their ultimatum to the masons and bricklayers offering the workmen the chance of returning to work at once on the Lyall-Mitchell Company's buildings or the alternative of being locked out. The men

The Great West Life Building, Winnipeg—C. W. Sharp & Son, Contractors

chose the alternative and the lockout went into effect automatically.

The trouble with the Lyall-Mitchell men arose through orders received by the workmen from Montreal where the union is at variance with Peter Lyall & Sons, owing to the firm's declaration for open shop. The men employed by the Lyall-Mitchell Company of Winnipeg claimed that the concern for which they were working and the Montreal firm were one and the same and quit work in sympathy with the strikers in the eastern metropolis. This was on Monday, August 15th. The Winnipeg Builders' Exchange gave the men until August 19th to show up and when they did not return every contractor connected with the Exchange notified the men that their services would not be required after noon. There are between 600 and 800 affected, and while the situation is serious at the present outlook it is too early in the day to indulge in pessimistic predictions.

200 foot Chimney Erected this Season at the T. Eaton Company's Power House, Winnipeg

From the Federal Capital

How the International Plasterers Succumbed—Contractors Busy on many Important Commercial Buildings

Correspondence of the "Contract Record."
Ottawa, August 20th, 1910.

The plasterers' strike, the only thing this year to interfere with building operations in this city, has practically died out and contracts are being completed under normal conditions. Until last spring the National Union of Plasterers was the only one actively in existence in this city. Then a number of plasterers from outside Ottawa came in and first joined this union. Later they changed their allegiance to the International body. For a time they maintained that the National Union of Plasterers had dissolved. When the International Union struck for an increase in wages from 40 to 45 cents, however, a large number of plasterers remained at work and showed that the National organization was very much alive. This union had an agreement with the contractors for a minimum wage of 40 cents an hour, binding until next May, and the men of this union at the time it was signed refused to make it void by changing to the International. There were enough of these men to keep up with the work in hand. While the International men claim that a number of contractors have signed to pay a compromise price of 42½ cents an hour, the contractors produce lists to prove that at most only two of their number have signed such agreements.

Money has been somewhat scarce during the past month or two, but not sufficiently so as to hold up work. Most of the builders had arranged their loans earlier in the year and were not affected at all.

The larger contractors have been pretty well tied up with the important commercial buildings this summer and have left residence work alone. For this reason, principally, there are not so many residences to be completed for September 1st as at this time last year. This, however, is rather a good thing. In former years there was a continual cry that Ottawa was over-housed and the slackness in building this summer, in this class, will show that Ottawa is growing so fast that any reduction in residential building will make houses scarce for the winter. Hundreds of families give up their houses on May 1st to live during the summer months in some of the resorts which are connected with electric railway to the Capital. They are returning now and the prospect is that houses will be scarce, a condition that will stimulate building during the winter and next summer.

The buying of building lots this month is very active. One firm sold 151 in two days in Ridgemont Park, about a mile from the city. On many of these lots residences will be erected at an early date.

The Ottawa Improvement Commission will begin work beautifying Nepean Point next week and will continue to Sussex street as soon as the houses are demolished on the property bought by the city for conversion into a park. There are about 15 of them which will be sold by auction. It is expected that the improvements will take about two years.

Indications are that the Government will not begin the erection of the departmental buildings on Sussex street and Mackenzie avenue for at least a year. Tenants have received such intimation. Some of the residences, however, will be converted into temporary office buildings.

Builders' supplies are fairly plentiful now. The shortage of brick is to a great extent overcome. Some of the architects report difficulty securing terra cotta and other lines shipped from Great Britain.

Vancouver and Coast Correspondence

No Cessation in Building Activity — Erection of Residences Striking Feature Ample Supplies of Building Material — Prices Well Maintained

Vancouver Office of the "Contract Record."
Vancouver, B.C., Aug. 19th, 1910.

The tremendous activity in Vancouver's building operations is being commented upon everywhere. Every citizen of Vancouver is firmly convinced as to the wonderful future ahead of his city, but all are so busy trying to make money to invest in property or business enterprises that few have time to keep in touch with the tremendous development in progress. In the business section the huge new office buildings force themselves upon the attention of all. Half a score of large business blocks and wholesale warehouses are under way in the downtown section, and about the same number of modern apartment blocks are under way in the west end and elsewhere. As for new dwellings, they are being completed at a wonderful rate by an army of workmen, yet so large is the influx of new population that it is impossible to supply the demand. To show how acute is the situation, even at present, the owner of a large apartment, which will not be completed inside of two months, has already rented the 42 suites it will contain, having had over 200 applications.

At the present time leading contractors estimate that about 30 per cent. more building is being carried on this season than last, while the larger average size of the structures really increases the percentage to about 50 per cent. Contractors state that building operations during last winter were unusually heavy, and owing to the shortage of dwellings they anticipate a steady run of work during the bad weather season to come.

So much for the city, the small boundaries of which limit the scope of Building Inspector Jarrett's monthly permits. But the returns, while large, fall far short of the actual totals, as no account is taken of the enormous amount of building that is continually in progress in the populous suburbs of South Vancouver and Hastings. Steps are being taken to have these and other suburbs taken into the city, when beyond doubt Vancouver will head the list for the Dominion, month after month.

Something About Trade Conditions

Business is so good with the contractors' supply firms that they cannot hire enough vehicles to deliver their orders as promptly as desired. As a result small orders from the outskirts have to be held back. Early in the season there was a shortage of brick owing to the winter building carried on, but supplies were secured from Seattle until the Vancouver Island, Howe Sound and Fraser River yards began delivery. Granite, structural iron, sand, gravel, etc., came to hand in sufficient quantities to suit the builders. The proximity of lumber and shingle mills made it easy to secure the enormous supplies needed in these lines, but at times there was a famine in sash and doors. The local factories were operated to the limit, yet the Wheeler & Osgoode Company, of Tacoma, Wash., and the Robinson Company, of Blaine, Wash., found a market here for numerous carloads. These firms, it is said, do not turn out stock that compares in quality with the products of Carnish & Cooper, Robertson & Hackett and the E. H. Heaps & Company factories, and there is room for a big expansion in this branch of trade. "Give us a big custom factory capable of supplying us with all kinds of interior trim!" is the cry of the contractors.

The statistics for July prove that Vancouver's wonderful record of progress is being well maintained, the increases running from 50 to 80 per cent. over the same month a year ago. Bank clearings, July, 1910, were $37,630,303; July, 1909, $22,937,715; July, 1908, $15,690,197. Land registry receipts: July, 1910, $14,752.94; July, 1909, $11,843.70. Building permits: July, 1910, $639,380; July, 1909, $549,107. For the seven months of 1910 ending with July the total is $7,525,260, and for the whole year of 1909 were $7,258,565.

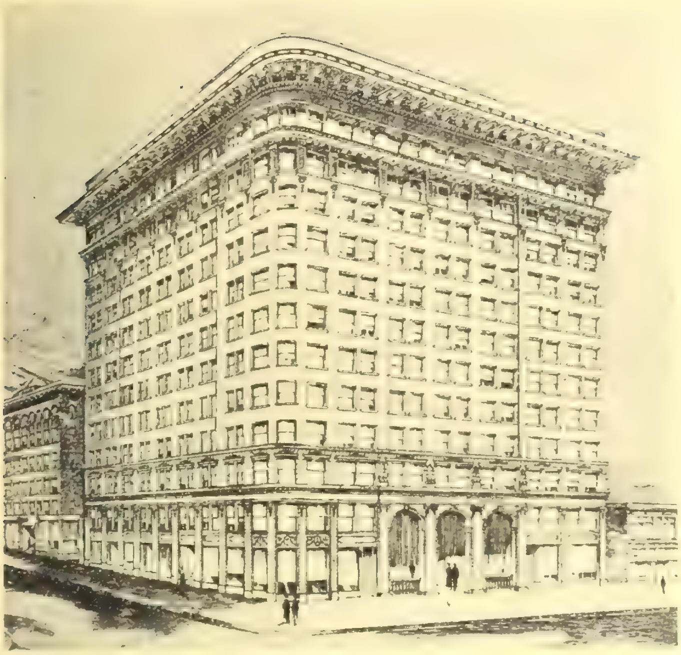
Prices of Building Materials

(Delivered on Job)

Building paper, tarred, per roll, 90 cents.
Building paper, plain, per roll, 70 cents.
Bricks, common, per 1,000, $13.
Bricks, pressed, per 1,000, $40 to $62.
Cement (Vancouver), per barrel, $3.10.
Roofing felt, per 100 pounds, $2.45.
Fire brick (Scotch), per 1,000, $45.
Fire brick, small quantities, $48.
Lime, per barrel, $1.35.
Sewer pipe, per foot, 4-inch, 18c.; 6-inch, 33c.
Plaster of paris, per ton, $18.50.
Putty, per pound, 5 cents.
Tar, 4-gallon tin, $1.25; per barrel, $8.50.
Hard wall plaster, per ton, $17.50.
Nails, base, $3.25.
Nails, cut, $4.25.
Mixed paint, gallon, $2; ½-gallon, $1.10; quart, $60c.
Boiled linseed oil, gal., $1.40; barrel lots, per gal., $1.20.
White lead (genuine), 100 pounds, $8.
White lead, No. 1, per 100 pounds, $7.50.
Varnishes, furniture, 80c., $1; hard oil, $1.75; elastico-oak, $2; elastico-floor, $3.25.
Sash cord, per pound, 50 cents.
Sash weights, per 100 pounds, $3.
Tacoma hair fibre, per ton, $18.
Fire clay, per ton, $20.
Plate glass(35 per cent. off local tariff).
Sheet glass (10 per cent. off local tariff).
Expanded metal lath (Hays'), 27 cents per square yard; Herringbone lath, 17 cents per square yard.
Ready roofing (Cendor brand), ½ ply, $2.25; 1 ply, $2.65; 2 ply, 3.40; Malthoid, 1 ply, $2.75; 2 ply, $3.25; 3 ply, $3.70.
Hexagon floor tiling, average 55 cents per square foot.
Wall tiling, average 60 cents per square foot.
Turpentine, per case, $10.
Resin, per pound, 5 cents.
Elephant lead, per 100 pounds, $8.

Monster Vancouver Office Building

The accompanying view is the perspective of a building to be erected at the corner of Homer and Pender streets, Vancouver, B.C., by the Consolidated Building Company, Limited. The building will have a frontage of 104 feet on Pender street and 120 feet on Homer street, with a lane at the rear on the south side. The building will contain 12 storeys and basement, with steel frame work, and will be as nearly fireproof as possible. The exterior of the building will be faced with pressed brick and sandstone. All of the steel columns and girders will be encased with fireproof materials and all interior partitions will be constructed of hollow fireproof partition tile, plastered on both sides. The floors will be constructed of steel beams and reinforced concrete. The finished floors in the basement and first storeys and in all lavatories and corridors throughout the upper storeys will be of marble mosaic tile. The finished floors for offices in the



Proposed Consolidated Buildings, Vancouver—Donellan & Donnellan, Architects.

upper storeys will be of smoothly trowelled cement, covered with cork carpet. All windows will have metal sashes and frames will be glazed with plate glass.

The basement will be arranged for a modern cafe and dining room with accommodations for 500 guests, and will be thoroughly ventilated by means of exhaust fans connected with an air chamber, from which ventilating flues will extend above the roof. The boilers, pumps, engines and electric motors for generating heat, light and power will also be placed in the basement.

The approaches and steps leading to the basement and first storey from the exterior of the building will be of granite. All interior stairs will be of marble, supported on steel framework, and will have ornamental bronze railings and newel posts. The walls and ceilings of the entrance lobby and corridors on the first storey, and the walls and ceilings around the basement entrances will be faced with polished Alaskan marble. All corridors and toilet rooms on the office floors above the first storey will have marble wainscoting.

The first storey of the building will be used for stores. The upper floors will each have 28 offices, making a total of 308 offices on the eleven floors, in addition to the toilet rooms. Several of these offices on each storey will be provided with fireproof vaults constructed as parts of the building. The architects are Donnellan & Donnellan, 319 Pender street, Vancouver.

Salvation Army "People's Palace," Vancouver, B.C.

A view of the fine new building to be erected by the Vancouver branch of the Salvation Army is shown herewith. The lot chosen on Powell street runs through to Alexander street, the situation being close to the docks and railway. The available frontage is only 25 feet, and to compensate for this the building will be ten storeys in height. The cost will be about $85,000. Branch buildings are to be erected in other parts of the city, the total outlay anticipated being $150,000. Major Phillips is the officer in charge. The architect is Mr. Thos Hooper, who has designed many of Vancouver's finest buildings.

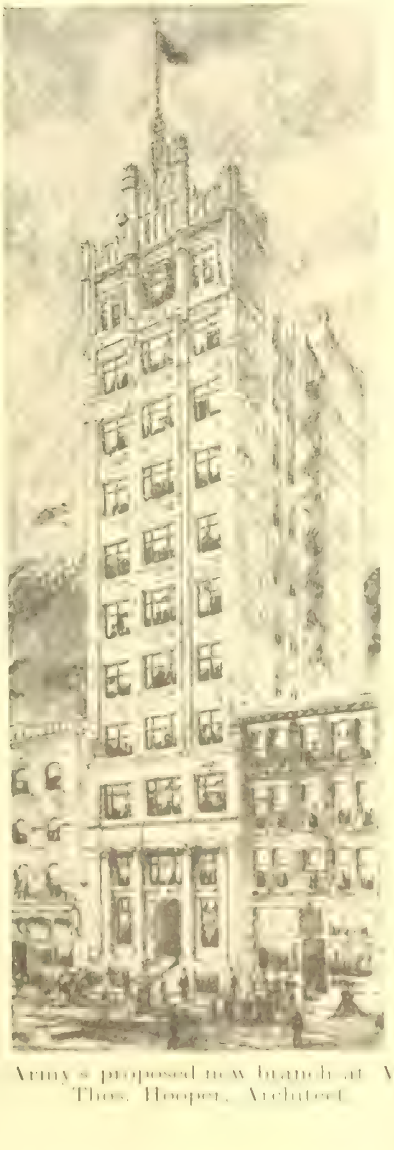
Some Cood Pipe Contracts

Manager O. C. Shultz, of the Pacific Coast Pipe Company, Vancouver, is a busy man these days. The fine plant of the company is turning out pipe at a rapid rate in order to clear the way for a start on two big contracts for municipal water systems. One comprises 72 miles of wood pipe for Richmond municipality, on Lulu Island, the tender price being $69,961, and the other covers 60 miles of pipe for Ladner municipality, the tender figure being $79,820. These contracts will be filled simultaneously, so that the laying of the pipe may be commenced in the near future.

Newsy Items from the Western Province

The Canadian Wood Pipe Company are now comfortably located in their new factory on Pacific street, north-east end of Granville street, and Manager Macgregor is happy. The capacity of the new plant is more than double that of the old one, the increase being rendered necessary by new business. Among recetn contracts booked we may mention one from Revelstoke Council for 20,000 feet 12-inch pipe and 4,500 feet 10-inch, also 13,000 feet of 6-inch pipe for the C.P.R., to be used for conveying water to their prairie roundhouses. Another C.P.R. order is for an inverted siphon to convey water across a valley for irrigation purposes, 1,800 feet of pipe 53 inches in diameter being required. This is a large pipe, but the company once supplied a section of pipe 84 inches in diameter to the B. C. Electric Railway Company.

Mr. H. Pim, manager of the Vancouver branch of the



Salvation Army's proposed new branch at Vancouver
Thos. Hooper, Architect

Canadian General Electric Company, is convalescing after an operation for appendicitis.

Several months ago the Sumner Iron Works, of Everett, Wash., which is engaged largely in the manufacture of logging and other heavy kinds of machinery, purchased thirty acres for a manufacturing site in block 124, Burnaby, between Vancouver and New Westminster. For weeks past it has been known that the machinery was ready at Everett to be shipped on an hour's notice, and it is now announced that clearing will begin immediately. In order to protect certain patent rights, the plant must be in operation by next March, so that the owners have no time to lose.

Crude oil is likely to come into general use for heating Vancouver's public buildings. Recently a most successful demonstration of the Jordan crude oil burner was made at the King Edward high school. The crude oil is completely atomized, and as the lighted gas leaves the burner under strong pressure it makes a great blaze and gives forth a tremendous amount of heat, which is stored in the collecting chamber and thence distributed by means of large pipes to the various parts of the building.

The building permits issued in Victoria during July aggregated $222,290, bringing the total for the seven months up to $1,425,125, compared with $1,161,320 for the corresponding period last year.

Mr. H. M. Burwell, of the firm of Hermon & Burwell, engineers, declares that Vancouver can save one million dollars in the next fifty years by making provision for water mains on the new Second Narrows bridge.

The burning of the British Columbia Oil Refining Company's plant at Port Moody, B.C., early in the month, made a spectacular blaze and occasioned a loss of about $100,000. Just before midnight Edward Conyers, night engineer, attempted to descend into an oil tank with an electric light in his hand, when a tremendous explosion occurred, which carried him high into the air and scattered burning oil in all directions. The contents of twenty similar tanks successively caught fire and were consumed, along with two carloads on the C. P. R. track, and a large shipment of asphalt on the wharf. Five-sixths of the plant was destroyed, but a large tank containing 25,000 gallons of oil was saved, together with two smaller ones, by the use of chemicals, which smothered the flames.

The B. C. Electric Railway Company will shortly possess a third line between Vancouver and New Westminster, passing through East Burnaby. Contractor M. P. Cotton has a large force of men at work and a considerable stretch of roadbed will soon be ready for the track layers.

The new plant of the Dominion Carbolineum Works makes an important addition to South Vancouver's list of industries. The buildings have been under construction for about six months, and the work has been carried on under the personal supervision of Manager Harpie. Previously the business had been carried on at Coal Harbor, Vancouver, in cramped quarters, and the rapidly increasing trade compelled better facilities. The new plant has been designed to answer all demands for years to come, and combines a well equipped sawmill and modern creosoting equipment capable of treating large timbers and paving blocks at a rapid rate. The daily output of the plant is about 85,000 feet, and in addition to the large local demand there is reason to believe the prairie towns will call for large quantities.

In order to protect the Seymour creek water supply, the Vancouver city council has purchased 160 acres of land at the falls, four miles above the intake point. The purchase of existing timber limits along Capilano, Lynn and Seymour creeks is also being considered as a protective measure.

The Hamilton Wire Works is erecting a branch plant on Lulu Island, New Westminster, to employ 100 men. The company will supply the trade in British Columbia and as far east as Saskatchewan.

North Vancouver city is experiencing a steady building boom, many homes going up in the outlying sections. From Capilano in the west to Lynn Creek in the east, there is great activity visible. With the long-talked-of bridge now within range, the coming of the Imperial Car Company, and the prospective railway, North Vancouver's future is assured.

The city of Victoria is supplied with water by the Esquimalt Waterworks Company at six cents per thousand gallons, while Vancouver is charging adjoining municipalities ten cents for the same quantity. On the face of it this would seem a strong argument against municipal ownership.

Mr. W. Owen, an English civil engineer, has been in Vancouver in the interests of a group of English capitalists who intend establishing large steel works here for the manufacture of steel rails, angle bars, wire goods and tin plates. Mr. Owen is reported to have acquired an option on 50 acres of land at Port Mann, on the Fraser river, opposite New Westminster. The enterprise will involve an expenditure of about $15,000,000 in the acquisition of sites, coal and ore supplies, erection of buildings and installation of plant. Employment will be furnished to upwards of 2,000 men.

The new provincial home for the insane, to be erected at Coquitlam, B.C., will be absolutely fireproof throughout, the plans showing massive structures of concrete, stone and steel. The work of construction will be commenced this fall.

The British Columbia Telephone Company, in addition to doubling the size of their main building on Seymour street, has let a contract for a branch exchange at the corner of Tenth avenue and prince Edward street. It will be four storeys, of pressed brick, with cut stone front.

Taking over the water records on Seymour creek held by Point Grey and South Vancouver, damming the waterfall on Seymour creek to hold back the stream for a distance of four miles at a cost of between $60,000 and $75,000, and constructing a third water main system across the inlet and through the suburbs, are the steps which Mayor Taylor thinks will soon be necessary in order to keep up with the water needs of a greater Vancouver.

The new dredge to be constructed in England to carry out the improvements to be made by the Dominion Government in Vancouver harbor will be one of the most powerful on the Pacific coast. She will be able to dredge to a depth of 50 feet, and handle 1,000 tons of material per hour. The harbor entrance at Prospect Point is to be approximately trebled in width and made deep enough to serve the largest steamer at any stage of the tide. It is expected that the dredging will finally result in diminishing the tidal current in the narrows by at least one-third and almost entirely eliminate the dreaded tide-rips.

Mr. Wynn Meredith, the eminent San Francisco consulting engineer, who is in charge of the British Columbia Electric Railway power development enterprise at Jordan River, Vancouver Island, spent a few days in Vancouver recently. He was accompanied by Mrs. and the Misses Meredith.

Good progress is being made on the waterworks system being constructed in Delta municipality, south of New Westminster. In all 50 miles of wire wound wooden pipe will be laid, the contract for which was awarded to the Pacific Coast Company, of Vancouver, at $79,820.10.

The municipality of Point Grey, adjoining Vancouver, to the south, has the honor of having the lowest tax rate among the organized districts of British Columbia—4 45/100 mills on the dollar on improved lands and 8 5/100 on wild land. The total value of real estate property is $15,181,367, and the total tax levy is $85,000. By-laws recently passed authorize the expenditure of $500,000 for a water system, $250,000 for sewers, $100,000 for roads and $100,000 for parks.

The Best HOIST in Canada

Note Well the Exclusive Features

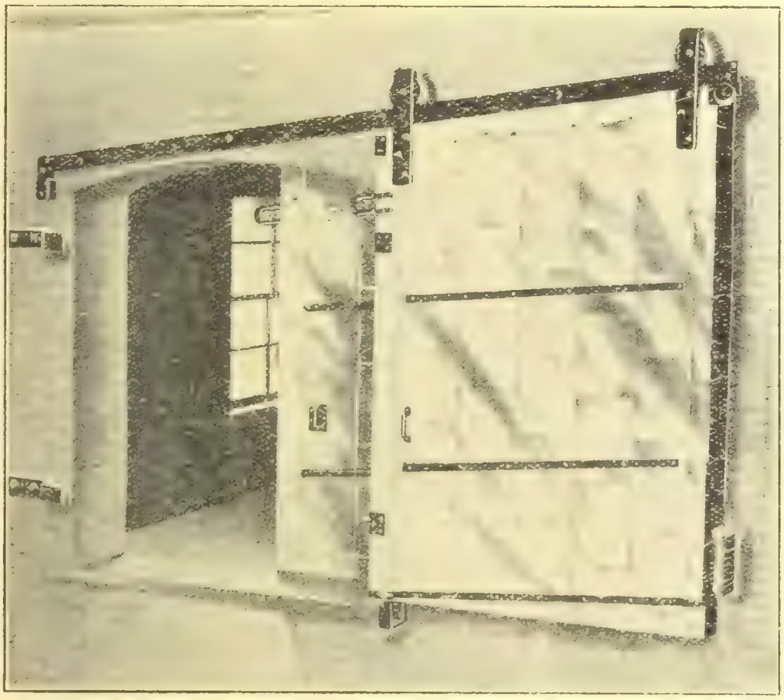
The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

Marsh & Henthorn, Limited - Belleville, Ont.

Sales Agents: MUSSENS LIMITED, Montreal



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB

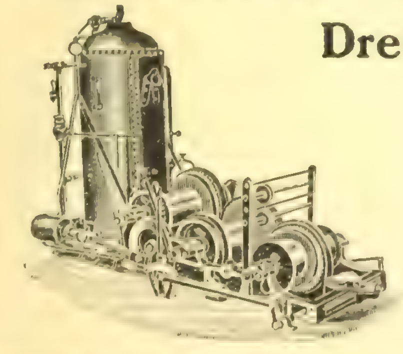
DOUGLAS BROS LIMITED

TORONTO, ONT. MONTREAL, P.Q.

DB

M. Beatty & Sons, Limited

Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Personal and General Notes

Mr. G. H. Bryson, assistant city engineer of Victoria, B.C., has resigned.

The Ontario Municipal Association will hold its annual meeting in Toronto on Tuesday and Wednesday, Sept. 6 and 7 next.

Agents of Mackenzie & Mann have taken an option on the large brick manufacturing works of Humber Bros., of Victoria, B.C.

A rich strike of asbestos ore has been made on a ranch two miles from Okanagan Falls, B.C. The find is one of vast importance to western industries.

D. H. McFadden, of Emerson, Man., has resigned as inspector of public buildings for Manitoba, and the Provincial Government has appointed Wm. Baker, of Winnipeg, as his successor.

The C.P.R. will spend about $150,000 on improvements in Kamloops this year. They propose moving their sheds and track to the river front, thus relieving the centre of the town of the annoyance.

J. A. Grant, of Grant Bros., railway contractors, Los Angeles, Cal., and Mrs. Grant, after spending some time in their native place in Glengarry county, Ont., sailed from New York, July 20, for a European tour.

Mr. James White, of Ottawa, formerly chief geographer of the Dominion, and now secretary of the Commission of Conservation, is making a trip through the West and British Columbia gathering data for a report on the water powers of the Dominion.

Western builders and contractors and supply men generally will do well to watch movements at Port Mann, B.C. Large building operations are promised in the near future, and as this place is spoken of as the terminus of the Canadian Northern, it will certainly be a town of considerable growth.

In a recent test of the Fernie, B.C., water supply, in the case of a big conflagration, City Engineer R. Potter reports a force of 88 pounds per square inch at the hydrant, which would last about 20 hours. After that they have sufficient supply to give a force of 66 pounds per square inch, indefinitely.

At a recent meeting of the Toronto City Council the by-law to amend the existing building by-laws of the city, to make it compulsory on builders to provide adequate protection for all employees engaged in erecting steel frames for buildings was given two readings and referred to the Legislation Committee.

Stonecutters on the Queen's Science Building, at Kingston, Ont., went on strike because the masons are cutting the coarser stone. They have been off for three weeks and building operations are delayed. Through strikes the contractor has lost two months' time this season. The dispute is between two sections of union men.

As the result of the strike of the bricklayers and stonemasons, the Montreal Builders' Exchange has decided to establish local unions affiliated with the Canadian Federation of Labor. A preliminary agreement has been signed between the officials of the two bodies, and it is the intention to have the new unions incorporated and to make an agreement between them and the Builders' Exchange.

Mayor Morley, or Victoria, is of the opinion that a combine exists among the merchants of that city in restraint of trade. Recently when tenders were called by the city for the supply of a large amount of material for corporation work there was but one tender submitted and this was signed by the half-dozen or more firms carrying the goods sought. In view of the facts the mayor said the council should consider the advisability of asking for outside bids when next calling for tenders for material.

The following members of the Toronto City Council and Guild of Civic Art have been nominated to act on the Civic Improvement Committee, which will supervise the preparation of a comprehensive plan for the improvement of the city. From the Guild of Civic Art: Sir William Meredith, Messrs. K. J. Dunstan, James Ryrie, R. J. Dilworth, J. M. Lyle, Edmund Burke, J. P. Hynes, W. A. Langton, Alexander Laird and James B. O'Brian. From the City Council: Mayor Geary, Controllers Ward, Spence and Church, Ald. Chisholm, O'Neill, Maguire, Welch, Graham, McCausland and Baird.

Current Railway News

Mr. Brown, Dominion Land Surveyor, left Regina last week to lay out five new townsites on the G.T.P. line between Regina and Griffin.

J. Gunn & Sons expect to proceed immediately with the construction of the Edmonton-Strathcona bridge. Mr. W. Gunn is now in the Twin Cities completing arrangements for the commencement of the work. The machinery has been shipped for some time but was held up at the provincial boundary awaiting certificates.

According to a Regina, Sask., dispatch, the Grand Trunk Pacific management is now only awaiting a settlement of its terminal matters with the Regina city council to let a contract for the construction of this line westward, and also to finish up the link from Regina southwards to its grade on the line to the boundary. Every effort is being put forth to rush construction on the line from Balcarres to Regina, but the contractor, Mr. McArthur, is badly handcapped owing to the difficulty of securing sufficient men and teams for the work.

The Transcontinental Railway from Levis to Moncton, N.B., will in all probability be open for traffic in the spring of next year. The completion of this section will put into operation one of the most important links of the whole line. Arrangements are already being made in a preliminary way for car ferries across the St. Lawrence pending the construction of the Quebec bridge. From Quebec to a point 195 miles west the line is about completed now, but from the latter point to Lake Superior Junction it will not be done for two years. On this interior section the work has been held back until supplies and a plant could be taken in from the other end by rail. The distance as well as the character of the country made it practically impossible to haul in a construction plant. The section from Lake Superior Junction to Winnipeg will be ready for operation this fall.

The contractors on the coal fields extension of the Grand Trunk Pacific have started to cut out the right of way from Edson. This branch, which is to be about 70 miles in length, will cross the Yellowhead Pass Coal Company's lien and the will cross the Yellowhead Pass Coal Company's line and the Pacific Coast Pass Coal Company's lines and unless labor difficulties, so troublesome in the West, are greater than anticipated, the grade should be ready before the winter closes in. On the Battleford branch of the Grand Trunk Pacific the contractors are seriously hampered by lack of labor, but track laying is expected to begin on the grade by the middle of next month. On the Prince Albert branch the same con-

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

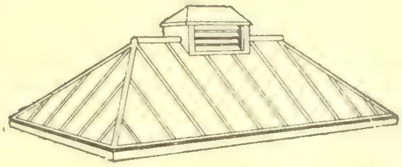
BATTS LIMITED
50 Pacific Avenue - - West Toronto

"A work ill done must be twice done—only the best gives satisfaction."

The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

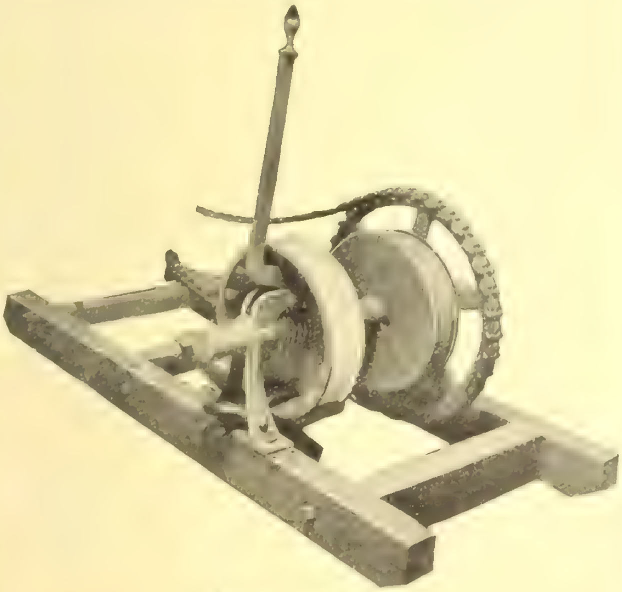
The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

ditions prevail, but it is likely that about 90 miles of the grade will be ready for steel before the winter. Ballasting cannot be continued after the frost sets in, so the work is being rushed with all possible speed. On the Regina portion good progress is being made between Melville and the southern limit, about 100 miles south of Regina. Farther than that there is nothing but tentative surveying. All the contracts have been let for the work from Melville to the southern limit, and it is intended to connect with the main line through Brandon.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

1285. Paints, varnishes, cement, etc.—A firm of general forwarding agents in New York City, with extensive connections in Buenos Ayres, are in the market for the above goods and will welcome correspondence from Canadian firms.

1300. Railway material—A Yorkshire firm of railway material manufacturers and iron founders wish to appoint a first class firm in Canada to act as their agents.

1301. Railway material—A Staffordshire firm manufacturing bolts, nuts and fencing, and all classes of railway material, wish to enter the Canadian market.

1306. Plaster and cement—A North of England firm manufacturing plaster and cement wish to extend their business connections in Canada.

1307. Valves for speed pumps, etc.—A London firm manufacturing patent valves for high and low speed pumps, air pumps, air compressors, blowing engines, etc., wish to get in touch with a firm in Canada open to take up the Canadian patent rights, or to manufacture the article on their behalf in the Dominion.

"Everything in Iron"—A Useful Work

We have received from the Canada Iron Corporation, Limited, Montreal, a comprehensive and well illustrated catalogue of their leading lines. This book, indeed, is something more than a catalogue. It is a work of art; moreover it has a real educational value. In an early chapter relating to the reduction of iron ore it is pointed out that in the earliest times the general use of iron was precluded by the difficulties encountered in its manufacture. It was as a prize that Achilles offered at the games in honor of his lamented friend, Patroclus,—

"A mass of iron, an enormous round,
Whose weight and size the circling Greeks admire,
Rude from the furnace and but shaped by fire."

During the last half century enormous strides have been made in the reduction of iron ore and if the ancient Greeks were to visit the present-day blast furnaces of the Canada Iron Corporation they might be stimulated to further admiration. The various processes of manufacture described and illustrated in this work are of particular interest.

The historical data contained in the introduction to the section relating to cast iron pipe are worthy of note. From the information given it appears that the Greeks used clay and lead pipe for distribution purposes as early as 600 B.C., and many centuries later bored logs were used for the same purpose, but it was not until the 14th or 15th century that castings of iron began to come into general use. Cast iron pipe was first heard of in the 17th century. There are cast iron mains in use to-day which were laid more than 200 years ago. The cast iron pipe leading to the fountains at Versailles are said to have been laid in 1685, and the first cast iron pipe for water purposes in London were put down in 1800. In Philadelphia the first iron pipe were used about 1804. In these and other places pipe have been laid bare after the lapse of a century and found to be in perfect condition. Cast iron is therefore now accepted as the standard material for gas and water underground mains.

The Canada Iron Corporation, Limited, are the first on this continent to make the process of casting pipe vertically a continuous operation. At the Fort William plant there are two long parallel pipe pits joined by transfer cars, and the pipe flask carriages are moved through them by an endless chain. The ovens are built over the end of one pit and fired from below. The pipe flasks, having been rammed in the other pit, are carried across by the transfer cars and onward slowly through the ovens. The hot metal is poured into them as they emerge, and by the time they complete half of the circuit the freshly made pipe are ready to be stripped. Ramming starts over again, and so the operation continues year in and year out by different shifts of men without interruption or cessation of work. In the Fort William plant all sizes of cast iron pipe are manufactured at the rate of 80 to 120 tons every 24 hours.

At the annual convention of the Canadian Society of Civil Engineers held at Ottawa last January, a committee was appointed to consider standard specifications for cast iron pipe and special castings. The Canada Iron Corporation, Limited, have adopted the standard specifications of the American Waterworks Association. These are reproduced in full in the work under review and provide a handy reference for engineers and contractors.

Diesel Engine Has Many Good Points

In the Contracts Department of this issue appears a notice to the effect that the Canadian Boving Company, Limited, have received an order for 200 B.h.p. Diesel engines for the Moose Jaw Street Raiway. These engines are manufactured by Mirrlees, Bickerton & Day, Limited, of Stockport, England, and are the first of the kind to be installed in Canada. The Diesel represents the highest possible quality in this line of work. All parts which do not come within a limit gauge of 1/3000-inch are rejected, everything thus being absolutely interchangeable. The Diesel engine is claimed to be the most economical form of motive power in existence and will generate current at about one-half to one-third the cost at which it can be obtained from steam plant. Its use dispenses entirely with boilers, boiler setting, boiler flues and chimney shaft, boiler house buildings, boiler feed pumps, feed water heaters, mechanical stokers, all steam and water piping, and coal and ash handling gear. The complete power equipment is contained in one building of moderate dimensions and each unit is self contained and independent. The cheapest oil can be used with the Diesel without any alteration whatever as far as actual running is concerned. "Fuel" oil can be obtained in bulk in Toronto for 3 cents a gallon and should not cost more than 4 to 5 cents a gallon, delivered, if bought in car lots. From what we can learn of the Diesel we think it an advantageous and economical proposition. Diesel engines are not an experiment. Engines built more than 14 years ago are running to-day in regular service.

The "Surveyor" states that the Ogmore Council, England, has received the following claim: "I beg to send my claim to you. You know very well what for. When I owe you money, you are sending very sharp letters to me. Understand it is my turn now. You know alright that you have put a manhole and a long string of pipes in my garden. A bominabul stink from that there manhole, and you think I've no claime agin you. You pay up, and very quick. Now I want £15, 'cos I am going on my holidays. I know I owe you £3. You take it out, and send me £13, and I will be off next week."

Harry Allen Jacobs. Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Port Credit Brick

Is the leading building material of to-day because of the strength, color and quality. We make the following:

Repressed Wire Cut Brick
Common Wire Cut Brick
Pressed Brick
Paving Brick
Our prices will interest you.

Port Credit Brick Co.

Limited

Home Bank Building - Toronto, Ont.

Works: Port Credit, Ont.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Sand & Supplies

LIMITED

Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite Crushed Stone and Sewer Pipe

M. 4507

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.

Railway shipping facilities of the best.

Canadian Pressed Brick Co.

Limited

Phone 423 and 2457

HEAD OFFICE:

Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

Largest Manufacturers of
Glazed Earthenware
in the world.

Sewer Pipe

Single and Double Strength. Sizes 3" to 42"

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

J. H. NEW
President

RYLAND H. NEW
Vice-President

BEWARE

that you are not caught in the trap set by unscrupulous imitators. Manufacturers of inferior sewer pipe who claim their product to be "just as good as"

Hamilton Vitrified Salt Glazed Sewer Pipe

Results are what is wanted. Why buy something that has proven an entire failure just because it is cheap and the manufacturer says it will do the work. Make him prove it. We are willing to prove our statements.

The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or Write us

Hamilton and Toronto

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Offices:
Nos. 346 and 348 Broadway, NEW YORK CITY U.S.A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont. London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis,

(Taylor & Gordon)

Architects

North British & Mercantile Chambers,
80 St. Francois Xavier St., Montreal
Telephone Main 281

BANK
OFFICE
SCHOOL
CHURCH
OPERA
LODGE
& FURNITURE
MANUFACTURED BY
CANADIAN OFFICE-SCHOOL FURNITURE CO. LTD.
PRESTON - - - - - ONTARIO

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

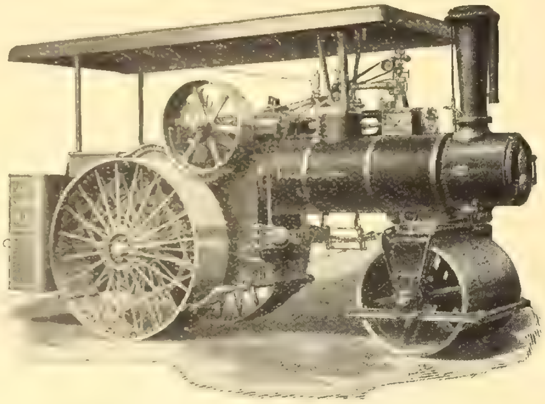
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

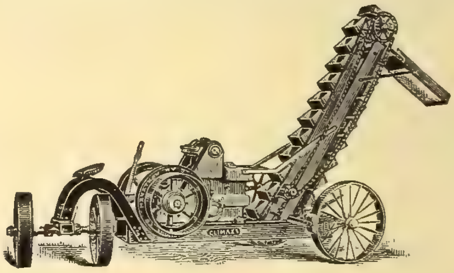
Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER-

All sizes ready for shipment.

Catalogues furnished on application.

**The
Climax Road Machine Co.
Hamilton, Ont.**

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

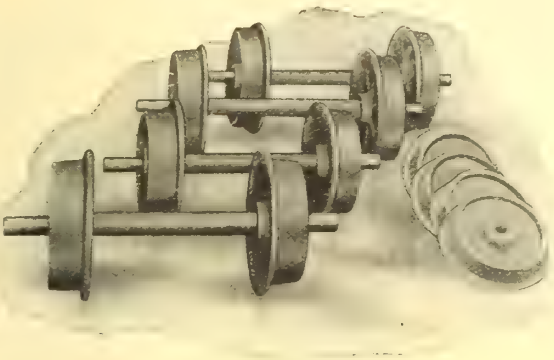
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N.S.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA aud H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry,

Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole
Frames,
Crossing
Plates,
Special
Castings.

YOUR CARD

if placed on these pages would be among those of other men of high-standing.

We would be pleased to quote you rates.

Reid & Brown

Roof Trusses and Girders

Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,

Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St. Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.......	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

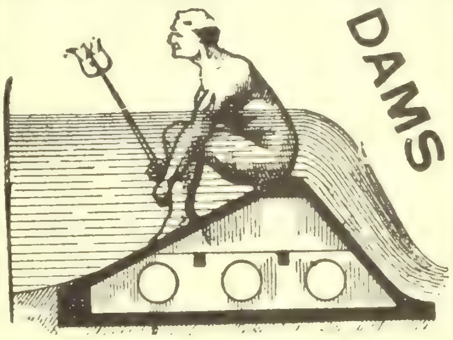
(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The B. C. Gazette gives notice of the incorporation of the following companies: Laney Bros., Limited, capital $5,000, incorporated as builders, contractors, plumbers, etc.; Columbia Valley, Irrigation & Power Company, Limited, capital $500,000; Hallman & Peniston Machinery Company, Limited, capital $100,000; Worswick Paving Company, Limited, capital $250,000; Consolidated Buildings, Limited, capital $500,000.

The construction of permanent sidewalks in Montreal during this summer has run into over half a million dollars as against the few thousand which have been expended on wooden walks. About 25,000 square yards of asphalt, and 30,000 square yards of cement are being laid in various parts of Montreal this season. During the whole of last year the entire expenditure on sidewalks amounted to about $25,000, while this year the $499,880 apreciated for this this purpose last June has been used up and an additional $100,000 has been set aside.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

German Alsen,

at **higher prices** than competitors, has again this year been awarded the **most important contracts** of the World, because practical tests by leading Engineers proved its merit and **relative economy.**

Note the following:

	1905-1906
Mexico City	**120,000 bbls.**
Necaxa Dam (shipping instructions so far 60,000 bbls.) approximate amount	**175,000 bbls.**
Xochimilco Water Works. Mex. approx.	**200,000 bbls.**

	1905-1909
U.S. Philippine Govmt.	**40,000 bbls.**
Govmt. Order South America	**150,000 bbls.**
Rio de Janeiro, Satos, etc.	**40,000 bbls.**

Also enormous quantites for the Pacific Coast, Australia, England, South Africa, &c.

There is always a certain trade who WILL PAY for THE BEST We also American Alsen, the highest grade of domestic Portland Cement.

Cement 45 BROADWAY - NEW YORK CITY **Cement**

We protect our customers! - See page 155 in "Sweets" for full particulars.

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co.
Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

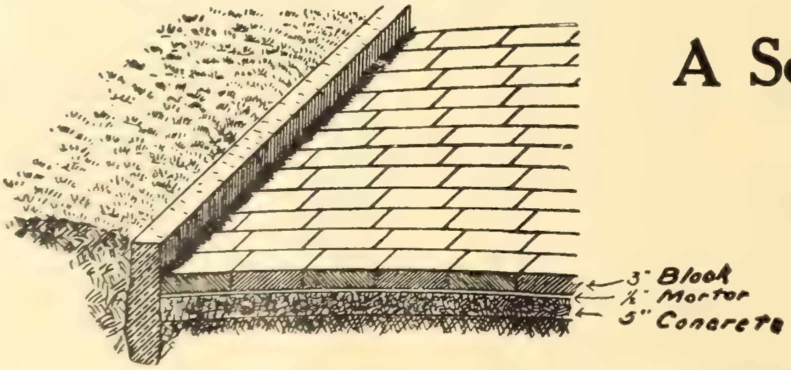
The Last Word in Wire Lathing

1910 **Patented Trussed** 1910

Wire Lath

FOR DESCRIPTION AND PRICES
APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

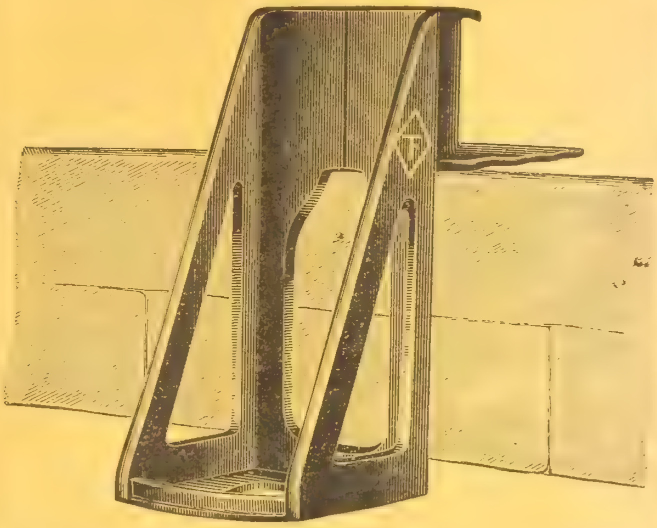
HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only Manufacturers in Canada of This Line

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR **S** BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

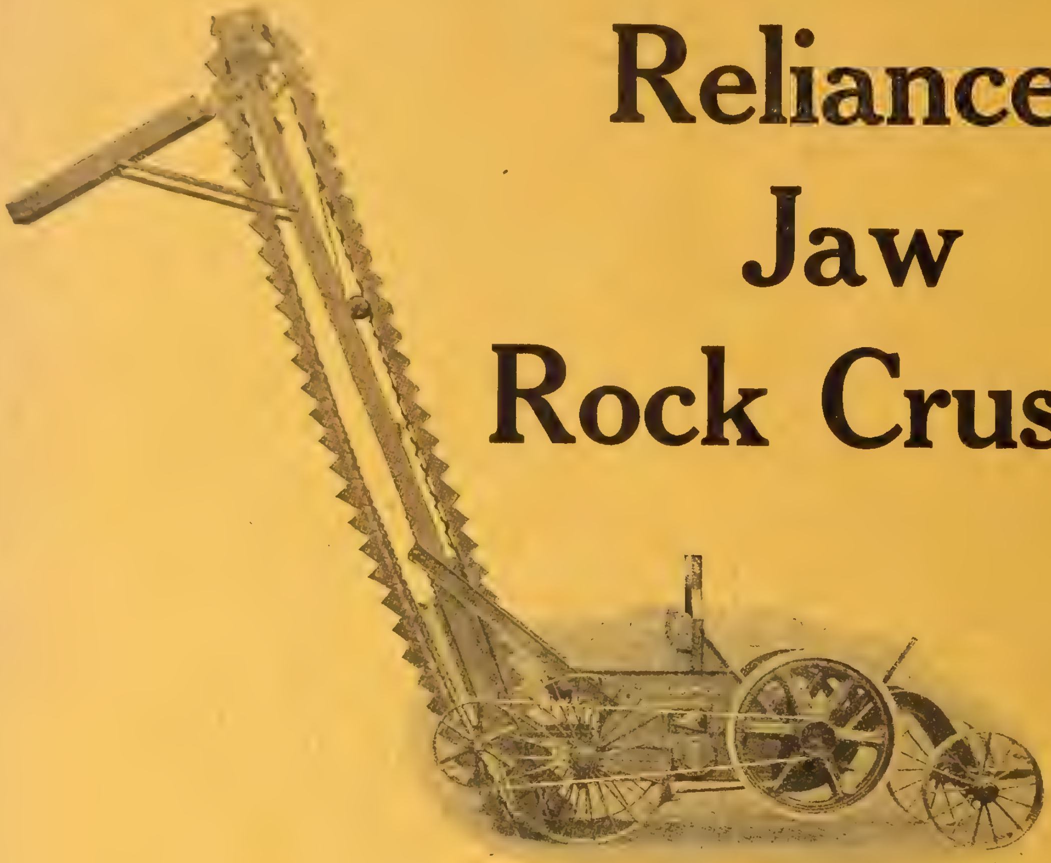
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: · ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



Reliance Jaw Rock Crushers

All Sizes

Prompt Shipment

This crusher embodies the simplest and most powerful mechanism possible for producing the movement necessary for crushing rock.

All principal parts made of steel. The frame is a single casting of open hearth steel. The crusher can be quickly and easily adjusted to vary the size of product. All bolts are provided with lock nuts, every journal is fitted with replaceable bearings so that the slow and expensive process of rebabbitting is eliminated.

These are only a few of the good points of the "Reliance."

Let us submit you full particulars and prices.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, August 31, 1910 No. 35

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps, Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE

The **Smart-Turner Machine Company** Limited
HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

"Queen's Head"

Every Sheet Guaranteed to be ABSOLUTELY "DEAD FLAT"

CANADA

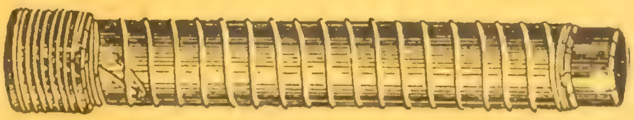
Galvanized Iron

Flatness

MEANS LESS LABOR AND BETTER WORK

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

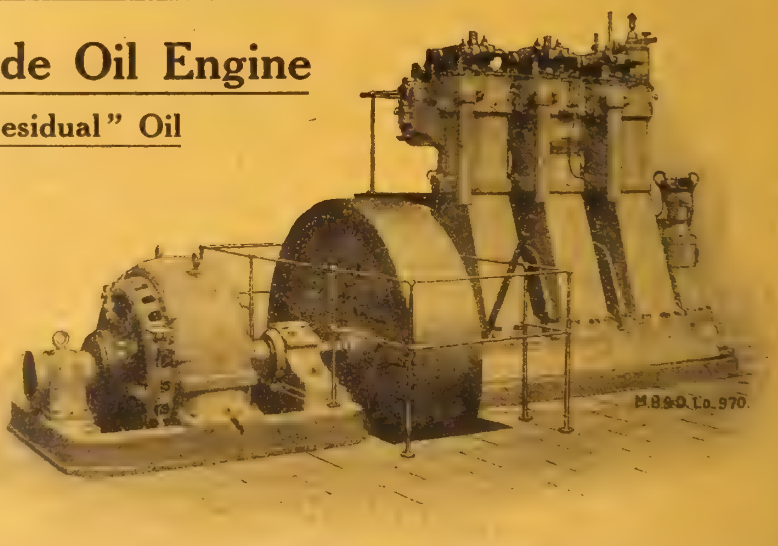
3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil



No Ignition Gear
No Producer
No Chimney

No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdown
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work

	Page
Canada Wire Goods Mfg. Co	15
Dennis Wire & Iron Works	10

Boilers

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	53
McDougall Caledonian Iron Works	31
Mussens Limited	32
Taylor-Forbes Co	
Waterous Engine Works Co.	54

Brick

American Enamelled Brick Co.	
Canadian Pressed Brick Co.	55
Don Valley Brick Works	7
Hamilton Pressed Brick Co.	10
Milton Pressed Brick Co	54
Port Credit Pressed Brick Co.	55
Toronto Pressed Brick Co.	34

Bridges (Steel)

Canadian Bridge Co.	18
Cleveland Bridge Co.	18
Dickson Bridge Works	
Dominion Bridge Co.	18
Phoenix Bridge and Iron Works	19
Pennsylvania Steel Co.	18

Builders' Hardware

Taylor-Forbes Co.	

Cement

Alsen Portland Cement Co.	62
Britnell & Co	16
Bremner, Alex	59
Canada Cement Co	3
McNally & Co., W.	55
Morrison & Co., T. A.	60
Rogers, Alfred	4
Rogers Supply Co.	31
Sand and Supplies	55

Conduits

	Page
Conduits Co., Limited	16

Concrete Mixers and Machinery

Canada Foundry Co.	14
Cropp Concrete Machinery Co.	6
Goold, Shapley & Muir	9
Hopkins & Co., F., H.	64
Jenckes Machine Co.	2
London Concrete Machinery Co.	21
Mussens Limited	32
Morrison & Co., T. A.	60
Rogers Supply Co.	31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co.	61
Buffalo Steel Co.	
Canada Wire Goods Mfg. Co.	15
Hamilton Iron & Steel Co.	34
Trussed Concrete Steel Co.	63

Contractors' Plant

Beatty & Sons, M.	15
Hepburn, John T.	17
H. & E. Lifting Jack Co.	19
Hopkins & Co., F. H.	64
Katie Foundry Co.	60
Marsh & Henthorn	53
Mussens Limited	32

Crushers (Stone and Rock)

Hopkins & Co., F. H.	64
Jenckes Machine Co.	2
Mussens Limited	32
Morrison & Co., T. A.	60

Corrugated Iron

Galt Art Metal Co.	20
Metallic Roofing Co.	53
Metal Shingle and Siding Co.	
Ormsby, A. B., Limited	5
Roofers Supply Co.	59

Contractors

	Page
McIlwraith, Jas. A.	60

Drills

Beatty & Sons, M	15
Canadian Rand Co.	1

Deafening Felts

Cabot, Samuel, Inc.	55

Drilling Contractors

Harvey, J.	61

Dredges

Beatty & Sons, M	15

Engines

Canadian Boving Co.	2
Inglis, John	22
Jenckes Machine Co.	2
Mussens Limited	32
Waterous Engine Works Co.	54

Excavators

Harris, J. W.	11

Electrical Apparatus and Supplies

Northern Electric & Mfg. Co.	

Engineers (Civil and Mechanical

Barber & Young	60
Chipman & Power	60
Bowman & Connor	60
Davis & Johnston	60
Farmer, John T.	60
Fuce, Edw. O.	60
Galt Engineering Co., John	60
Glaubitz, H. J.	60
Hunt & Co., Robt. W.	55
Inglis, John	22
Lea & Ferguson	60
Mace, T. Harry	60
Mitchell, C. H.	60
McRae, John B.	60
Moore & Scollan	60
Nadel & Adler	60

Fire Apparatus

	Page
Morrison & Co., T. A.	60
Seagrave, W. E.	16

Fireproof Doors and Windows

Douglas Bros	5
Mussens Limited	32
Ormsby, A. B.	5

Granite and Marble

Laurentian Granite Co.	60
Missisquoi Marble Co.	13
Rogers Supply Co.	31
Smith Marble & Construction Co.	54

Glass

Chance Brothers & Co.	
Consolidated Plate Glass Co.	
Luxfer Prism Co.	
Thompson & Co., B. & S. H.	
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E.	
Taylor-Forbes Co.	

Hoisting Machinery

Beatty & Sons, M.	15
Inglis, John	22
Jenckes Machine Co.	2
Hopkins & Co., F. H.	64
Marsh & Henthorn	53
Mussens Limited	32
Scott Machine Co.	53

Hydrants

Canada Iron Corporation	59
Gartshore-Thompson Pipe Co.	58
Kerr Engine Co.	8

Lime

Christie, Henderson & Co.	17
Jamieson Lime Co.	19

(Continued on page 6.)

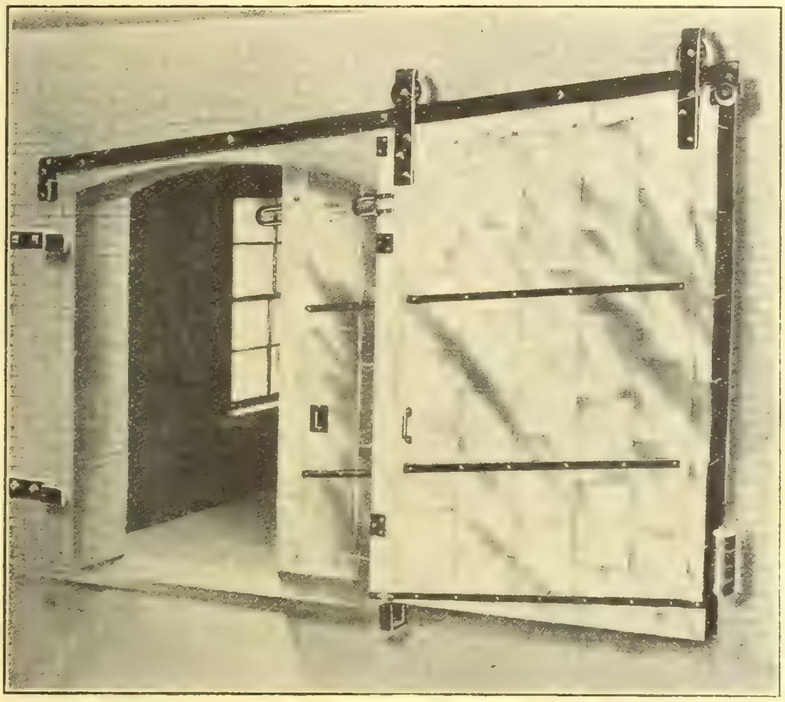
Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

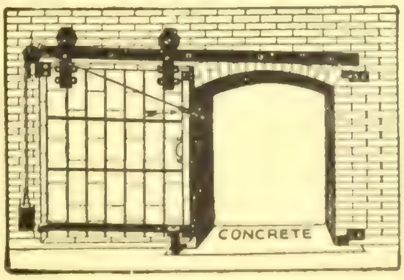
DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

Have You Got The Mistaken Notion?

that all **Fireproof Doors** mean the same Insurance allowance. They don't. **A Labelled Fireproof Door** is the only door that means 100% of the allotted allowance. **Unlabelled Fireproof Doors** mean but a partial allowance. **A Labelled Door** is a door that has on it the **Underwriters** stamp, proving it has been inspected and is made right.

Our doors **all bear this label.** Let us quote you.

A. B. ORMSBY, Limited
Experts in Fireproof windows and Doors
Factories - Toronto and Winnipeg



"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for Macadam in Ontario.

Offices and Quarries : HAGERSVILLE, ONT.

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	10
Brodie Lumber Co	20
Delaplante, Ltd	31
Eaton & Sons, J. R.	63
Georgian Bay Shook Mills	
Rhodes Curry & Co	
Sanitary Floor Co.	62
Siemon Bros.	53
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	20
Metallic Roofing Co.	53
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co	15

Paving and Paving Materials

Dominion Carbolineum Works	12
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	
Britnell & Co	16

Pipe

Canadian Pipe Co.	58
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	58
Municipal Construction Co.	17
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co.	
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery

Beatty & Sons, M.	51
Goulds Pump Co.	
Hopkins & Co., F. H.	64
Inglis Co , John	22
Martin Steam Pump Co.	63
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	57
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	54

Roofing Materials

Barrett Mfg. Co.	
Brantford Roofing Co	11
Galt Art Metal Co.	20
Metallic Roofing Co.	53
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies

Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	14
Case Threshing Machine Co.	58
Climax Road Machine Co.	58
Morrison & Co., T. A.	60
Mussens Limited.	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	16
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co.	10
Rogers Supply Co.	31
Standard Drain Pipe Co.	56

Sand

Rogers Supply Co.	31
Sand & Supplies	55

Stone

	Page
Britnell & Co.	16
Christie, Henderson & Co.	17
Consolidated Stone Co.	20
Contractors' Supply Co.	59
Corinthian Stone Co.	15
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	55
Wiarton Stone Quarry	61

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	18
Hamilton Iron & Steel Co.	34
MacKinnon Holmes & Co.	19
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H.	19

Shovels (Steam)

Beatty & Sons, M.	15
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Safes and Vaults

Taylor, J & J	

Stone Cutters

Bailey-Underwood Co.	52

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	54

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	53
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	19

Typewriters

United Typewriter Co.	62

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	8
Standard Fitting & Valve Co	63

Ventilating System

Gardiner & Gaskill	57

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	12

Wire Guards and Screens

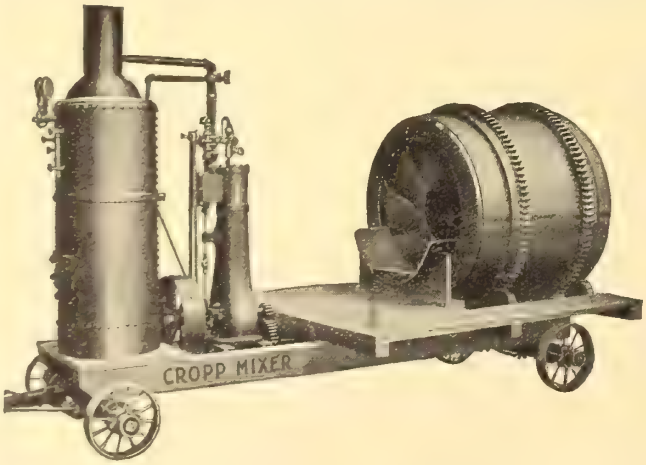
Canada Wire Goods Mfg. Co.	15

Water Wheels

Canadian Boving Co.	2

The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co.,
84 Lasalle Street,
Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo.
MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

The Goods with a Record

Don

Bricks

- Pressed Bricks
- Enamelled Bricks
- Vitrified Bricks
- Porous Terra Cotta Bricks
- Wire-Cut Bricks

Fireproofing

- Arches
- Blocks
- Column Covering
- Furring

Don Valley products have been the leading building material for many years. Their value is known.

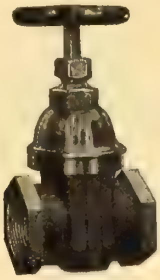
Don

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

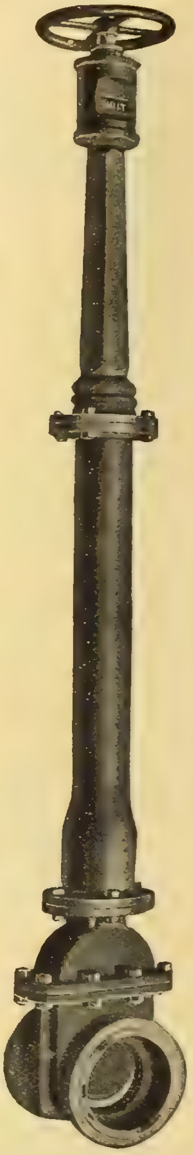
Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Water Crane and Hydrant Combination



Webber Gate (Brass)

Hub End Gate



Indicator Post for Fire Protection Valve

K E R R

Our policy of careful manufacture for severe duty is maintained throughout our whole establishment and as a result our products are of the highest quality.

Every "Kerr" valve is accurately made and finished. They are perfectly tight when closed and have full area when open.

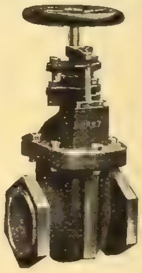
We have a complete catalogue

Have you a copy of it?

IRON

BODY

GATE



VALVES

Compression Hydrant

VALVES

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

See it at the Toronto Exhibition

However difficult it might be to decide which was the **second best**

Double Wire Wound

Wood Stave Pipe

For Water Works Systems

everyone knows the **first best** is made by

The Dominion Wood Pipe Co.

A postal brings a catalogue **New Westminster, B. C.** Limited

---

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

Henry New | Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**

"Mimico" Brand Sewer Pipe

Are always right.

Big stock of all sizes from 4 in. to 24 in. always on hand.

Inquiries solicited.

Orders filled promptly and carefully.

Come and look things over when visiting the **FAIR.**

Telephone Park. 422

THE ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Toronto Officials Recognize the Fire-Resistant Qualities of

Brantford Roofing

Along with slate and iron, Brantford Roofing is accepted by the City Architect and Chief of the Fire Department for use in the most congested district in Toronto. We have a certificate to that effect. Do you know of any other ready roofing that has such a certificate? We think not.

The Toronto officials recognize a REAL fire-resistant roofing when they find one. So do the fire-insurance companies. They give lower rates for buildings covered with Brantford Roofing.

These facts are worthy of a builder's or contractor's most careful consideration when selecting or specifying roofing material for his contracts.

Send for interesting Roofing Book and Samples.

Brantford Roofing Company, Limited

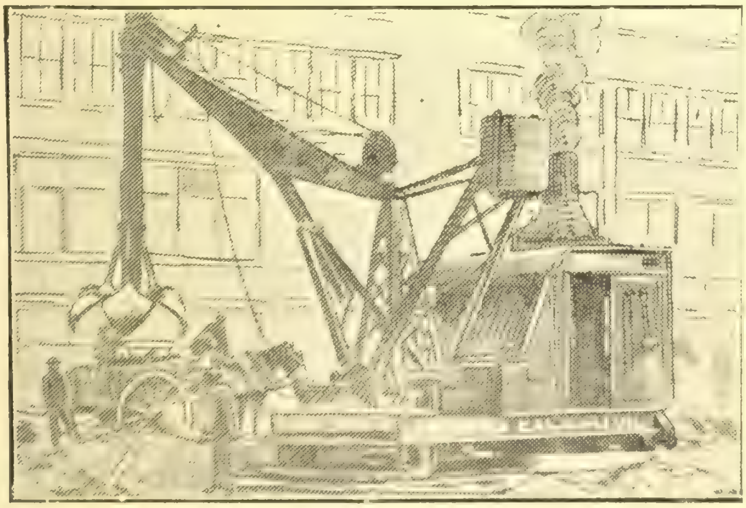
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

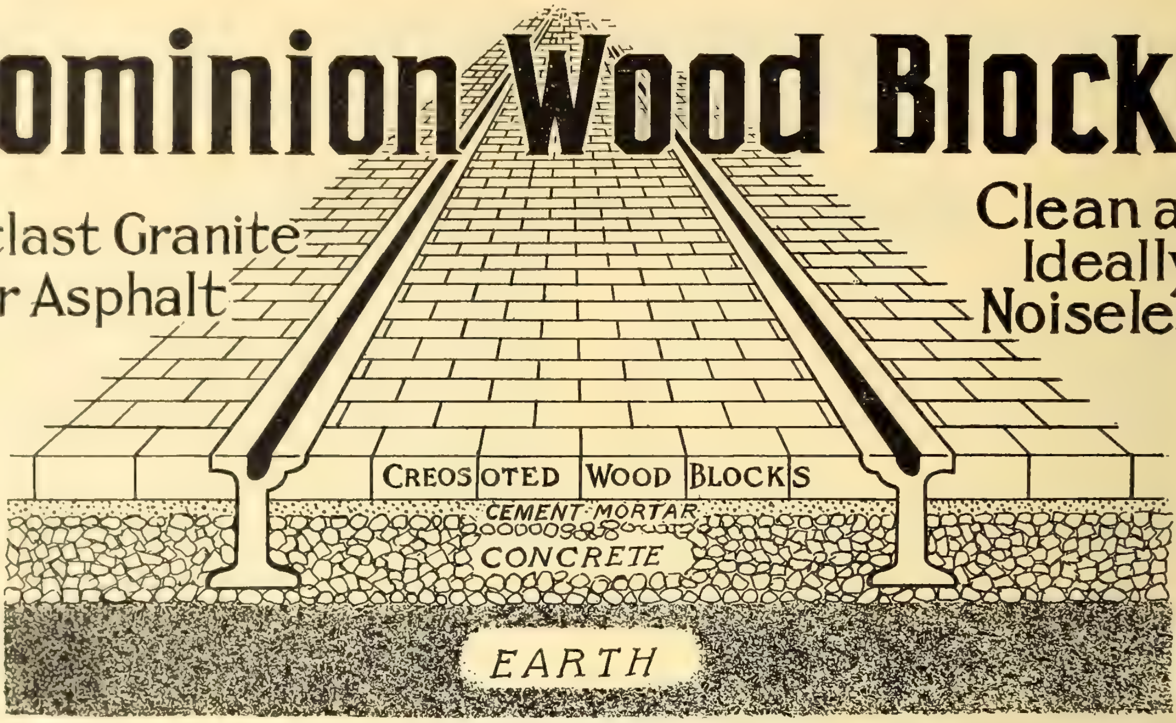
J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Reasons Why

YOU should use Dominion Creosoted Wood Blocks for your city's or town's paving.

These blocks make a pavement that is not only cleaner, quieter and more sanitary than asphalt but is cheaper.

Dominion Wood Blocks are made in a mill specially designed for their particular manufacture. They are made from live Douglas Fir logs, the best material known for the purpose and our creosote is purchased under rigid specification.

A better pavement than Dominion Wood Blocks cannot be made.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

What More Do You Want?

than a high-grade marble with all the richness of color and lasting qualities of the imported product.

Quarried right here in our Dominion.

Missisquoi Marble

has been used as a building and finishing material for the past forty years. There is ample proof that its color is permanent and its strength everlasting

With our new equipment we can fill the largest order that can be transported.

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
Bosse & Banks, Quebec
Jas Robertson & Co., St. John, N. B.

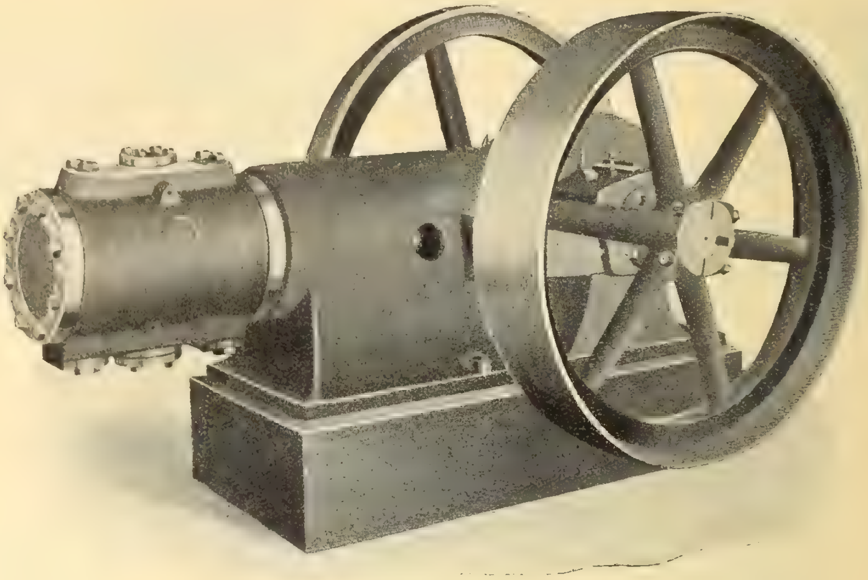
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver
General Contractors' Supply Co., Halifax
Also Branch Office, 85 Sparks St., Ottawa, Ont.

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



Canada Foundry Company, Limited

Head Office, TORONTO

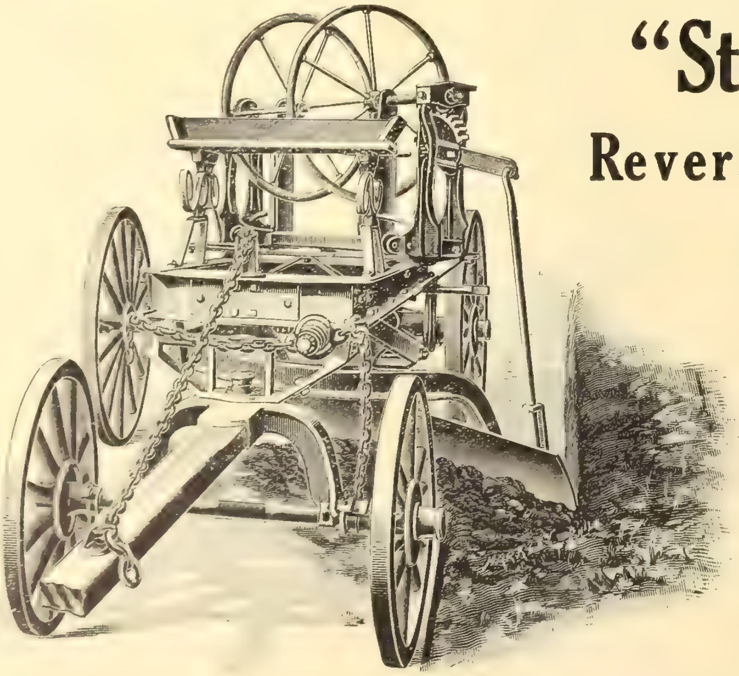
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors machinery

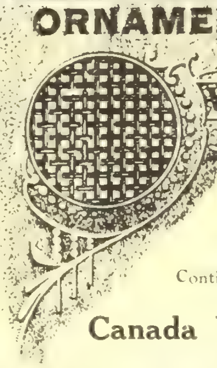
Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our prices on our

CONCRETE REINFORCEMENT

Continuous lengths or in sheets cut to size

WINDOW GUARDS

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

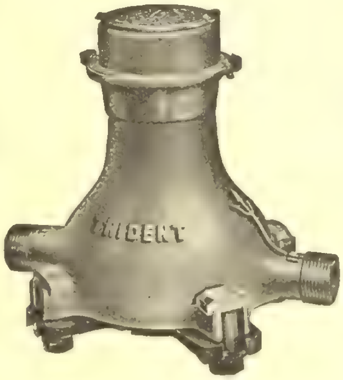
Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low Quality is High

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT
Frost-Proof
Water
Meters

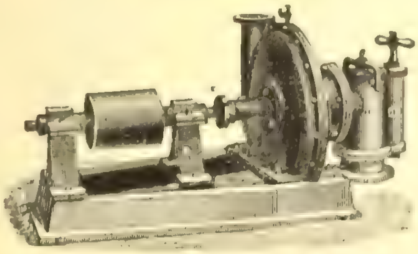
Write for Catalogue

Main Office - 90 West Street

New York City

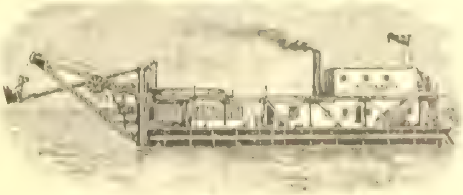
M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



"Galvaduct" and "Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

EVERYTHING FOR THE BUILDER

SAND AND GRAVEL
SCREENED, PIT RUN AND PEA GRAVEL
BUILDING SAND

We can also ship promptly
Building and Crushed Stone
Lime, Cement, Fire Clay,
Plaster, Fire Brick
Hair, Sewer Pipe, Weeping Tile

Let us figure with you

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North { 2107 658

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

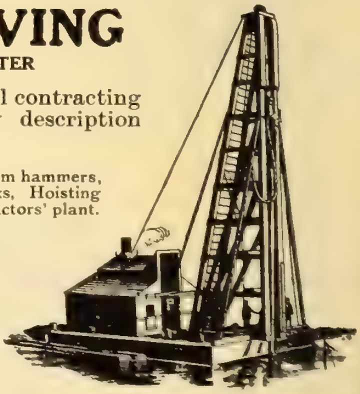
PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.

The Municipal Construction Co.

Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

Our Derricks are used by the leading Contractors in all parts of the Dominion

¶ They are made in standard sizes from ¾-ton upwards, have single and double purchase gears, band brake, and an ample length of first-quality wire rope. :: :: ::

¶ From first to last they are made from the finest materials, by our own workmen, and in our own shops. :: :: ::

¶ They may be operated either by hand or power, and effect a labour-saving of fully fifty per cent. over the old-style derrick. ::

See our Exhibit, just east of Machinery Hall, Canadian National Exhibition, Toronto, Aug. 27th - Sept. 12th or write for full particulars. ::

JOHN T. HEPBURN
18-40 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—
New York N.Y. - 71 Broadway
Baltimore, Md. - - Continental Trust Bldg
Boston, Mass. - - - 70 Kilby Street
Chicago, Ill. - - Western Union Building
Mexico City, Mex. - Edificio de "La Mutua"
Philadelphia, Pa. - - Morris Building
San Francisco, Cal. - - 1505 Chronicle Building
St. Louis, Mo. - - Commonwealth Trust Building
London, England - - 110 Cannon Street
Steelton, Penna. - - At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers, Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

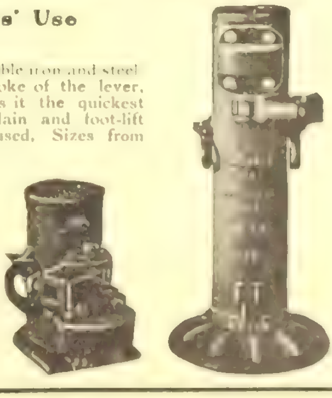
Made by practical Jack Builders. Material: best grades of malleable iron and steel Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal



"Lead and Steel Die Process"

"GALT"

Embossed Steel Ceilings

Artistically and practically a little ahead of anything else in this line being made in Canada.

The clean, sharp embossing that distinguishes "Galt" Ceilings and Walls is produced between a **Lead** and **Steel Die**, therefore—always uniform in depth, bold and clear-cut in appearance and free from cracks.

Machine-Cut Beads—another patented improvement. They make erection easier, 25% cheaper and a perfect job surer.

In art-work and mechanical production "Galt" Ceilings represent the latest developments in metal ceilings. Why be satisfied with old-fashioned stuff when the modern is here and costs less? Get our estimates on your work.

The Galt Art Metal Co., Limited
Galt, Ont.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

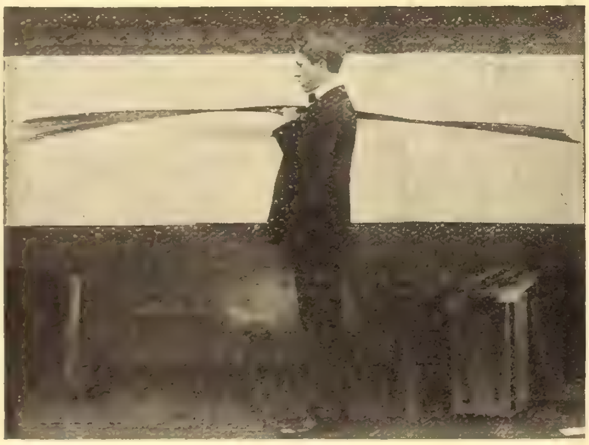
The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange



Think about this picture

This man is holding an ordinary sheet of twenty-seven gauge

Herringbone Lath

It is so stiff our competitors will tell you it's too stiff, and won't work easily around cornices. It's only stiff across the ribs though. If the ribs run crosswise on the sheet it would hang down like ordinary metal lath. You only bend your sheet one way in cornice work.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.

Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

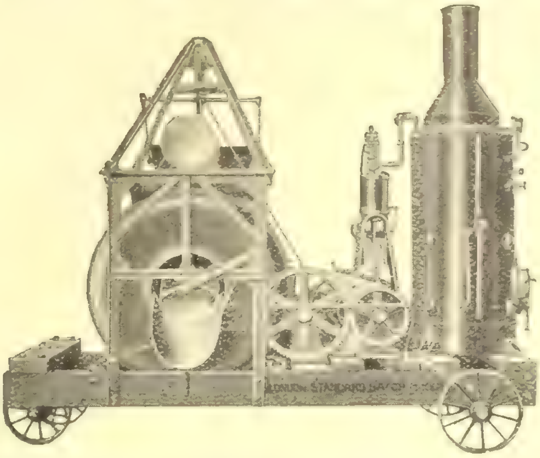
This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada



LONDON STANDARD DRUM BATCH CONCRETE MIXER

Meet us at Toronto Exhibition, we will have the largest exhibit of Concrete Machinery ever shown (on the Ground south-east of Machinery Hall.)

We ALSO MANUFACTURE the now famous LONDON AUTOMATIC BATCH MIXERS Nos. 1 and 2, also Face-down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machine, Hand Drain Tile Machine, Sill and Lintel Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada **Limited**

Manitoba Branch :
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada.

Sash
Veneered Hardwood Doors
Pine Doors
Frames

Ceilings
Mouldings
Stairs
Pine and Hemlock

"Empire Brand"

Hardwood Flooring

We make a specialty of mixed cars of the above contractors' supplies which are made for those demanding perfectly manufactured goods.

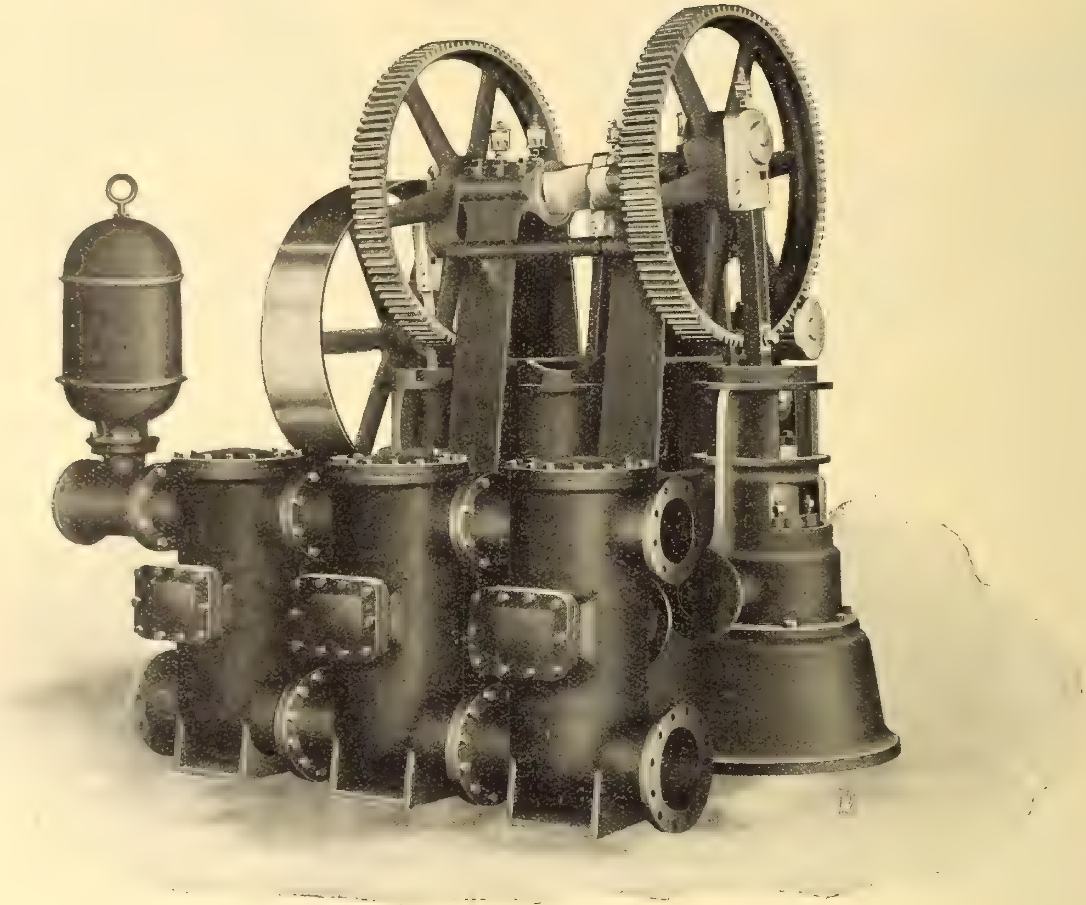
Best facilities for prompt shipment.

J. R. Eaton & Sons

Orillia, Ontario

Montreal Agent: C. A. SPENCER, 55 St. Francois Xavier St.

PUMPS



10 x 12 Single Acting Triplex Plunger Pump

We manufacture Pumping Engines of all types, Direct Acting Pumps, Geared and Centrifugal Pumps, also Special Machinery of all kinds.

Our Pumping Engines are in operation from coast to coast and are giving splendid satisfaction. We will be glad to refer prospective purchasers to any user of our pumps.

Photos, Prices and Specifications upon request

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Arnprior, Ont.

The road commissioner, Mr. D. Carmichael, has asked for tenders for the building of a road, and the erection of a fence on lots 21 and 20 in the 20th and 23rd concessions of McNab Townships.

Berlin, Ont.

The by-law to spend $8,300 in improving the sewerage system was carried.

Chippawa, Ont.

A by-law to provide for a waterworks system will probably be submitted to the ratepayers shortly.

Edmundston, N.B.

Tenders addressed to M. D. Cormier, town clerk, will be received until September 8th for the following: Supply and erection of stand pipe and accessories, construction of concrete foundation, etc., in connection with the installation of waterworks here. V. H. Dupont, engineer, 62 St. James street. L. A. Dugal, mayor.

Fernie, B.C.

A by-law was passed to borrow $27,000 for sewer extensions and $4,500 for the purpose of installing a fire alarm system.

Hull, Que.

The residents of Wrightville, a suburb of this city, have petitioned the council for a sewerage system and for the installation of larger water mains. The laying of cement walks has been recommended by the Streets and Roads Committee.

Montreal, Que.

The building of a boulevard from Ste. Catherine road to the road running parallel to the Riviere des Prairies and to continue eastward from Bordeaux through Ahuntsic, Cartierville and Sault au Recollet, entering the city at Maisonneuve, was the scheme favored by the majority of the representatives at the first regular meeting of the Metropolitan Park Commission.

North Bay, Ont.

The Tp. of Widdifield passed a by-law to raise the sum of $33,000 for the purpose of opening, improving, grading and gravelling streets, also for construction of waterworks.

North Buxton, Ont.

Tenders are being called until September 8th for new pump house, wheel, boiler and engine, etc., to be erected in the Pike Drainage Scheme, Raleigh Township, work to be completed this fall. Plans, etc., at office of A. E. Robinson, S. Buxton. T. R. Clarke, North Buxton.

Nanaimo, B.C.

It has been decided to construct some five miles of cement sidewalks in addition to those already under way, making in all some twelve miles of permanent walks which will be constructed during the next three months.

New Westminster, B.C.

At the Burnaby Board of Trade meeting recently the question of building many miles of sidewalk was discussed. Although plans are as yet in a tentative state, it is likely that the work will be undertaken in the near future.

North Vancouver, B.C.

Tenders are being received for the laying of an eight-inch water main from the present intake, North Lonsdale, in D. L. block 880, to Mosquito Creek, in D. L. block 1345, a distance of about 2,100 feet.

Penticton, B.C.

The ratepayers have sanctioned the purchase of the irrigation system from the Penticton Water Supply Company. The system will be purchased by a debenture issue of $100,000.

Prince Rupert, B.C.

The bids for street grading and 16-foot plank roadways were as follows: Neil Norman, close cutting and grading, $5,453.71, made up by rock excavation, $3.50, and earth $1.00; S. H. Watson & Company, building plank roadway, $1,236, close cutting and grading $4,103, rock $2.40, earth 70 cents; E. C. La Trace, plank road, $782.45, close cutting $120, rock $2.25, earth 90 cents; John Swanson, grading $2,311, rock $2.25, earth $1.00; S. B. McCordie & Co., roadway $1,239.46, grading and close cutting $4,213.20, rock $2.50, earth $1.20; W. H. Mitchell & Company, grading and close cutting, $3,912.60, rock $2.50, earth 60 cents; City Engineer, roadway $1,300, grading $4,000, rock $200, earth 60 cents.

Regina, Sask.

A by-law was passed to provide for the raising of $132,000 for pavements, and $28,000 for sidewalks.

Township of Norris.

Tenders will be received up to September 19th for the construction of municipal drains. A. MacEwan, clerk. For further particulars see "Tenders and For Sale Department" of this issue.

Vancouver, B.C.

City Engineer Clement has prepared an estimate for a trunk sewer on Glen drive from Eighth to Sixteenth avenues.

AWARDED.

High River, Alta.

McKibbon Bros., Calgary, received the contract for the construction of 3,000 sq. yards of cement sidewalk at 9 3-8 cents per square foot for sidewalks, 10¼ cents per square foot for crossings. Prices were as follows: 10 cents per square foot for all; 10 7-10 cents for walk, [illegible] cents for curb, 10 cents for walk, 12½ cents for crossings; 10 7-9 cents for walk, 22 cents lineal foot for curb.

The contract for 800 barrels of Portland cement was given to Kelly & Young, this place, at $3.20 per barrel, f.o.b. High River.

Estevan, Sask.

McKenzie & Prevost have been awarded the contract for the construction of the cement sidewalks on the principal streets. Prices in tenders varied between 17 and 35 cents per square foot. Amount of contract, $10,000. Engineer in charge, Mr. Gibson.

London, Ont.

C. Leathorne was awarded the contract for the storm water drain, at $749, side drains, 29 cents per foot. Other tenderers were: Thomas Martin, $987.80, side drains 40 cents per foot; B. Johnson, $850.00, side drains 40 cents per foot; W. J. Johnston & Company, $818.00, side drains 41 cents per foot.

Moose Jaw, Sask.

The contract for six miles wooden sidewalk was awarded to Contractor Ross, of this city, at 29 cents per lineal foot. Other prices submitted were: Messrs. Walker, 29½ cents; McLeod, 33½ cents, and Fenwick, 33 cents per lineal foot. J. M. Wilson, City Engineer.

Swift Current, Sask.

Laidlaw & McDonald, Fort William, Ont., have been awarded the contract for the construction of four miles of sewers and six miles of waterworks here.

St. Marys, Ont.

Leslie & McNeil, contractors, were given the contract for the laying of 4 miles of cement at 8½ cents per square foot.

Railroads, Bridges and Wharves

Belleville, Ont.

The Railway Commission has approved of the route of the C. N. R., located north of the highway from Trenton to a point east of Belleville cemetery, thence south of the highway to the city. This work will, it is stated, be commenced about September 1st.

Calgary, Alta.

See "Power Plants."

Dipper Harbor, N.B.

Tenders are being called by the Department of Public Works until September 25 for construction of extension to breakwater here. R. C. Desrochers, secretary.

Estevan, Sask.

It is announced officially that the C.P.R. will build the westerly extension of 20 miles from here, commencing August 29.

Kenora, Ont.

Messrs. J. T. Arundel, general superintendent of C. P. R., and J. Brownlee, superintendent of this division, have submitted plans for the subway on Main street. Estimated cost about $[illegible].

Montreal, Que.

It has been [illegible] that a new [illegible] will be constructed at St. Helen's Island this fall. The city has $50,000 to spend on improvements to the island, but as it is [illegible] taken by the Harbor Commissioners at the expense of the city.

Ottawa, Ont.

It is reported that the C. P. R. is securing options on private properties in the west end, adjacent to the round-house on Wellington street, either for its enlargement or to erect other buildings.

Toronto, Ont.

It is stated that the C. N. R. has acquired the Bay of Quinte line, thereby altering their policy for Eastern Ontario.

It is rumored that the C. P. R. will build a new line from Smith Falls here, and that already the survey has been made from Belleville.

Vancouver, B.C.

Tenders for constructing a wharf at the foot of Balsam street for the landing of supplies for the Kitsalano district were as follows: Ironsides, Rannie & Campbell, $9,796; Higman & Doctor, $10,720; H. V. Tucker, $11,985; Armstrong, Morrison & Company, $7,835.

Verdun, Que.

Quinlan & Robertson have contracted with this municipality for the construction of a river dyke.

Winnipeg, Man.

The estimates for new bridge and subway at Salter street are as follows: Bridge 26 feet wide for two street car tracks and two lines of traffic, with 2-foot 6-inch sidewalks, $283,350; 34 feet wide, $368,909; 42 feet wide, $451,359. Subway, same accommodation for traffic as the 26-foot bridge, $525,000. City Engineer Ruttan.

AWARDED.

Coaticook, Ont.

Helmer & Winstanley got the contract for the reinforced concrete bridge over the Coaticook river.

London, Ont.

The contract for concrete abutments and floor of bridge on First street, London Township, was awarded to F. E. L. Talbot, at $430. The following tenders were received: Kelly & Winters, $507, R. Waltham, $455, W. S. Odell, bulk tender for this and the county bridge, $1,123; Levi Crouse, $480; Joseph Patterson, $483; W. J. Anthistle, bulk tender for this and the county bridge, $1,340.

Smith's Falls, Ont.

M. McCormack, of Sudbury, and J. H. Morin, of Montreal, received the contract for the C. P. R. subway on Cornelia street. Work to be concluded by end of October.

Victoria, B.C.

A contract for the extension of the Kettle Valley Railway line from Rock creek, on the west fork of the Kettle river, a distance of 35 miles, has been awarded to L. M. Rice & Company, contractors, of Vancouver and Seattle. Construction work will be started within three weeks. Mr. J. J. Warren, of Toronto, president.

Public Buildings, Churches, Schools, etc.

Arthabaska, Que.

The Public Works Department, Ottawa, are calling for tenders until September 7 for erection of Public Buildings here. R. C. Desrochers, secretary.

Assiniboine, Sask.

The ratepayers will vote on September 8th on a by-law to borrow $4,200 to purchase a school site and erect a school.

Barrie, Ont.

The collegiate institute will be enlarged and improved. Estimated expenditure, $40,000. An architect has been secured.

Chilliwack, B.C.

Tenders will shortly be invited for the construction of the town hall.

Erickson, B.C.

Tenders have been invited by the Public Works Department for the erection of new school here, tenders to be in by September 7th.

Fort Frances, Ont.

Tenders were called until September 1st for erection of school for S. S. New Devlin. Plans, etc., at residence of G. C. Watson, LaVallee.

Fort William, Ont.

A site suitable to both this city and Port Arthur has been secured for the exhibition buildings.

A by-law to raise the sum of $12,000 for the purpose of improving the City Hall will be submitted to the ratepayers on September 26th.

Halifax, N.S.

G. J. Desbarats, deputy minister of naval affairs, and Alex. Johnston, deputy minister of marine, have been here to look over the ground for the Naval college.

Hamilton, Ont.

The committee on the Shelter Home for Children recommend the purchase of a large piece of land to be available as a prospective building site.

Lyleton, Man.

The post office, Home Bank branch, harness shop, livery stable were destroyed by fire on the 28th inst. Total estimated loss $30,000.

Montreal, Que.

Less than $25,000 will bring the total amount to the $200,000 required by the Notre Dame Hospital for the proposed new hospital building. The committee are confident that the total amount will be subscribed within a short time. Noted previously.

Moose Jaw, Sask.

At a meeting of the Board of Directors of the Saskatchewan Residential College for Boys the plans prepared by Mr. J. D. Atchison, architect, of Winnipeg, were accepted, and the architect authorized to call for tenders as soon as possible. An effort will be made to construct the foundation this year and complete the building by this time next year in readiness for the fall term. The plans call for a building 62 by 120 feet, three storeys high, of steel and brick construction, with ornamental stone.

New Westminster, B.C.

Among the seventeen tenders for the building of the Royal Columbia hospital, the price set upon the work was above that anticipated by the board of managers.

Niagara Falls, Ont.

C. M. Borter was instructed to draw up plans and specifications for the Main street fire hall, the building to be either brick or frame.

Ottawa, Ont.

Plans for the addition to the Howick Pavilion have been approved by the Ontario Government and call for expenditure of about $6,000.

It is rumored that the government has decided that the present residence of the Governor-General in Canada has almost outlived its usefulness and that plans are already under way for the erection of a new Rideau Hall on a new site.

Peterborough, Ont.

Tenders addressed to T. F. Matthews, will be received until September 3rd for the erection of new buildings for Murray street Baptist church. Plans, etc., at office of The Geo. Matthews Company, Limited, or at Royal Bank, Peterborough; also at office of the architects, Burke, Horwood & White, 28 Toronto street, Toronto.

Portage la Prairie, Man.

The plans for the new armory have been completed.

Tenders addressed to J. L. Swales, secretary-treasurer, were called until August 30th for one-roomed solid brick school at East Prospect S. D., No. 111.

Quebec, Que.

The terms of the contract affecting the sale of Champlain Market site to Transcontinental Commission state that work must be begun by November 1st. Noted previously.

Regina, Sask.

The plans for the new fire hall have been entrusted to the engineering department.

The Library Board here decided to extend the time for receiving plans for the new library building until September 9th.

Roberval, Que.

Tenders for public building here will be received until September 12th by R. C. Desrochers, secretary, Department of Public Works, Ottawa.

Rossland, B.C.

The Public Works Department are inviting tenders until September 30th for alterations, additions and repairs to the Court House here.

Saltcoat, Sask.

Tenders for making alterations and additions to public school here will be received until September 5th by E. J. W. Raymen, secretary. Plans, etc., at Builders' Exchange, Winnipeg, and at the offices of the architect, W. W. Lachance, Saskatoon and Yorkton.

Saskatoon, Sask.

A campaign for the raising of funds to enable the erection of a large well-equipped Y. M. C. A. building here will be started shortly.

St. Lambert, Que.

The new post office building under contemplation will cost about $35,000.

St. Thomas, Ont.

The proposition to erect new manual training building on Ross street will be laid before the school board shortly. Chairman Roberts.

Announcement has been made by Rev. Father West that the plans of the new church have been approved by His Lordship the Bishop. The new edifice is to be of stone. It is altogether likely contracts will be let in the near future.

Sydney, N.S.

A Canadian syndicate in affiliation with the Pantage Circuit of the United States will erect a theatre here at a cost of about $35,000.

Toronto, Ont.

A permit has been issued for the new St. Mary's club house addition on Bathurst street, $40,000.

Tenders have been called by the Department of Public Works for the preparation of site for the new residence for the Lieutenant-Governor on Bloor street H. F. McNaughten, secretary.

Tenders are being called until September 7th for the erection of Pathological Building for the General Hospital. Darling & Pearson, architects. See advertisement in "Tenders and For Sale Department" of this issue.

The Federal Government has secured 973 acres of land (Holliday farm) in the vicinity of Long Branch ranges, which will form part of the site for permanent barracks here. The Militia Department will also endeavor to acquire the 200 acres between for military purposes.

Tenders are being called by the Public Works Department until September 8th for plaster work in connection with reconstruction of west wing of Parliament Buildings. Plans, etc., at office of architect, E. J. Lennox. H. F. McNaughten, secretary. Advertisement in "Tenders and For Sale Department" of this issue.

Waterloo, Ont.

Tenders addressed to R. C. Desrochers, secretary, Public Works Department, Ottawa, will be received until September 14 th for erection of public building here. Plans, etc., with local post master and at postal station F, Yonge street, Toronto, and at the above Department.

Westbank, B.C.

Tenders have been invited until August 31st by the Public Works Department for the erection of new school here.

Winnipeg, Man.

Tenders for the superstructure of Westminster Church will be called shortly. J. H. G. Rusell, architect.

C. J. Brown, city clerk, is calling for offers of site for new exhibition grounds until September 15th.

At a recent meeting in the Church of Christ, corner of Kate and McDermot, it was decided to build another church of the denomination in the St. James district.

The St. Charles Country Club will erect a $50,000 club house on its property. Plans have been prepared. E. H. Macklin, secretary. Noted in previous issue.

Tenders are being called by the Board of Control until about September 8th for erection of home for treatment of incipient phthisis. Estimated expenditure, $20,000. Plans, etc., with Dr. Sharpe.

Building permits were issued for police sub-stations to be erected immediately in Fort Rouge and in North Winnipeg at $27,000 each.

Tenders addressed to G. G. Teeter, architect, Builders' Exchange, were received until August 31st for erection of church for Olivet Baptist congregation.

The Manitoba Government has purchased 49 acres of land next to the Agricultural College as site for new college buildings, one to be used for the Domestic Science Department.

Tenders addressed to J. H. G. Rusell, architect, McArthur Building, will be received until September 6th for all trades, except heating, in connection with the north branch Y. M. C. A. Building. Estimated cost, $55,000.

Tenders are being called by Public School Board until September 8th for heating and ventilating plant in each of the two technical schools. Plans, etc., with J. B. Mitchell, commissioner of school buildings. R. H. Smith, secretary-treasurer, W.P.S.B.

Competitive plans for the new Tubercular hospital are being invited by the Board of Control until September 12th. Noted previously. The Board of Control is calling until September 7th for supply of labor and materials for erection of tubercular hospital. Plans, etc., for same at office of Mr. G. G. Teeter, architect, Builders' Exchange Building. M. Peterson, secretary.

Yorkton, Sask.

The president of a United States Lutheran seminary, desirous of locating in Western Canada, is expected here shortly to confer with the town council regarding the location of a $20,000 college.

AWARDED.

High River, Alta.

Carmangay school contract was awarded to P. Taylor, this place, at $14,000.

London, Ont.

The Metal, Shingle & Siding Company, of Preston, were given the contract for roofing the main building of the Western Fair, at $970.

Montreal, Que.

The general contract for the erection of a three-storey school building, corner of Rosaire and Boyer streets, for the Catholic School Commissioners of Villeray, has been awarded to Jean Borderie, contractor.

The general contract for the erection of a church building on Church avenue for Corporation des Syndics St. Paul has been awarded to O. Martineau & Fils, general contractors, 1062 St. Denis street. Architect, Joseph Art. Godin, 299 St. Denis street.

Nanaimo, B.C.

The new fire hall contract was awarded to Mescher Bros., of Victoria, at $29,310. McDonald & Perry, of Vancouver, got the contract for heating at $2,690.

New Liskeard, Ont.

The contract for the library was let to Dalgleish Bros. This building is 52 feet by 42 feet; cost, $10,000.

Ottawa, Ont.

We are informed that the Board of Control has awarded contract for new fire station on Cumberland street to Burgess & Company, Ottawa, for $24,000. Other tenders received: Toms & Bouthillier, $28,000; Alexander & Campbell, $29,000; G. A. Crain, $29,686; A. G. Marshall, $29,785; all of Ottawa. For city hall general office fixtures, to R. A. Sproule for $2,600. Other tenders received: Library Bureau of Canada, $4,135; S. L. Kyle, of Ottawa, $4,700.

Quebec, Que.

The heating, ventilation and plumbing contracts for the Technical school, have been awarded to Mr. James Ballantyne, Montreal, for $53,000. The other contracts are still to be awarded. Rene P. Le may, M.I.A.C., architect, Quebec.

Toronto, Ont.

The following contracts have been awarded in connection with the sub-station, corner of [illegible] and Edward avenues: Mason work, Teagle & Son, $26,905, less $1,800 if artificial stone is used instead of Ohio stone, $25,105; roofing, Duthie & Company, $187; plumbing, Fred Armstrong Company, $110; total [illegible].

The following contracts were awarded for the new Humberside Collegiate Institute: Masonry, W. T. Joy, $21,536; carpentry, M. Hutcheson, $11,025; plastering, G. White, $2,593; roofing and tinsmithing, G. Duthie & Son, [illegible]; painting, Fred J. Cox, $1,244; plumbing, Fred Armstrong Company, $1,140; heating and ventilating, Fred Armstrong Company, $8,057; heat regulators, Johnston Temperature Regulator Company, $680; total, $47,869.

Winnipeg, Man.

The contract for the construction of the basement of the new church for the congregation of Westminster Church, has been awarded to Saul & Irish of Winnipeg.

Residences

Hamilton, Ont.

Recent building permits include: Bennet & Thwaites, three brick dwellings, on Homewood avenue, between Garth and Locke streets, $4,500; H. Thombs, brick dwelling, corner Stinton and Wilson streets to cost $2,000; E. & J. Buscombe, seven brick dwellings, York street, corner Sophia street, for Wm. Goldberg, $12,000; James Weir, three frame dwellings, Niagara street, between Land and Ship streets, to cost $3,000; J. F. Stuart, brick dwelling, Aberdeen avenue, between Locke and Garth streets, $4,000.

Montreal, Que.

Eleven tenements in Esplanade avenue, near St. Viateur street, were damaged by fire on the 26th inst. Estimated damage, $6,000.

Mr. Alphonse Piche, architect, Victoria Building, has prepared plans and specifications, tenders for which are being invited, for the erection of two cottages at Belisle, Que., for Wm. Martel, Esq.

Mr. H. Papineau is erecting eight flats on Papineau avenue by day work.

Mr. J. D. Langevin, Querbes and Fairmount avenues, is erecting 24 flats on Park avenue.

The Sisters of Providence are making alterations to their property on DeMontigny street. Day work.

Mr. H. Beaudry is making additions to stable on St. Lawrence Boulevard. General contractor, Jos. Laurier, 377 Ontario street east. Architect, H. Charbonneau, St. Henri Ward.

Roberval, Que.

The residence of Mr. A. Pelletier, advocate, was destroyed by fire on the 22nd inst. Estimated loss, $10,000.

Regina, Sask.

Tenders were received until August 30 th for erection of apartment block for Messrs. Gardner & Walker. Storey & Van Egmond, architects.

Ottawa, Ont.

Recent building permits include: T. C. James, solid brick dwelling, Canal street, $12,000. W. E. Hunt, three brick veneer cottages, Arlington avenue, $5,100; Robt. Edmondson, brick veneer dwelilng, Blackburn avenue, $2,500; C. Neilson, double brick veneer roughcast dwelling, Hawthorne avenue, $2,500; R. Blackburn, solid brick addition and alterations, Lisgar street, $2,500.

St. Boniface, Man.

Recent building permits include: The Sisters of the O. M. L. of the convent on Tache street, St. Boniface, a $15,300 addition to their building; G. C. Smith, house on Doucet street, $3,000; T. E. Lafrance, alterations to residence on Ste. Jean Baptiste street, $2,500; R. H. Metcalfe, house on Eugenie street, $5,000; E. G. Sweet, house on Dubuc street, $2,000; F. A. Devar, house, $2,600; K. B. Skagford, several houses, ranging in price from [illegible] to $4,000; A. Amos, house for the Monitoba Rolling Mills, [illegible].

Vancouver, B.C.

Recent building permits include: Mrs. E. [illegible], 740 Robson street, $6,000; J. Raleigh, 1675 Tenth avenue, $2,600; Johnston [illegible], dwelling, 2131 Victoria drive, $3,500; Wm Urquhart, Powell street, between Columbia and Carrall, $6,000; W. Mason, 1265 Eleventh avenue west, $3,800; J. A. Chisholm, 1976 Grant street, $2,700; F. [illegible], 1054 Pacific street, $3,000; Bacon & Mugford, 1885 Tenth avenue west, $3,500; S. J. Steeves, 2846 Birch street, $4,000.

Victoria, B.C.

Building permits include: R. McKinney for a dwelling on Government street to cost $2,900; Smith Bros., dwelling on Davie street, $2,450.

AWARDED.

Montreal, Que.

Mr. W. N. Boivin is erecting two houses houses corner Garnier and Mount Royal avenue. Contractor, Alex. Brosseau, 129a Berri street. Architect, R. A. Brassard, 9 St. James street.

The contract for plumbing at residence being erected for Mr. Alex. Stevenson at Baie d'Urfee has been awarded to John Allan. Architect, Mr. Kenneth G. Rae; general contractor, John A. Gordon.

Victoria, B.C.

The contract has been awarded to D. C. Fulton, of Vancouver and Victoria, for the erection of an apartment house on the southeast corner of Vancouver and Couttes streets for the Mount Edwards' Apartments Syndicate, to cost $70,000. W. D'O. Rochfort, architect.

Business Buildings and Industrial Plants

Brantford, Ont.

The Penman Manufacturing Company have closed a deal with the city council whereby an $80,000 extension will be erected in the Holmedale district.

Berlin, Ont.

The by-law to loan $15,000 to Baetz Bros., recently burned out, was defeated.

Brandon, Man.

J. F. Allen, of Davenport, Iowa, is stated to be favorably impressed with Brandon as a suitable location for a branch biscuit factory.

Blairmore, B.C.

Senator Peter McLaren's saw mill recently destroyed by fire on July 17th, it is stated, will be rebuilt.

Chatham, Ont.

It is reported that the Canadian Grain Shocker Company, Limited, will locate in this city. Chas. Matthews, president; E. Nyberg, managing director.

Clavering, Ont.

Mr. Simmie's saw mill here was destroyed by lighting on or about the 23rd inst. Estimated loss, $4,000.

Chippewa, Ont.

It is announced that the Norton Carborundum Company will almost double its plant here.

Durham, Ont.

The by-law to grant $20,000 as a loan to the Durham Furniture Company for extensions will be submitted to the ratepayers on the 2nd September.

Duncans, B.C.

It is announced that the work of erecting the mill here, capacity 100,000,000 feet per annum, will be commenced shortly. Mr. Marsh, who is interested financially, has now his headquarters in Victoria and it is stated, has selected the site. Noted in issue of June 29th.

Hamilton, Ont.

The Canadian Westinghouse Company has a permit for the erection of an addition to its plant to cost $22,000. Additions to the value of $100,000 are expected. A concrete fire hall will be erected at the corner of Milton street and Myrtle avenue.

The Eureka Smoke Consumer Company, of Rochester, N.Y., will establish a plant here at a cost of $25,000. Ald. Kingdon is interested.

Merritt, B.C.

It is altogether probable that a large sawmill will be placed on the Coldwater river about ten miles from here. The project is in the hands of the American Timber Holding Company, which owns most of the timber in this district. It is estimated that it controls 100,000,000 feet of timber.

Masson, Que.

The flour mill here owned by Senator Edwards, of Ottawa, was destroyed by fire on the 23rd inst.

Montreal, Que.

Information regarding the building for the National Acme Manufacturing Company can be obtained from E. L. Baugh, 107 St. James street. Noted in last issue.

A. E. Rea & Company, Limited, have taken out a permit for a store which is to be one of four storeys and fireproof throughout. Cost, $367,752. The Canada Sugar Refining Company has a permit for a new factory on St. Patrick street, $18,000; the Pipper Light & Power Company has one for a similar building on St. Remi street, St. Henri, $18,000, and Mr. James Robertson has a permit to put up a factory on Shannon street, $5,500.

A building permit has been taken out for a $37,000 C. P. R. depot at Mile End.

North Vancouver, B.C.

M. C. Wiegand, it is expected, will very soon erect another large block on First street, west of Lonsdale avenue.

Nanaimo, B.C.

Mr. M. J. Foley, the well-known timber cruiser, it is reported, will erect a sawmill at Nanoose Bay. Estimated outlay, $30,000. Construction will start in about two weeks.

Ottawa, Ont.

W. E. Noffke has been chosen as architect to prepare plans for a seven-storey building for Blackburn Brothers on the corner of Metcalfe and Sparks street. The building will be about 40 feet on Sparks by 80 feet on Metcalfe. It will be steel fireproof construction, and will have stores, etc., on the main floor. Tenders will be called very soon.

George Matthews Company has instructed W. E. Noffke to prepare plans for a four-storey building on the corner of Rideau and Mosgrove, of brick. The stores on the main floor will be about the most up-to-date in the city. Tenders will be called this week.

John McNee & Sons will erect a big five-storey addition to their factory on Clarence street.

Owen Sound, Ont.

The by-law to grant $100,000 towards a shipbuilding and dry-dock plant, which will involve the expenditure of $1,000,000, was carried by the ratepayers. The by-law to authorize the loan of $20,000 to a furniture manufacturing company (of which Mr. Minchiner, of Stratford, is the financial head), was also carried.

Princeton, B.C.

Among those interested financially in the new cement works to be erected in the suburbs here are the following: Mr. L. W. Shatford, M.P.P.; J. A. Harvey, K.C., and Mr. L. W. Stone. Proposed expenditure, $250,000. It is understood that a sawmill will be put into commission to supply lumber.

Port Arthur, Ont.

On September 8th the ratepayers will vote upon a by-law to issue $12,000 car barns debentures, due 1940; $2,000 swimming bath debentures due 1925. T. McTeigue, City Clerk.

Port Mann, B.C.

That a big English steel works, capitalized at $2,000,000, will be established here is the persistent rumor. It is believed that the company is closely associated with the Canadian Northern, and that the announcement of the proposed new works will be made in a few days.

Roberval, Que.

The warehouse owned by Mr. A. Laiancette, was destroyed by fire on the 22nd inst. Estimated loss, $12,000.

St. John, N.B.

It is announced that the C. P. R. has purchased the New Brunswick Cold Storage Company's property on Main street, where it is reported a station and hotel will be built.

Toronto, Ont.

Permits have been issued for the erection of the following bank buildings: Molsons Bank, 1716 Dundas street, two-storey brick building, to cost $12,000; Imperial Bank, corner of Dundas and Bloor streets, $10,000; and Imperial Bank, corner of Queen street and Roncesvalles avenue, $9,000.

Vancouver, B.C.

Work will be commenced in a few days at the Fraser River Mills on the new planing mill, sash and door factory, shingle and lath mill that it was announced some months ago would be erected.

Woodstock, Ont.

It is stated that a site has been purchased here for the Woodstock Textile Company.

Vonda, Sask.

The by-law to grant the sum of $8,000 to Messrs. Kapes & Kinvig, of Columbus, N. D., for the erection of flour mill here was carried. Estimated cost, $16,000.

Welland, Ont.

It is stated that the Chemical Laboratories, Limited, of Toronto, will amalgamate with a large American concern and locate at Welland.

West Toronto, Ont.

It is stated that much new machinery will be required in the new $100,000 addition to the Canada Cycle & Motor Company's plant.

Wellandport, Ont.

On the 25th inst. the new post office, Goring's store, Durham's hotel, the telephone office and other buildings were destroyed by fire. Total estimated loss, $40,000.

Winnipeg, Man.

Options have been secured on several sites here and in St. Boniface for the establishment of a branch factory of the Imperial Wire Company. Major Currie, M.P., is interested.

William Richmond, local manager for Wortman-Ward Company, of London, Ont., it is stated, has been interviewing architects with regard to the erection of a factory, 200 feet long by 60 feet wide, here, with provision made for extensions.

F. W. Heubach, of the Winnipeg Development & Industrial Bureau, has received inquiries from a boot and shoe firm in regard to the establishment of a factory. Inquiries have also come from a firm manufacturing farm implements, a rug and carpet manufacturer, also a manufacturer of blankets, Berlin, Ont., and others.

AWARDED.

Fort William, Ont.

Carter, Halls, Aldinger Company, general contractors of this city, have been awarded the contract for the construction of the new Canadian Pacific car shop.

London, Ont.

The contract for the erection of transformer station was awarded to Hyatt Bros., at $3,550.

Montreal, Que.

The contract for the erection of a factory building for the Canadian Rubber Company, at the corner of Notre Dame and Monarque streets, has been awarded to Mr. E. G. M. Cape, general contractor. T. Pringle & Sons, Limited, architects.

The contract for alterations to the premises of the Boxer Estate, 132-134 St. James street, has been awarded to Messrs. Peter Lyall & Sons, Limited. Messrs. Ross and McFarlane, architects.

Messrs. Paterson, Wilson & Company, Board of Trade Building, have awarded the contract for the erection of a warehouse building on Casgrain street to the Granite Construction Co., of New York.

General contract for the erection of the factory building by the Alaska Feather & Down Company, on St. Ambroise street, has been awarded to Shearer, Brown & Wills, general contractors, 225 St. Patrick street. Architects, Ross & McFarlane, 1 Belmont street.

The Wire & Cable Company, Guy street, and are erecting a shed on Guy street. General contractors, Shearer, Brown & Wills, 225 St. Patrick street. Architect, J. W. Carmichael, Bell Telephone Building.

Toronto, Ont.

Contract for the galvanized iron and roofing on store building for the Wm. Davies Company, Yonge and Bloor streets, has been awarded to A. B. Ormsby, Limited.

Welland, Ont.

P. S. Peacock has been awarded the contract for the construction of the Chipman Holton factory.

Power Plants, Electricity and Telephones

Belleville, Ont.

The Seymour Electric & Power Company are undertaking the construction of two power lines to Belleville, one from Campbellford and the other from another point on the Trent river.

Calgary, Alta.

The street railway extension by-law for $484,000 has been given the required readings by the council, also the sub-way for $40,000. City Engineer Child, in his report on the development of 3,500 h.p., estimates the cost at $800,000, the cost per h.p. being $25.

Fernie, B.C.

See "Waterworks."

Guelph, Ont.

September 26th is the date set for the voting of the People's Railway by-law for purchase of stock, etc.

Montreal, Que.

Tenders for street lighting and power for ten years, addressed to Board of Commisisoners, will be received until September 12th. L. N. Senecal, secretary.

Prince Rupert, B.C.

In the report on the installation of an electric light plant, the total cost is placed at $8,983. The following items are included: Generator, 60 k.w., with exciter switchboard, $2,000; new poles, $417; engineering and erection, $1,000; 64,118 feet of No. 4 x No. 6 wire, $2,088; pole and cross arms, transformers, etc., $1,478; engineering and erection, $2,000. Proposals for gas producer plant to operate a 75 k.w. a.c. generator were given. Cost, $11,840. The proposition for the installation of a steam plant at the foot of McBride street of sufficient capacity to provide 5,000 16 c.p. lamps for section 1, of which the cost would be $30,000, was also considered.

It is stated that new equipment for the new municipal telephone system will be required.

St. Catharines, Ont.

The promotors of the Niagara Falls, Welland and Dunnville Electric Railway will have Roberts & Abbott, engineering firm of Cleveland, make the report on their proposed scheme.

Toronto, Ont.

In the report on the underground railway system of tubes, the experts, Messrs. Jacob & Davies, give as the approximate cost, $10,000,000.

Waneta, B.C.

The application of the Pacific Exploitation Company for permission to erect a large electric power plant on the Pend Oreille river near here has been granted and plans for the plant with a daily capacity of 25,000 horse power have been forwarded for consideration by the lieutenant-governor. The president of the new company is Mr. H. G. Hall, of Nelson; J. W. Falls is manager, and A. Y. Lorch, secretary. The promotors expect to furnish electric energy to the Pend Oreille valley, the Sheep Creek and Ymir districts, and to the Orient, Chewelah and Metaline districts on the other side of the boundary. Rumors are also in circulation that the C. P. R. is interested in the project, and that the power will be used for the electrification of part of its transportation system. W. B. Pool, of Nelson, is interested.

AWARDED.

New Westminster, B.C.

The Canadian British Insulated Company of Montreal, Lawford Grant, managing director, have received a contract for 10 miles of street railway equipment from the B. C. E. R.

Miscellaneous

Montreal, Que.

Recent building permits include: W. N. Boivin, 335 St. Lawrence Boulevard, house containing three dwellings, $3,500; H. Montcalm, 470 Aylwin street, house containing five dwellings, $5,000; B. Boyte, 1881 Boyer street, house containing three dwellings, $3,000; Paterson, Wilson & Company, Board of Trade Building, a one-storey building on Casgrain street, $13,000; F. Aubin, 2883 Esplanade avenue, house containing two dwellings, $3,000; Joseph Thibeault, 1 Stadacona Lane, houes containing four dwellings, $4,080; H. Papineau, 880 Mount Royal avenue east, four houses containing eight dwellings on Papineau avenue, $9,000; P. Blain, 99 Rose de Lima street, house containing four dwellings on Notre Dame street west, $5,000; C. P. R. Company, Mile End, a station building, St. Lawrence Boulevard and C. P. R. tracks, $37,000; J. D. Langevin, Fairmount and Querbes avenues, three houses, $32,000; F. Therrien, 373 Dorion street, three houses containing nine dwellings, $8,000; Corporation des Syndics St. Paul, church building on Church avenue, Cote St. Paul, $36,275; B. Depatie, 2077 St. Urban street, house containing four dwellings on Waverley street, $3,500; O. Cagnon, 1243a Des Erables street, house containing three dwellings, on Messier street, $3,000; Jacob Shugar, 37 St. Charles Borromee street, house containing two dwellings, stable and shed, on St. Urbain street, $8,300; Villeray Catholic School Commissioners, 2760 Labelle street, a three-storey school building Rosaire and Boyer streets, $35,000; Alaska Feather & Down Company, St. Antoine street, a two-storey factory on St. Ambroise street, $30,000; Wire & Cable Company, Guy street, a shed building on Guy street, $4,000; Sisters of Providence, Fullum and St. Catherine streets, alterations to property on DeMontnigy streets east, $4,225; H. Beaudry, St. Denis and Craig streets, additions to stable at 275 St. Lawrence Boulevard, $6,900; Boxer Estate, 179 St. James street, alterations to property 132-134 St. James street, $30,000.

Ottawa, Ont.

Tenders addressed to A. Johnston, deputy minister of Marine and Fisheries, will be received until October 31st for the construction of a twin screw steel lighthouse and buoy steamer for the Pacific coast, etc.

It is stated that the plans for the cruisers for the Canadian navy will not be sent out to Canada as was first proposed. It would be necessary to have experts accompany them and as the tenders will be chiefly by British firms, it is thought unnecessary. Any Canadians firms which would tender would do so in conjunction with British firms.

Pont Rielle, Que.

Tenders are being called by the Public Works Department until September 19th, 1910, for the construction of ice pier in River-Quareau. R. C. Desrochers, secretary.

Quebec, Que.

Within the next two of three months the National Transcontinental Commissioners will invite tenders for the construction of car ferries to carry traffic across the St. Lawrence river until the Quebec bridge is built. It is expected that the new ferries will have a capacity of 30 freight cars.

Toronto, Ont.

Recent building permits include: [illegible] E. Case, 2 detached 2-sty. and attic brick

(Continued on page 29)

Tenders and For Sale Department

Debentures for Sale

Sealed tenders will be received up till noon, WEDNESDAY, SEPTEMBER 14TH, 1910, for the purchase of $7,500.00 High School Debentures of the Town of Oshawa. Dated August 2nd, 1910, bearing interest at 4½ per cent. per annum and payable at the office of the Treasurer, Oshawa, in 30 equal annual payments of $460.45 of principal and interest. Accrued interest to be paid by the purchaser.

The highest or any tender not necessarily accepted.

THOS. MORRIS,
Town Clerk.
36

Tenders

Toronto General Hospital College Street

Tenders will be received by the undersigned up till noon,

Wednesday September 7th, 1910

for all the various trades required in the erection and completion of the Pathological Building.

Plans and specifications and all other information may be obtained at the office of the architects.

The lowest or any tender not necessarily accepted.

DARLING & PEARSON,
2 Leader Lane, Toronto.
35

City of Regina

Sidewalk Construction

Sealed tenders, addressed to the undersigned City Clerk and endorsed on envelopes "Tenders for Sidewalk Construction," will be received up to 12 o'clock noon, THURSDAY, SEPTEMBER 8TH, 1910, for approximately 140,000 square feet of Concrete Sidewalk.

Particulars may be had upon application to the City Engineer.

A marked cheque for $1,000 must accompany each tender. The cheques of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

L. A. THORNTON,
City Engineer.

A. E. CHIVERS,
City Clerk.
35

To Contractors

The Reeve and Council of the Township of Morris, County of Huron, are asking for tenders for the construction of four large municipal drains.

Plans, profiles, specifications and estimates may be seen at the clerk's residence.

The tenders will be opened at the Council Chamber, Morris, on MONDAY, THE NINETEENTH DAY OF SEPTEMBER, 1910, at 2 o'clock p.m.

A. MacEWEN,
Clerk.

Bluevale, August 23rd, 1910. 36

Department of Railways and Canals

QUEBEC BRIDGE

Tenders for Superstructure

Notice to Contractors

Extension of Time for Receiving Tenders

The time for receiving tenders for the superstructure for the Quebec Bridge advertised to be received up to the 1ST OF SEPTEMBER, 1910, is hereby extended for one month, viz.: up to the first of October, 1910.

By Order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 9th August, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 35

To Contractors

Sealed tenders addressed to H. F .McNaughten, Secretary Public Works Department, Parliament Buildings, Toronto, will be received at this department up to noon on THURSDAY, SEPTEMBER 8TH, 1910, for the

Plaster Work

in connection with the reconstruction of the west wing of the Parliament Buildings. Plans and specifications can be seen at the office of Mr. E. J. Lennox, architect, 164 Bay Street, and at this department. An accepted bank cheque, payable to the order of the Minister of Public Works, for 5 per cent. of the amount of the tender and the bonafide signatures and addresses of two sureties, or the name of a guarantee company approved by this department prepared to give a bond for the due fulfilment of the contract, must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance. The department will not be bound to accept the lowest or any tender.

J. O. REAUME,
Minister of Public Works, Ontario.

Department of Public Works, Ontario,
Toronto, 27th August, 1910.

Newspapers publishing this advertisement without authority will not be paid for it. 35

Assignees Sale of Cement Plant

The Assignee of the Grey and Bruce Portland Cement Company of Shallow Lake, Limited, will offer for sale by public auction at the Seldon House, Owen Sound, on the 15TH DAY OF SEPTEMBER, 1910, at 2 o'clock p.m., all the lands, plant, machinery and chattels of the said company. For further particulars apply to A. D. Creasor, Owen Sound, Solicitor for Assignee. 35

City of Regina

Pavement Construction

Sealed tenders, addressed to the undersigned City Clerk and endorsed on envelopes, "Tenders for Pavements," will be received up to 12 o'clock noon, THURSDAY, SEPTEMBER 8TH, 1910, for approximately 33,000 square yards Pavement and approximately 19,000 lineal feet Curb and Gutter, and 3,000 lineal feet of Curb.

Particulars may be had upon application to the City Engineer.

A marked cheque for $6,000 must accompany each tender. The cheques of unsuccessful tenderers will be returned. The lowest or any tender not necessarily accepted.

L. A. THORNTON,
City Engineer.

A. E. CHIVERS,
City Clerk.
35

Positions Vacant

Advertisements under this heading two cents a word per insertion. Box No. ten cents extra

SALESMAN WANTED—To sell insulating varnishes, either alone or as a side line. Must have good connection with electrical trade. Write Box 129 "Contract Record," Toronto, Ont. 35

Miscellaneous

Advertisements under this heading two cents a word per insertion.

CONTRACTOR'S OUTFIT FOR SALE—Six Wheeler, No. 3, concrete line plant, nearly new. Owner going into another line of business. Joseph Patterson, Box 114, St. Marys, Ontario. 35

STEAM HOIST FOR SALE.—Fifteen H.P. Steam Hoist, two cylinder, single reversible drum, manufactured by Georgian Bay Engine Works, complete with wire cable. Will accept reasonable offer for immediate sale. STINSON-REEB BUILDERS' SUPPLY COMPANY, Limited, 904 Eastern Townships Bank Building, Montreal, P.Q. 36

It is stated that Jude E. Boudreau, planing mill, Rogersville, N.B., has assigned.

Verret & Desautels, contractors, Sherbrooke, Que., it is reported, have dissolved

The MacGregor-Gourlay Company, Limited, Galt, Ont., have sold out to Canada Machinery Corporation, Galt, Ont.

Hespeler Machinery Company, Limited Hespeler, Ont., have sold out to the Canada Machinery Corporation, Galt, Ont.

It is reported that inspectors have been appointed to wind up the estate of the F. C. Hunt Plumbing Company, London, Ont.

Miscellaneous

(Continued from page 27)

dwellings, Indian road, $8,000; Wm. Hewitt, 2 detached 2-sty. and attic brick dwellings, Algonquin and Indian road, $7,500; J. Ellis, pair 2-sty. semi-detached brick dwellings, Booth avenue, $3,800; Hayward & Whitehorn, pair 2-sty. semi-detached brick dwellings, Lansdowne avenue, $4,000; Campbell & Co., pair 2-sty. brick dwelings, Yarmouth road, $4,500; G. A. McTaggart, 2-sty. brick store and dwelling, Roncesvalles and Pearson avenue, $3,900; W. W. Stephen, 1½-sty. brick dwelling, near Kingston road, $4,000; Charles Parker, 2 pair 2 detached brick dwellings, corner Davenport road and North Brunswick, $7,200; Consumers' Gas Co., 2-sty. brick washing machine house, Berkeley street, $10,000; Jas. Hewlett, 2-sty. brick dwelling, Balmoral avenue, $3,400; Geo. J. Bryan, 2½-sty. brick dweling, Russell Hill road, $7,000; W. H. Wright, 2-sty. brick dwelling and dairy, Symington avenue, $2,800; St. Mary's R. C. Parish, 2-sty. brick addition to club house, Bathurst street, $40,000; Charlie Ling, 2 attached 2-sty. brick dwellings, 237, 239 and 241 St. Helens avenue, $6,500; J. Singer, 1-sty. brick theatorium, near Brock avenue, $3,500; Geo. Heintzman, 1-sty. brick addition to dwelling, Ellis and Connery, $4,000; Galena Signal Oil Co., 2-sty. brick cooperage and storage, Royce avenue, $12,000; Geo. T. Robinson, 2-sty. brick building, Armstrong avenue, $6,000; A. & A. Grand, pair 2-sty. and attic semi-detached brick dwellings, $6,000; Ed. Corner, 2-sty. brick dwelling, 698 Manning avenue, $4,000; J. L. Owen, 2 detached 2½-sty. brick dwelling, 323 Perth avenue, $4,000; American Abell Co., 1-sty. brick addition to factory, corner Abell and C. P. R. tracks, $5,500; W. C. Samto, 2½-sty. brick dwelling, on Rowanwood avenue, $4,000; D. J. Moore, 2-sty. brick store and dwelling, Rhodes and Queen, $4,000; F. G. McBrien, 1-sty. and attic brick dwelling, near Castle Frank avenue, $7,000; J. F. Jefferson, 2½-sty. brick dwelling, near Argyle street, $3,000; Rector & Church Warden of St. Bartholemew, church, corner Wilton avenue and Blair, $10,000; Geo. Marshall, pair 2-sty. semi-detached, brick dwelling, Berkeley and Queen, $4,500; Wm. H. Moore, pair 2½-sty. semi-detached brick stores and dwellings, near Lee avenue, $5,000; John McKnight, 2-sty. and attic brick dwelling, 39 Walmer road, $9,000; Dr. L. F. Millar, 2-sty. and attic brick dwelling, near Whitney avenue, $8,000; W. R. Johnston, Jr., 1-sty. brick living room, corner Elm avenue and Nanton Crescent, $4,300; V. K. Bryce, 2½-sty. brick dwelling, near Heath street, $5,000; McFarlane Ladder Works, 2-sty. galvanized iron work shop, River street, $3,000; Christie Brown, Limited, 1-sty. brick shipping room, George street, $3,750; The Modern Construction Co., Ltd., 2 pair semi-detached brick dwellings, Montray street, $9,000.

Winnipeg, Man.

Five tenders for well drilling machinery were received by the board and referred to the city engineer for consideration. Two out of the five will probably not be considered at all as they do not conform to the regulations specified by the city.

Recent building permits include: G. Edgett, Wilton avenue, $[illegible]; E. W. Perry, house, Atlantic, $4,000; A. W. Tricky, house, Lenore, $3,300; three [illegible] and warehouse for the D. R. Dingwall Company, Albert street, $[illegible]; Westminster Church, northwest corner Maryland and Buell, $22,000; warehouse for the David son Manufacturing Company, May street, opposite Heaton avenue, $17,000; dwelling for J. Milovitch, Mulvey avenue, $24,000; dwelling on Lilac, between Mulvey and Fleet, $9,000; stores and apartments for F. Cohen, King street, $15,000; dwelling for Mrs. S. C. E. Crawford, Roslyn road, $25,000; J. C. McNabb, terrace, Bannerman, $4,000; W. McIntosh, dwelling, Home avenue, $4,200; E. H. Perry, dwelling, Atlantic, $4,000; J. Edgett, dwelling, Harvard, south side, $5,500; St. John's College, dwelling, Anderson, between Main and Aikins, $5,000; A. W. Trickey, dwelling, Lenore, east side, $3,300; J. T. Watson, dwellings, Burnell, east side; Arnold, south side, between Pembina and Nassau; Hetherington, west side, between Nassau and John, $5,400; West End Really Company, dwelling, Ruby, $4,000; T. K. Moore, dweling, Home, east side, between Sargent and Ellice, $4,000; A. McCance, dwelling, Horne, west side, $2,500; C. M. Bull, dwelling, Oakwood, west side, $5,000; W. J. Sullivan, dwelling, west side, Hespeler, $2,500; J. McDonald, dwelling, Wolseley, $5,000; H. Hirst, dwelling, Redwood, $4,500; M. A. Cameron, dwelling, Home, west side, $4,500; L. R. MacRae, dwelling, on Lansdowne, $2,700; H. J. Morgan, dwelling, west side, Ashburn, $2,500, and dwelling, east side, Ashburn, between Classic and Wolever, $2,500; C. W. Fanthorpe, dwelling, north side, Alexander, on Worth, $2,600.

New Companies

The Steelton Brick & Tile Company Limited, Sault Ste. Marie, Ont., capital $100,000. Incorporators, Arthur W. Holmsted and James L. Ross, barristers-at-law Toronto, Ont.

The South Shore Lumber Company Montreal, Que., capital $20,000. Incorporators, Harold E. Walker, advocate, and J. R. Walker, manufacturer, both of Westmount, Que.

Sheet Metal Products Company of Canada, Limited, Toronto, Ont., capital $5,000,000. Incorporators: Robt. H. Paterson, and Thomas E. Moberly, barristers-at-law, and Herbert H. Loosemore, banker, all of Toronto.

Russell Shale Bricks, Limited, Ottawa, Ont., capital $300,000. Incorporators: Angus W. Fraser and James G. Gibson, barristers-at-law, Ottawa.

Dominion Mosa-Tile Company, Limited, Montreal, Que., capital $100,000. Incorporators: Joseph G. Dupont, physician, Montreal, and Theodore Daoust, architect, Montreal.

National Paving and Contracting Company, Winnipeg, Man., capital $100,000. Incorporators, John A. Thompson, lumberman, and Robert W. Hugg, barrister-at-law, both of Winnipeg.

International Peat Engineering Company, Limited, Windsor, Ont., capital $20,000. Incorporators, Gustav E. Carlsson, peat engineer, and Leo. B. Lincoln, manager, both of Farnham, Que.

Power Economies, Limited, Montreal, Que., capital $20,000. Incorporators: Richard T. Heneker, K.C., and Alexander H. Duff, advocate, both of Montreal, Que.

McLaughlin Paint Company, Limited, Ottawa, Ont., capital $15,000. Incorporators, John A. Craig, druggist, and Frederick H. Honeywell, barrister-at-law, Ottawa, Ont.

Charles Gate & Son Company, Limited Winnipeg, Man., capital $50,000; incorporated to carry on the business of general contractor and builder. Incorporators, Charles E. Gate and Henry Gate, plumbers, and steamfitters, Winnipeg, Man.

St. Lawrence Bridge Company, Limited, Montreal, Que., capital $500,000. Incorporators, Robert C. McMichael and Rennie O. McMurty, advocates, Montreal, Que.

National Motor Company of Canada, Limited, Montreal, Que., capital $75,000; incorporated as engineers, steam, electrical and other engine manufacturers. Incorporators: Louis A. David, advocate, and Chas. J. E. Charbonneau, notary public, both of Montreal, Que.

Le Credit Hypothecaire Canadien, incorporee, Montreal, Que., capital $1,000,000, incorporated to carry on the business of builders, contractors and furnishers of material. Incorporators, Messrs. T. Rinfret, advocate, and Victor E. Beique, student-at-law, both of Montreal.

Canadian Power & Paper Company, Limited, Toronto, Ont., capital $10,000,000; Incorporators, Frank H. Phippen, K.C., and Gerard Ruel, barrister-at-law, both of Toronto.

The Eastern Townships Lumber Company, Limited, Sherbrooke, Que., capital $50,000. Incorporators, Edward C. Goodhue, lumber dealer, and Harold E. Goodhue, lumbermen, both of Sherbrooke.

The Skeena Timber Company, Limited, Toronto, Ont., capital $1,000,000. Incorporators Adam W. Ballantyne and Charles F. Ritchie, barrister-at-law, Toronto.

The Balmoral Brick Company, Limited, Winnipeg, Man., capital $40,000. Incorporators, John B. McLean, salesman, Winnipeg, Man., and John H. McClure, brick manufacturer, Balmoral, Man.

Howick Telephone Company, Limited, Gorrie, Ont., capital $7,000. Incorporators, Richard Carson, Chas. L. Andrews and Robert H. Stepheus, all of Gorrie, Ont.

Alnwick Rural Telephone Company, Limited, Roseneath, Ont., capital $3,700. Incorporators, Edgar W. Hayden and Fredrick A. Aylesworth, physicians, Alnwick, Ont.

Stone Lumber Company, Limited, Sault Ste. Marie, Ont., capital $100,000. Incorporators, John A. McPhail, barrister at law, and Samuel G. Stone, both of Sault Ste. Marie, Ont.

Claremont & Ashburn Telephone Company, Limited, Claremont, Ont., capital $10,000. Incorporators, Robert W. Ward and Ralph Brodie, physician, Pickering township, Ont.

It is stated that Woods, Limited, Winnipeg, Man., manufacturers of lumbermen's supplies, etc., have sold their Winnipeg branch to Finnie & Murray.

Building permits issued at London, Ont. during July, 1910, represented a value of $37,700, as compared with $17,808 for the corresponding month of 1909. For the first seven months of 1910 and 1909 the totals were respectively $490,166 and $631,597.

The B. C. Gazette gives notice of the incorporation of the following companies: [illegible] & Higgins (Canada), Limited, capital $100,000, incorporated as architects, timber merchants, manufacturers of iron and brass work, etc.; British Empire Timber Company, Limited, capital $1,500,000; Canadian Boving Company, capital $[illegible], incorporated to carry on [illegible] [illegible] contractors [illegible]; Otis-Fensom Elevator Company, Limited, capital $[illegible], incorporated [illegible] elevators and hoisting machinery; Empire [illegible] Company, capital $[illegible]; [illegible] Lumber Company, capital $[illegible].

Montreal's Improvement Schemes

The Metropolitan Parks Commission of Montreal at its meeting last week discussed several important matters, including the appropriation of large blocks of land throughout the city for playgrounds and parks and the adoption of a general plan of procedure by the Commission. The latter suggestion was brought forward by Mr. D. V. Middleburg, architect, who favored the foundation of zoological and palm gardens, to be completed in 25 years. A boulevard scheme was propounded by Mr. George Mathys, ex-Belgian vice-consul, who touched on the restriction lines question. This brought from Mr. Lighthall the declaration that he was surprised at Montreal's long silence on this subject. The city should at once pass an ordinance prohibiting building over a certain depth from the sidewalk. The Commission went into private session without arriving at any decisions.

Contractors Busy on Canadian Northern

The contractors on the Canadian Northern Railroad extension have begun active operations near Smithville, Minn.

The right of way is being cleared, a large crew of men having been set to work. Several of the engineers employed by the road have taken residences at Smithville, and from now on it is expected that the work will be rushed.

The contract for the road between Duluth and Virgania has been sublet in sections of from five to ten miles each. Foley, Welsh & Stewart are the general contractors, and E. M. Olsen & Company, of Duluth, have been given the contract for the erection of section houses along the way.

H. T. Hazen, chief engineer of the road, says that the preliminary work is progressing nicely. Mr. Hazen says the line will cost about $35,000 a mile. There will be 500 feet of rock tunnel at Short Line Park, according to the chief engineer.

No trouble is experienced by the line in getting engineers and laborers. Several lines have been laying off their help, and it comes at a time to be of help to the Canadian Northern.

Missisquoi Marble Company

At a meeting of the Missisquoi Marble Company, of Phillipsburg, Que., Mr. J. W. McConnell, of Montreal, and Mr. Geo. R. Crowe, of Winnipeg, were elected directors.

Rapid progress is being made by the Missisquoi Marble Company in the development of their property. The new addition to the plant which has been under construction for some months, will treble the company's production capacity.

The directors in attendance at the meeting were: Harry Richardson, Kingston, Ont., president; Jas. Playfair, Midland, Ont., and Robert J. Dale, Wm. Mann, S. H. Ewing, W. J. Morrice, Henry Timmis and J. W. McConnell, Montreal.

C. N. Bell, secretary of the Winnipeg Board of Trade, who returned last week from a visit to the Pacific coast, states that business conditions throughout the whole of western Canada are excellent.

The fiscal year of Allis-Chalmers ended June 30th, was a considerable improvement over 1909. It is understood that the net balance after allowing for about $1,700,000 of interest and depreciation was between $400,000 and $500,000,

Officials of the Canadian Pacific Railway have concluded negotiations for the purchase of nearly a mile of river front property at Kamloops, B.C., on the North Thompson river, at a cost of approximately $100,000. On this property the main running tracks of its line will be constructed, and also yard and terminal facilities. The total cost of this new construction work is set at approximately $200,000.

Vancouver and the Coast

The machine shops of Vancouver and New Westminster were visited lately by agitators from San Francisco unions, with the result that the men went on strike for shorter hours and higher wages. In this connection it may be well to quote the words of a leading paper of the Golden Gateway city: "San Francisco is suffering from her subservience to labor. To-day it costs nearly 40 per cent. more to manufacture goods here than in any eastern city. To-day there are but one or a few successful local manufacturing plants where a decade ago there were almost hundreds."

F. A. McDiarmid, the new city solicitor of Victoria, has warned the city council that debentures cannot be issued for any longer period than the life of the work to be covered by said debentures. This is contrary to the practice in the past, and aldermen are greatly disturbed as a result.

Superintendent Steve Madison, Secretary Boultbee and Engineer Burwell, of the Vancouver Waterworks Department, were delegates to the recent irrigation convention at Kamloops.

The expert employed by the Water Commissioners of Victoria to report upon a new source of water supply is opposed to the Sooke lake proposition. He estimates that it will cost $30 a foot to bore a tunnel for a pipe line through the Sooke hills, and this is considered prohibitive.

The city of New Westminster is forging ahead at a rapid rate. At the present time the public works commenced or authorized aggregate the sum of one million dollars.

Vancouver is easily a lap or two in advance of most cities in the application of auto equipment to the city service. Its fire department autos have been the envy of visiting aldermen; the auto police patrol and ambulances have demonstrated their worth, and now the city garbage is collected and delivered at the city incinerator in two auto scavenging wagons procured in England. Their capacity is double that of the ordinary wagon, and the cost of maintenance and operation is much less than the horse-drawn equipment. Auto watering carts will follow.

Vancouver is to have a modern dry dock which will cost about $1,250,000 to construct. The Dominion Government has agreed to bonus the new dock to the extent of 3½ per cent. on its cost for 25 years. The lifting capacity of the structure will be 15,000 tons. The operating company wlil also have a ship repair and construction works and car shops, which will cost about $500,000. This department will not share in the bonus.

The authorities of Victoria are endeavoring to arrive at the actual cost of producing power for street lighting purposes. There is a strong impression that when the B. C. Electric Railway plant at Jordan river is completed it will be possible to purchase from the company 1,000 h.p. daily at about one-half the cost at which the city can produce its own power.

What is claimed to be the biggest gypsum deposit in the world has been discovered near Kamloops. A Vancouver company is likely to undertake the development work, in connection with another big scheme for the irrigation of a large area of land in the vicinity.

The city council of Victoria is experimenting with calcium chloride as a layer of dust. Ten tons will be used on the leading thoroughfares.

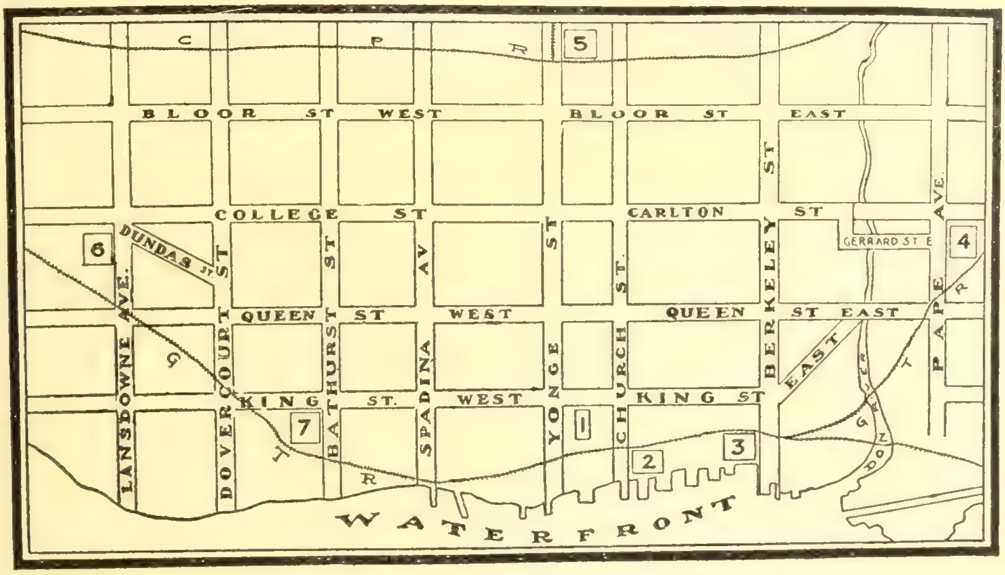
Vancouver spent over $70,000 in the construction of new sewers during the month of June. The whole appropriation for sewers will at the present rate be expended in about three months.

The death occurred last week of Mr. Samuel Adams, one of Ottawa's best known building contractors. The late Mr. Adams was born in Armagh county, Ireland, in 1849.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5



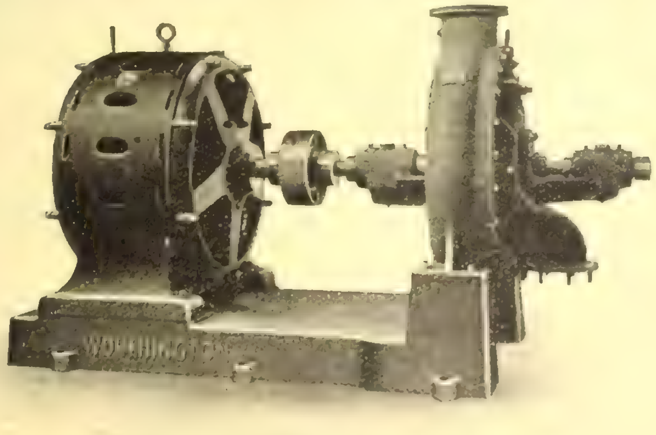
No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is

PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

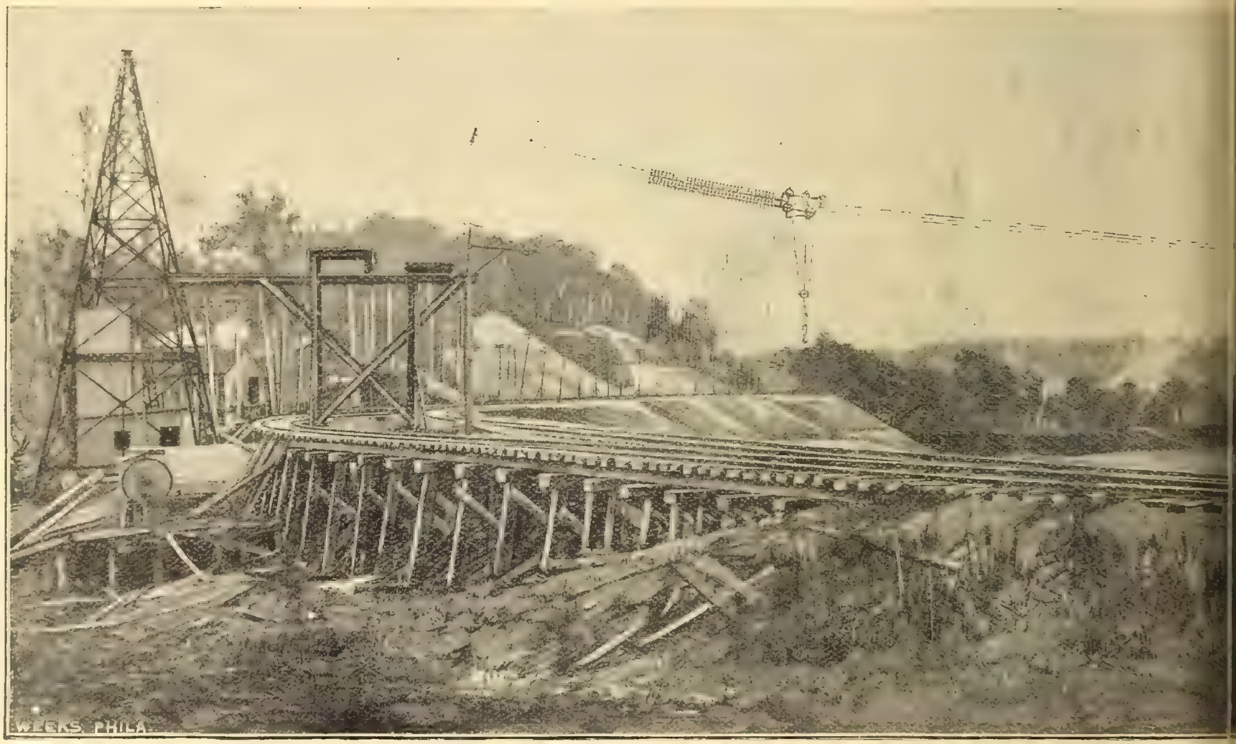
SEND FOR DESCRIPTIVE LITERATURE

WORKS 512 WILLIAM STREET MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

CABLEWAY



Flory Cableway Installed by us

Let us know the nature of

submit a propos

Head Offices and Warehouses :
Montreal

MUSSEN

or all purposes

alls, P. Q. for Transporting Logs

ork and we will be glad to
your consideration

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co. Limited

Hamilton - Canada

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS for Reinforcing Concrete

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto August 31, 1910 No. 35

A Superabundance of Red Tape

The case is reported of a contractor who, between June 1st and the third week in August, executed $11,000 worth of work for the city of Toronto and was only paid $300 on account. From inquiries made we can only conclude that this is a somewhat extraordinary experience and that instances of this kind are not common in contracting circles. At the same time there seems to be a greater supply of red tape in civic quarters than is demanded by common sense requirements. The average contractor is no modern Croesus, and aldermen and city councillors should know that the contractor's greatest problem as a rule is the financial end of the work. The contractor has to meet big bills for labor and material and is entitled to the closest co-operation in regard to prompt payment. It seems to be a somewhat unreasonable precaution to demand that the entire work be completed and approved before the deposit is returned or any payment made. In many cases it would be more equitable to allow payment for a proportion of the work executed or at least for the material put into the job. Why a paving contractor, for instance, should not have a cheque on account upon the delivery of, say, 50,000 approved brick is hard to understand. Such material is always worth its price and the city would be on the right side in paying for it. Probably a little discretion would have to be used in such matters, but certainly the point is a good one. It is all very well for our city councillors to insist upon every precautionary measure under the sun, and so earn a reputation for shrewdness and business acumen among their too often misguided constituents, but it is another matter to reflect that too much stringency of this kind means re tion. Ask many a good firm why it is municipal and public works, and what a "Too much red tape."

Failures of Roof Tanks

Failures of roof tanks, which have been altogether too numerous during the past year, have brought out a great deal of discussion concerning the strength of supporting walls and columns. It is to be hoped that the agitation will result in more careful designs for new tank supports and in examinations of existing construction with a view of strengthening that found to be weak, says the "Engineering Record." There is one point relating to designs of tank supports that seems to have received no consideration in the discussion and it is of such importance that some attention should be given it. Roof tanks are frequently set on two I beams and in the design of these beams the effect of insufficient lateral support for the upper flange appears to be commonly overlooked. For example, if the beams have a span of 35 feet, a top flange width of 7 inches and no transverse bracing is provided, the ratio between the unsupported length and the width of the compression flange is 60, which, according to best practice, would require an allowable unit stress of only one-half that permissible with flanges properly braced. In other words, if the section modulus is determined by an average unit stress of 16,000 pounds per square inch, which is frequently employed, the maximum fibre stress in the compression flange will be very much greater. In fact, the maximum unit stress may be so great as to be dangerous; especially so since wind pressure causes additional forces to act on the beam in a direction in which it is weakest. Obviously, the beams should be connected by lateral bracing so that the ratio of unsupported length to width of flange will not exceed 20

Irregularities in Municipal Circles

Irregularities, and rumors of such, are heard in all municipal circles from time to time, but the palm for this sort of thing must be awarded to Montreal. It was discovered in that city last week that Nolan street, apparently the property of the C.P.R., had been macadamized at a cost of $20,000 by the authority of someone unknown. The following extract is word for word from the Montreal press:

"The controllers have questioned Mr. Barlow, city surveyor, and he has informed them that the street does not belong to the city. Who had given orders to have it paved he could not say. Certainly he had not. He had not even known the macadam was laid.

"Mr. Howard, assistant surveyor, was also questioned, but was unable to throw any light on the strange circumstance."

The expenditure of $20,000 upon a doubtful job, by a nameless firm, upon unknown authority, is a "strange circumstance." Ye gods!

Science of Economy in Municipal Service

Amount of Improvement made in Recent Years not Altogether Satisfactory—Little Advance in Water Purification and other Departments

Although scientific study of the purification of water was some years ago considered to be in advance of that of sewage, there appears to have been a failure during a period of several years to introduce any new methods or any improvements except some minor ones in construction details of filters. It was for some years held that slow sand filters were the only practical means of purifying water for potable purposes. Several years ago it was demonstrated that rapid sand filters were of great value in removing suspended matter, and also that a high degree of bacterial purification could be obtained by them. Further advance lagged, however, except for the introduction of preliminary treatment by means of prefilters and sedimentation—an important improvement in the art.

Within the last two or three years there have been developed to a physically and commercially practical point and recognized as scientifically sound several methods of treating water for the destruction of bacteria and other vegetable and animal growths, such as the use of copper sulphate of algæ, and bleaching powder and ozone for bacteria. In spite of the apparent failure of ozone treatment at Lindsay, this failure—if such it is—is probably one of mechanical details only, and there is now no dispute of the fact that ozone is theoretically one of the best means of destroying bacteria, although much yet remains to be done in the way of perfecting mechanical details and decreasing cost.

When slow sand filtration was the only recognized method of purifying water for a potable supply the only question to be settled was whether there was sufficient necessity for purification to warrant the expense of such filters, the difference in structural features between two plants being frequently such as to be noticed only by the expert, in many cases determined by the preference of the engineer rather than any scientific reasons therefor. Now, however, the matter is much more complicated, and not only efficiency, but economy, demand that the design of a purification plant be placed in the hands of one who is absolutely up-to-date in his knowledge of what has been found and proven concerning the various methods and devices of water purification.

How many and what of the several methods available it is desirable to adopt will depend to a very great extent upon the character of the water, and to a perhaps less extent upon the uses to which it is to be put. Suspended matter may be removed by plain sedimentation, coagulation, or roughing filters. Finer suspended matter not susceptible to economical removal by these methods can be removed by either mechanical or slow sand filters. Bacteria can be destroyed by hypochlorites, ozone, etc., or by sand filters; the water can be softened by plants adapted to that purpose; iron can be removed by oxidation and filtration, and in general any objectionable animal, vegetable or mineral substances can be removed or neutralized by physical, chemical or biological treatment.

While double or triple treatment of sewage and of water is now practically recognized as being in many cases not only the most effective, but the most economical also, apparently little has been done toward introducing multiple treatment in street cleaning, if we except the practice common in some cities of going over the business streets with a horse-drawn sweeper during the night and keeping the white wings busy throughout the day over much of the same area. Inventors are busy, however, with all sorts of mechanical devices for removing street dust and dirt. The horse-sweeper is objected to because it does not clean the dirt out of the joints between blocks, does not get down into holes and depressions in the pavement, etc. Pneumatic or suction machines which draw up into bags or other receptacles the dirt swept from the pavement would seem to be almost ideal, but they do not handle wet or damp dirt successfully, and most of those so far constructed have been heavy to draw and expensive both to construct and operate Flushing gives clean streets, but is seriously objected to by the sewer department in many cities because of the amount of dirt washed into sewers.

The manufacturer of each appliance very naturally argues that his machine is the best under all circumstances. It suggests itself to us that here, also, multiple treatment may yet prove to be the most economical. If flushing machines do wash too much dirt into the sewers, let us confine their services to that in which they particularly excel—the removing of slime and of dirt from joints and depressions—and remove dry dirt and that upon the general surface of the pavement by means of the ordinary horse brooms or pneumatic sweepers. As these machines are at present designed this would apparently mean double expense, but if it were understood that each was to be confined to the services above suggested we believe that the cost and speed of operation might both be improved, and it certainly seems probable that the efficiency would be. This is a suggestion of but one combination of several which should be possible with known appliances and methods, and with the demand for others and a scientific study of conditions we do not doubt that new and improved ones will be devised.—Municipal Journal and Engineer.

Failure of a Cast Iron Column Connection

The small five-storey commercial building at the corner of Park Place and West Broadway, New York, had iron or steel floor beams supported on the long street front by cast iron columns, of which two intermediate ones were cylindrical with diameters of about 10 inches, and those at the corners had rectangular cross sections. Recently the upper floors suddenly settled about 3 inches and the walls were badly cracked and sprung, but the building did not wholly collapse and no lives were lost. An examination was immediately made and the building was found to be unsafe and its removal was ordered.

It was at first believed that the trouble might be due to the settlement of the column foundations, which had perhaps been undermined by leakage from pipe mains in the adjacent streets. When the brickwork and superstructure were removed the foundations and the lower sections of the column were found intact and not displaced, and the wall girders were in inclined positions, with the ends at the corners of the building at the original elevation and the opposite ends, over the intermediate columns, depressed about 15 inches, but still seated on their cast iron connections.

The connections consisted of square cast iron bearing plates about 3 inches thick, which received the lower flanges of the I-beams and were seated on the upper surface of hollow bottomless cubical cast iron boxes about 15 inches high, with metal about 1 inch thick. These boxes had telescoped down over the tops of the two intermediate cylindrical wall columns, the latter bearing against the under sides of the tops of the boxes. One vertical side of each box had broken off, showing the apparently uninjured column top inside the box. Small pieces of lugs remained attached to single small bolts passing through each column a little below its upper end and were at first thought to have been connections transmitting the load from the box to the columns, but from their dimensions and position it was afterward concluded that this was not the case and that they might have served as connections for the framing of the store front or for transverse connections.

In the absence of any drawings or other data of the original constructions, and on account of the confusion and loss of some materials in the accident and subsequent wreckage, it is so far impossible to say positively what was the exact detail of connection between the top of the column and the superimposed hollow box, but the obvious and extremely probable construction was that of a cast iron bearing plate centered on the square flangeless top of the column and receiving on its upper surface the lower edges of the hollow box. Such a connection is entirely consonant with the details at the top of the box and with the fact that there is no evidence of any other connection, as would certainly have been the case had there been a steel or wrought iron bottom plate. In the latter case it is not likely that the plate would have suddenly failed after several years' service, and if it had failed it could not have disappeared, while the cast iron plates might fail at any time and might break into several pieces, all of which could easily be lost in the wreckage. It is thought, however, that when the lower sections of columns are removed small pieces of the cast iron plates may be found in their interior.

As West Broadway was considerably widened a few years ago and a number of the buildings had new fronts put in them, at this time it is quite possible that such was the case with this building and that in the reconstruction the original cast iron columns were found too short and were extended by the insertion of the hollow boxes between the first and second storeys, thus affording a cheap and convenient means of utilizing them.

A remarkable feature is that the cast iron columns themselves should have endured the impact of the upper part of the building falling several inches and should have arrested the movement of the floors and masonry after it had been fairly commenced. The escape from total collapse doubtless prevented a serious loss of life.

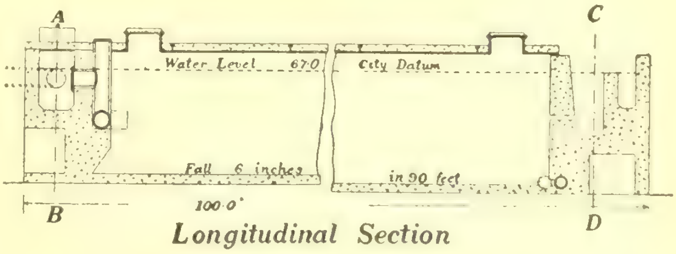
The square columns at the corners had full direct bearing and no failure occurred at them.—Engineering Record.

Two miles of concrete poles have been recently erected by the Auburn Mutual Light & Power Company as an experiment, more to determine the cost of erection and planting than anything else, for the success of poles of this character is practically assured. The poles range from 38 to 60 feet in length and are of octagonal shape, reinforced with four rods. The cross trees are of galvanized metal. The 40-foot pole contains about [illegible] pounds of metal and four sacks of cement, and weighs from 2,800 to 3,000 pounds. The average cost of the pole ready to set was $7.65 and the cost of setting amounted to $3.30. These figures are somewhat lower than shown by the experience of other companies.

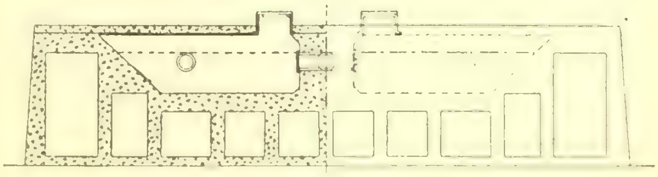
Septic Tanks in Ottawa

What is known as the south drainage system of Ottawa was constructed in 1909, although considerable remained to be done to the system during the present year. This system, in which are used reinforced concrete, brick and tile sewers, drains an area of 150 acres with an outlet into the Rideau river. As the provincial authorities would not allow untreated house sewage to be discharged into the river it was decided to provide septic tanks, and construction on these was begun Sept. 1, 1909.

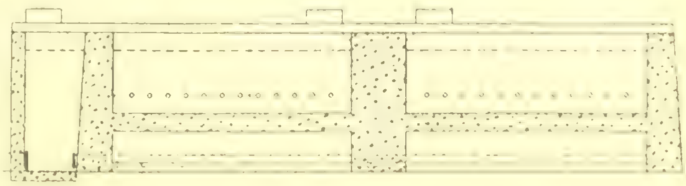
Slow progress was made at first with the excavation, as water was found one foot below the surface of the ground, necessitating continuous pumping to allow the men to work. The tanks are 90 feet long, 14 feet wide and have an average depth of 7 feet, with a grit chamber at one end and an aerating weir and effluent channel at the other. The tanks were constructed entirely of concrete, the mixture being 1 cement, 3 of sand and 6 of stone. For the reinforcement of the roof standard 56-pound railroad rails were used as cross-beams, the intermediate spans being reinforced with expanded metal. The general construction of the tanks is shown in the accompanying sections.



Longitudinal Section



Section Through A--B



Section Through C--D

Sections of Ottawa Septic Tanks

Access to the tanks is obtained by six standard manholes. As the sewers are on the combined system, a storm overflow is provided, 24-inch vitrified pipe being used, which extends to the Rideau river, at the bank of which it is continued by a 24-inch steel pipe which extends into the river for a distance of 120 feet and discharges through an outlet 12 feet below the surface of the water. The construction of the tanks was completed about the first of December.

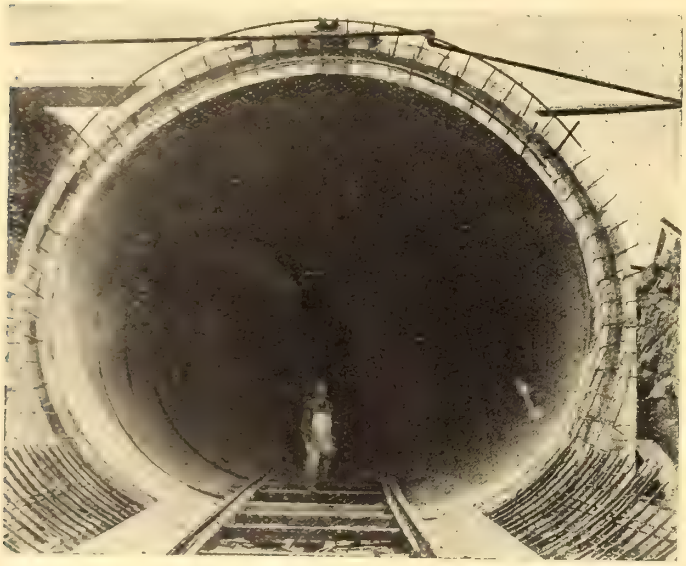
There is a scarcity of bricklayers at Brandon, Man where it is reported that one employer has been offering 75 cents an hour for men. The supply of labor generally is far short of the demand.

An 18-foot Reinforced Concrete Conduit

The new 18-foot reinforced concrete conduit of the Ontario Power Company in Queen Victoria Park, at Niagara Falls, is of much interest as it is the first example of the application of reinforced concrete to pressure pipe construction of anything like this magnitude anywhere in the world. Although the conduit is completed and ready for service, it has still to be covered, by the refilling of the trench in which it is laid On the completion of this work the surface of the park will appear as usual, the conduit being entirely concealed.

The conduit, which has an effective internal diameter of 18 feet, is 6,300 feet long, connecting the company's headworks at Dufferin islands with its distributor just below Table Rock. Its walls have a thickness of 18 inches, and are composed of reinforced concrete, both longitudinal and circumferential bars being used. It is of oblate form, the flattening being more pronounced on the bottom than on the top, this form being used for both engineering and economic reasons. It rests throughout its length on a concrete foundation.

An interesting feature of the work is the fact that all the materials used have been of Canadian origin or manufacture, the cement and the steel having been purchased from two of the power company's own customers, the Canadian Portland Cement Company and the Ontario Iron & Steel Company.


The 18-foot Reinforced Concrete Conduit of the Ontario Power Company.

The primary purpose of this conduit, which is the second the company has constructed (the former being of steel), is in connection with the extensions which are now in progress in the company's generating station. It is connected, however, by by-passes, with the first conduit so that a portion of its power is immediately available through the apparatus already in operation.

Capacity of the Horse

Some interesting data relative to the working capacity of the horse is given in a comparison between the horse and the gas traction engine made in a paper read by Mr. L. W. Ellis at the annual meeting of the Gas and Gasoline Engine Association. Mr. Ellis says:

Endurance is the horse's weakest point. Ten hours a day is often assumed as his working period. Authorities claim that eight hours is better, or that six under a heavier load will accomplish to same volume of work, with less tear and wear on the horse. The average farm horse cannot be depended upon for more than 13 to 15 miles of pull a day, nor more than four to six hours of work per day, as an average of even the busiest months.

Properly handled, working about six hours a day, well and carefully fed, a horse may have a working life of ten years of 1,000 hours each. The average farm horse will do well to develop 500 horse power hours per year or 5,000 in ten years.

About 20 per cent. of the horse's weight may be taken as his maximum sustained draft, and six to eight miles per hour his maximum sustained speed for anything more than an hour or so per day. The draft horse ordinarily gives the largest volume of work per day at about one-half his maximum load, and one-third his maximum speed.

One reason for the great flexibility of the horse is the fact that he works most economically at about 1 pound of draft for 10 pounds of weight, or from 50 to 20 per cent. of the rate he can exert in a pinch.

Cost of Sewer Construction by Day Labor

The cost of day labor work in the sewer division of the Boston street department is illustrated, in one of the reports of Messrs. Metcalf & Eddy to the Boston Finance Commission, by force account records which are compared with estimates of what the work might reasonably have cost had it been performed by contract. Portions of work in three separate districts were studied, and although the results show an increase of efficiency in 1908 over 1907 of about 25 per cent., the work done in 1908 cost about 36 per cent. more than the reasonable estimate of cost contained in the report. Messrs. Metcalf & Eddy conclude that the cost of the work done by the city by day labor, therefore, is from one-third to one-half greater than it would be under contract work.

One of the comparisons is for two pieces of work in the Dorchester district, one at Talbot avenue and the other at Oakland Brook. The Talbot avenue sewer included 1,458 feet of trench, 1,372 feet of structure; the depth of trench varied from 12 to 27 feet, and averaged 17.3 feet. There were in all 4,785 cubic yards earth excavation, 2,932 cubic yards rock excavation, 1,372 lineal feet of brick work, requiring 210,362 brick. The costs of this work as actually performed and the costs estimated by Messrs. Metcalf & Eddy are given in table 1

Table 1—Talbot avenue Sewer—Day labor and estimated contract costs.

	Cost per ft. of Trench.		Unit costs per cu. yd.	
Item	Actual	Estimated	Actual	Estimated
Excavation, earth	$13.52	$ 5.28	$ 4.30	$ 1.67
Excavation, rock	8.84	11.40	4.45	5.75
Carting away surplus ..	2.19	0.49	1.28	0.29
Brick work	5.48	4.73	21.50	18.50
Concrete	1.79	2.40	7.20	9.70
8-inch underdrain	0.43	0.88	0.42*	0.88*
Total	$32.25	$25.18		

*Per lineal foot.

The estimated cost given in table 1 includes 15 per cent. to cover contingencies and 15 per cent. profit. The actual cost of the job was $46,352 and the estimated cost $36,016; the excess being about 28 per cent.

During 1907 the same gang which was employed on the Talbot avenue work in 1908, built a conduit 8½ x 5¼ feet on a concrete foundation. This job cost $28,650 or $43 per linear foot, or about 45 per cent. more than Messrs. Metcalf & Eddy's estimate of $29.50 per linear foot. On the Talbot avenue sewer the report states that the excessive cost of earth excavation exhibits the inefficiency of the labor forces due to lack of discipline, foresight, and business management on the part of those in charge.

In the South Boston district a sewer was built in First street during 1908, the trench being 19.3 feet deep and 7 feet wide. The cost per foot for 190 feet of this work on which force account was kept was $41.29. For purposes of comparison Messrs. Metcalf & Eddy present the unit costs given in table 2.

Table 2.—First Street Sewer.

Item	Cost per cu. yd. Actual	Cost per cu. yd. Estimated
Earth excavation	$ 4.10	$ 2.14
Concrete	11.73	11.20
Brick	28.85	21.00
Underdrain	0.18*	0.47*

---

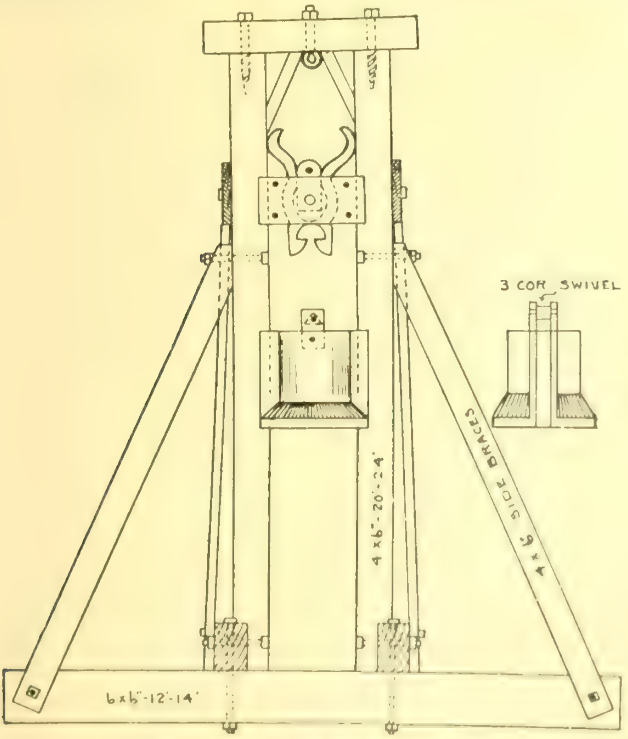
*Per linear foot.

In the West Roxbury district a 7-foot circular concrete conduit with a 4-inch brick invert for a portion of its length was built during 1908; this work cost $34.90 per foot as against Messrs. Metcalf & Eddy's estimated cost of $30.05. The length of structure was 1,137 feet.

The conclusions which Messrs. Metcalf & Eddy draw from the data which they present are that sewer construction by day labor in Boston is not economical. They recommend, therefore, the discontinuance of day labor in favor of contract work.

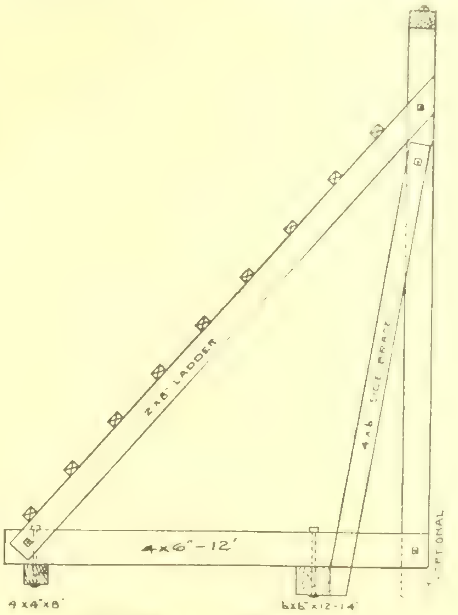
How to Make a Pile Driver

The cut of the driver is not to scale, but as dimensions are given, I trust it will do to build from. One like it was built right on the place where used, in fact, they must be, unless "taken down" for transport. The size of uprights depends on width of slide in hammer; this one used a 4 by 6 inch. I was told the hammer weighed 900 pounds. The bolts must be flush, so as not to interfere with hammer and snatch-block. Uprights should be straight and set just far enough apart to let hammer slide easily. The side braces, 4 by 6 inch, keep uprights from springing sidewise. The top plate may be fastened by using lag screws or by boring in a bolt and nut. The loop or eye-bolt at centre is for pulley, which should come as near top as possible to make sure that snatch-block trips, and these parts must be strong if the hammer is heavy.



Front View of Pile Driver.

The snatch-block is made of two pieces, best of hard wood for wear; is bolted together and must slide very easily. The jaws are not easy to make, because they have to be made of half thickness in centre, so as to be straight for each other above and below block. The clevis in centre is of flat iron and is outside of jaws, but inside of block, using same bolt.



Side View of Pile Driver.

The trip braces need not be heavy, 2 by 4's laid flat at a steep pitch are all right.

The 6 by 6 foundation timber, 12 or 14 feet long, is set back a couple of feet or so, to allow room for hammer, and to this the side braces are fastened. The 4 by 6-inch cross timbers, 12 feet long, are gained into uprights at bottom (or if you prefer the uprights to reach down more, then make the gain accordingly; but such ends might be in the way, too, if long). Then bolt on the 4 by 6 cross timbers square out from 6 by 6 foundation timber; centre the 4 by 6-inch foundation timber, 8 feet long, and bolt at outer end, leaving ends of 4 by 6 to project to each side. The ladder part is of 2 by 8's with 2 by 4-inch rungs set about 16 inches apart, nailed on.—A. O. Stein.

The waterworks of Vienna, which have been under construction for about ten years, are now nearly completed. Supplies are derived from mountain springs and brought to the city by an aqueduct, 113 miles long, built mainly of concrete and measuring 6 feet 10½ inches high by 6 feet 3 inches wide. Numerous tunnels have been driven on the line of the conduit, one of them at Gostling being 3⅓ miles long, while the total length of the tunnels aggregates nearly 53½ miles. As a general rule, valleys have been crossed by syphons with a collective length of 13 miles, but there are also about 100 bridges accounting for some [illegible] miles of the aqueduct. The new aqueduct will bring into Vienna an auxiliary supply of more than 50,000,000 imperial gallons daily; the yield from the existing works ranges from 35,000,000 to 26,000,000 imperial gallons a day.

Data on Estimating Labor and Material

Excavators', Bricklayers' and Masons' Quantities—Some Practical Directions Relating to Their Measurement—Tabulating the Work

The detailed dimensions are first of all "taken off" the drawings, and written down in columns, in the order of the length, breadth and depth, with an abbreviated description of the work to which the dimensions refer. When this has been done the next operation is "squaring the dimensions," to obtain either the cube or superficial measurements resulting from each set of dimensions. These results are collected together in the "abstract" for each trade; the total "collections" in each abstract are then placed in their proper order in a "bill of quantities"; the bill is ruled so that a price and a total may be placed against each item; the sum of all the totals will give the total proposed cost of all the work mentioned and described in the bill of quantities. This is termed the "estimate."

The following are some general notes relating to the measurement of the various items of labor and material, under the proper trade headings:

Excavators' Work

General digging, at per yard cube. Beyond 6 feet deep, keep separate and divide into stages of 6 feet each; wheeling over 20 yards keep separate, and divide into runs of 20 yards each; basketing out, keep separate, if no concrete take digging 6 inches wider than base of footing; describe if dig and cart away; dig, wheel, and spread, or if dig and part fill in and ram. In trenches the space occupied by the concrete and wall is dig and cart or dig, wheel, and spread. The remaining space is dig, fill in, and ram.

Concrete at per yard cube generally; if under 12 inches deep at per yard superficial. State proportions of materials to be used if in lime or cement, etc.

Wells, at per yard cube, stating diameter, depth, distance to be removed and description of soil.

Surface digging, at per yard superficial, if 12 inches deep or under.

Spread and level, at per yard superficial, with description of average depth.

Hard brick rubbish, at per yard superficial, if 12 inches deep or under; above, at per yard cube.

Clay puddle at per yard super, describing thickness.

Shoring, strutting, and planking at per foot super, to trenches under 6 feet wide at per foot run.

Drains at per foot run, to include digging, laying, jointing, concreting, filling, and ramming. Take a running dimension over all pipes and connections. When the latter are taken they are charged as extra only upon the cost of this item. State size of pipe, with description, how jointed and enclosed, and the average depth of the trench.

Length of drain upon which there is any additional labor should be kept separate and so described, such as "deep digging," "tunneling," "strutting to trench," etc.

Bends, junctions, traps and gulleys are numbered, and having been measured in the length of the drain are described as "extra only" upon the cost of the drain. Manholes are numbered and described.

Piles are numbered. State size and description of timber and length to be driven.

Number the rings, shoes, pointing, and cutting off heads when driven; state weight of ironwork.

Memoranda—The following is the ratio of the increase in bulk of the undermentioned earths when excavated:

Earth and clay	about ¼
Sand and gravel	about 1/12
Chalk	about ⅓ to ½
Rock	about ½ to ⅘

In the mixing of concrete the bulk is about two-thirds of the volume of dry materials before mixing; for instance, a cubic yard of concrete in situ requires about 1½ cubic yards of cement, gravel and sand.

Bricklayers' Work

Brickwork, where used in large masses as for engineering works, is sometimes measured per foot cube. The usual method is as below:

The following is measured superficially:

Brickwork in mortar, at per rod of 272 superficial feet, 1½ bricks thick, all thicknesses to be reduced to this standard.

All half-brick walls are measured similarly but priced separately.

Brickwork in cement, measured as above, but usually included in the brickwork in mortar, and described again separately as "extra only in cement."

Keep all above 50 feet from the ground separate, only all built in small pieces.

Facings are measured at per foot superficial, as "extra only" upon the cost of the general brickwork, allow 3 inches below the ground and 3 inches at junction of roof with gable wall.

Fair face and point, at per yard superficial, where the same kind of bricks are used in face and body of wall.

Fair and rough cutting all over 6 inches wide at per foot super.

Damp course at per foot superficial.

Arches in walls in lime mortar are measured in with the ordinary brickwork. Rough arches in cement, axed or gauged arches, are described and charged as "extra only" upon common brickwork; all extra necessary labor and material above those required in the common brickwork are charged for in all arches, such as fair or rough cutting, turning pieces, etc.

Trimmer arches and vaulting at per foot super, describing and stating thickness.

The following work is all measured by the superficial yard: Brick paving, brick nogging, rough rendering, cement floated face, cement or tar paving, asphalt paving, and tiling on brick.

The following is measured per foot run:

Fair and rough cutting, if under 6 inches wide.

Birdsmouth, squint quoin, cutting and pinning.

Chase for pipes, cutting, toothing, splays, chamfers.

Cement fillet, lime and hair filleting, joints or groined arches, rake and point flashings.

All the following to be numbered, with a proper description: Mitres and stopped ends of cornices, strings, etc., bedding and pointing door and window frames; flues, parge, and core, stating average length; ends of sills cut and pinned, holes cut for pipes, coppers, and settings; all stoves and setting; chimney pieces and fixing; brick seatings to W.C. traps, trimmer arches leveled up for hearths, rendering chimney backs in cement, air bricks and fixing.

Memoranda—To reduce cubic feet of brickwork to rods, $1\frac{1}{2}$ bricks thick, deduct 1/9, and divide by 272.

Facing requires about 7 bricks per foot superficial; a rod of brickwork with a $\frac{3}{8}$-inch joint requires 4,356 bricks and 3 1/30 cubic yards of mortar. Allowing for waste and consolidation this will mean 4,500 bricks, $1\frac{1}{2}$ yards of lime, and 3 yards of sand, or 4,500 bricks, 1 yard of stone lime, and $3\frac{1}{2}$ yards of sand, or 36 bushels of cement and 36 of sand to bricks as before, or 30 bushels of blue lias lime to 60 bushels of sand. A ton of Portland cement is 11 sacks. There are 21.09 striked bushels to 1 yard, 30 bushels of lump to 1 ton of quicklime, 26.6 bushels of ground lime to 1 ton of quicklime.

In the mixing of lime and cement mortars of the usual proportions the final volume may be taken as about two-thirds of the volume of the dry materials before mixing, as may be deduced from the quantities for 3 1/30 cubic yards of mortar required for a rod of brickwork.

A striked bushel equals 1.28 cubic feet; therefore a cubic yard equals 21.09 striked bushels.

Masons' Work

Take all stone at per foot cub including hoisting and setting. If the hoisting is over 40 feet in height, take an extra to, and divide into heights of 20 feet, as 40 feet to 60 feet, 60 feet to 80 feet, etc.

All labors to be taken separately and to be measured at per foot super. The final labors include all preparatory labors.

Half Sawing or Haif Plain—This labor is taken to all faces upon which no other labor is taken, such as the back of ashlar work, the back of a cornice, etc.—National Builder.

Bituminous surfaces, according to the experience of the Massachusetts State Highway Commission, as set forth in its last annual report, should have less crown than the ordinary macadam road. While the customary crown on macadam roads is $\frac{3}{4}$-inch to the foot, a crown of $\frac{3}{8}$-inch or less has been found to be probably sufficient and possibly more desirable than a greater crown on bituminous surfaces. Experience has also shown that with both automobile and horse traffic on a bituminous road it is advantageous, particularly with roads made by mixing or grouting tar in the top course, to apply a surface sealing coat, preferably of asphalt, as that seems somewhat less slippery, gives a better appearance, and, at present writing, shows indications of longer life than a surface coating of tar.

Flat bundles of empty cement sacks suffer greater damage and cause more trouble in shipment that do the rolled bundles, according to the Universal Portland Cement Company. Flat bundles are not stiff enough to hold their shape when stood on end, and the ropes with which they are bound slip off easily, with the attendant loss of sacks from the packages. The advantage of tying the sacks in rolled bundles is that the resulting package is stiff and compact and can be handled in parctically the same way as a log of wood.

Incorporation has been applied for by a company which proposes to establish large cement works near Princeton, B.C. It is stated that the plant will involve an expenditure of $250,000. Its initial capacity will be 1,000 barrels per day. L. W. Shatford, M.P.P.; John George, J. A. Harvey, K.C., and L. W. Stone are among those interested in the project.

Proposed Bank of Ottawa, Vancouver

On September 1st operations will be commenced at the southwest corner of Seymour and Hastings streets, Vancouver, for the new eight-storey building of the Bank of Ottawa The plans for this structure, which is to cost in the neighborhood of a quarter of a million dollars, have just been completed by Architect W. Marbury Somerville, 43 Exchange Building, Vancouver. The work will be finished by the end of May, 1911, and the building is expected to be ready for occupancy early in June next.

The plans call for ground floor space 52 feet by 120 feet, the base to be of granite and stone, with brick and stone trimmings above on reinforced concrete. The whole will be absolutely fireproof. There will be 16 offices to the floor, with the exception of that on the street level, which will be occupied by the owners, the Bank of Ottawa, for banking premises. On this floor also will be the elevators leading to the upper storeys. The entrance to the vestibule and lobby will be handsomely done in marble, while the floors above will be trimmed throughout in birch and finished with mahogony.

The 8-storey building to be erected at Vancouver by the Bank of Ottawa.

Other features of this latest addition to Vancouver's tall buildings will be a vacuum heating system throughout, hot and cold water in all the offices, the Durham plumbing system, mail chute equipment, vacuum cleaning system for all the offices, and commodious toilet rooms on every floor.

O'Brien, Fowler & McDougall, contractors on the Transcontinental, have removed their headquarters from Fort William to Lake Superior Junction.

Construction of the Hollow Core Fill Dam

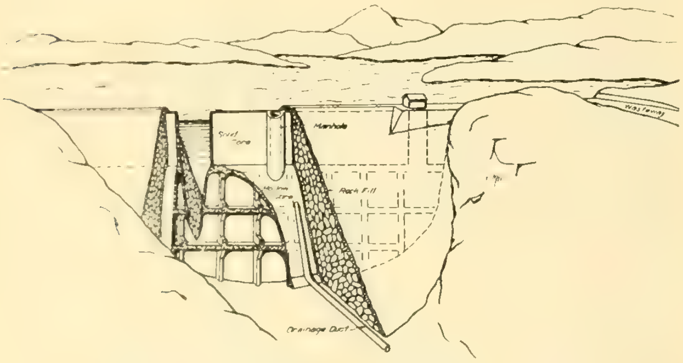
A Type which Increases the Practicability of these Structures—Its Several Advantages and Special Applications*

By Frank R. Gilbreth

The salient features of a fill dam as a type are: its range of adaptability, the utilization of available materials and the ease and economy of construction. Any new features which add to the advantages of this important class of dams are worthy of consideration.

The centre core-wall type of fill dam is the one in most general favor, due in part to the ease and economy of construction, notwithstanding the fact that the weight of the reservoir fill is partly lost through submergence. Solid centre core-walls have been constructed of generous dimensions which were expected to provide ample provision against leakage and, regardless of this fact, leakage too frequently does occur.

In localities where the run-off for water supply is scarce or intermittent, any leakage through a reservoir dam, however small, is a serious one in loss of revenue. When leakage does occur through a solid core fill dam, the location of the leak cannot be definitely determined for the position of the fill which covers the core of the dam makes that part of the dam inaccessible and the means for repair are slight and an expense which at the time is too great to warrant immediate attention.



Fill Dam with Hollow Concrete Core Wall

To meet this condition and to provide access to the vital portion of the dam there is designed a type, the hollow core fill dam, wherein the core is made hollow, that is, of two walls cross-braced with division walls with means for access to the interior of the core thus formed. This hollow feature permits of an inspection of the interior of the core and to the seal of the core along the foundation. By this method of construction the condition of the interior of the structure is always known and any defect can be definitely located, and if leakage does occur at the seals or through the core wall, repair of the defect is possible. The hollow feature can be constructed to any part of the height of the core wall, making the upper portion of the core solid and the lower portion hollow, thereby allowing access to that portion of the dam which is subjected to the greatest pressures, and resulting in a combined solid and hollow core-wall.

The small extra cost of hollow construction of the core is offset by the advantages of making the critical part of the dam open to inspection and repair and in addition thereto it has an increased strength and stability of core, due to the enlarged shape and greater base. The enlarged section of the core also reduces the amount of necessary fill without sacrificing any features of design, due to the resultant of force on the sloping reservoir face falling more within the base of the core.

The rear wall of the core is constructed to receive the rock pressure only which is transmitted to the reservoir wall, which in turn is designed for both strength and impermeability. The division walls crossing between the core walls are arranged so as to divide the interior into compartments which are provided with separate drainage to conduct any leakage away from the core and lower fill, and thereby avoid flooding of the interior of the core.

The increased size and shape of the hollow core is a feature in the strength of the dam for the materials are placed where they serve to the best of advantage as to the practicability of the entire structure.

In localities where the country is extremely arid the torrential run-off has been phenomenal and a present condition is not a criterion of possible conditions. Wasteways become blocked, and even with open bays and the counteracting effect of the reservoir above, with water near the high water level, a cloud burst or the failure from a reservoir above places all computations of possible discharge as nothing and any feature which adds to the strength and safety of this class of dams is to be desired. A dam is a structure which should be built for the life of the reservoir and scarcely any dam is constructed which does not have a community interest below it and this interest should be granted all the protection possible against disaster from failure of the dam.

In localities where the water supply is abundant the question of leakage, while not one of direct revenue, is one that should be avoided. In a reservoir fill dam a continual leakage is a detriment and in this type of dam only a bottle tight condition should be considered. Permissible leakages due to hydrostatic pressures do not apply to this class of dams.

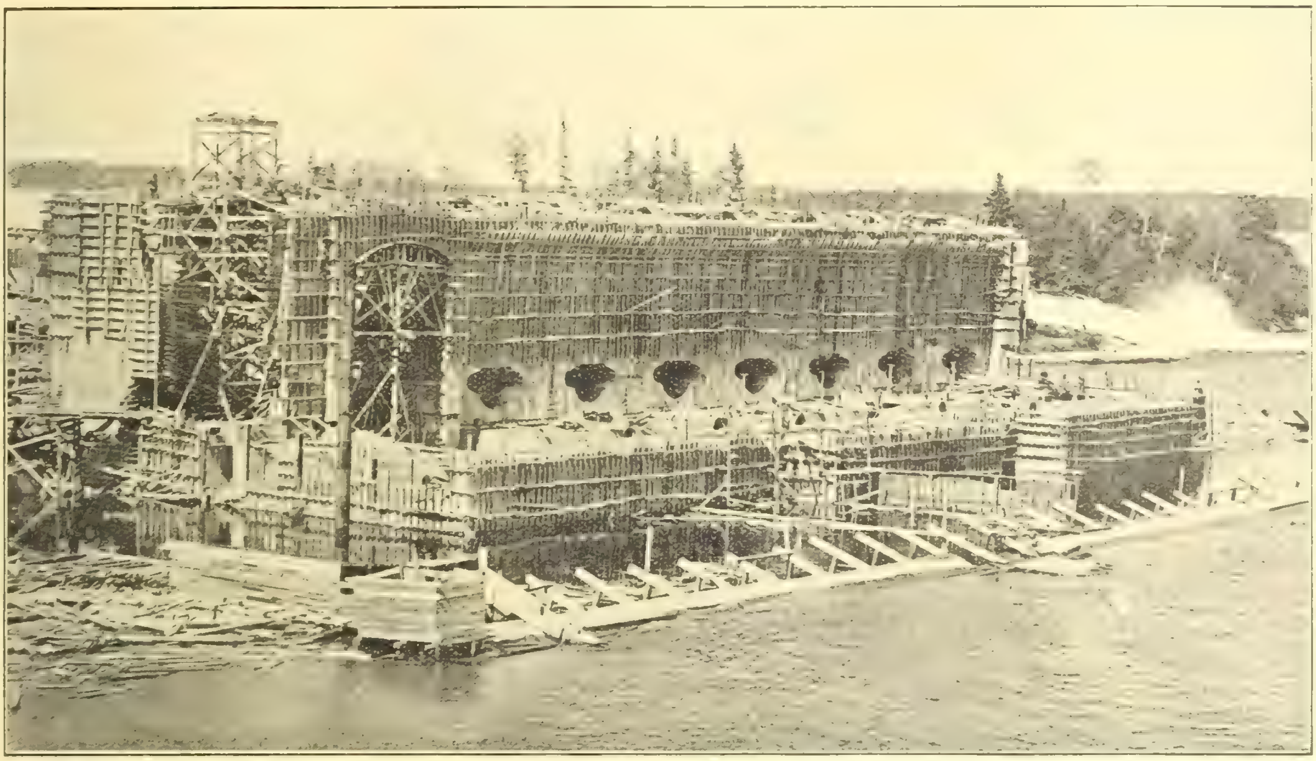
Fill dams have a wider range of application than any other type, being suited as an adjunct to a constructed overflow type, or where the foundations will not permit of a structure of great weight; where the materials of construction at hand are not suited to another type of dam; where the site is remote from transportation and when the feature of economy of construction is all important. These features make the fill dam more universal in application than any other type of dam and the hollow core fill dam increases the practicability of this important class of structures.

Unfilled Voids in Concrete Foundations

Unfilled voids in party wall caissons were recently discovered in the course of the erection of a 20-storey office building in Chicago. These caissons were constructed some years ago for another building. An examination showed that the outer 2-foot ring of one caisson contained hardly any cement, so that a man with no other tools than a hammer could dig a hole 2 feet deep into any side of the caisson without much trouble; in fact, broken stone fell out of the concrete on removal of the planking surrounding the pier. To fill these voids

---

*Reprinted from Engineering-Contracting.



First Section of Winnipeg's Municipal Power House at Point du Bois, where 60,000 H.P. will be Developed

in the caissons appeared at first a very difficult task, but was executed in the following manner, as described by the Engineering Record:

First, a 6-inch hole was drilled down to the top of the caisson bell, about 50 feet from the top of the caisson. A pipe was to be inserted in this hole, reaching nearly to the bottom; the top of the hole sealed around the pipe, the latter connected with pumps, and cement grout pumped in under pressure to fill the voids.

Two pumps had to be provided so as to ensure continuous work. In the work on the first hole it was found necessary to case the hole, as the drilling progressed, with a 6-inch pipe in order to prevent the loose material from falling in. This pipe was left in place. A two-way connection was made at the top leading to the two pumps, which were connected with a vertical receiving tank placed in the basement near them. Directly over this receiving tank on the first floor were placed two mixing tanks, in which were paddles operated by an engine for the purpose of keeping the mixture agitated at all times. The mixing was done in alternate tanks so as to provide a continuous supply. There were ten 8-foot caissons which needed this injection of cement to make them what they should have been in the first place, a solid homogeneous mass.

Basing the amount of cement required on the outer 2-foot ring of the caissons having 40 per cent. voids, it was estimated that 700 bags of cement would fill the voids. It took from 800 to 1,300 bags to accomplish the desired result in each caisson. The explanation of the use of more cement than was estimated may be either that the ring was more than 2 feet in some cases, or the bell as well as the shaft of the caisson contained a great many voids in some cases. Upon completion of this operation an examination was made of one of the piers down to a depth of 30 feet below the top of the pier, and all the voids were found to be completely filled with cement.

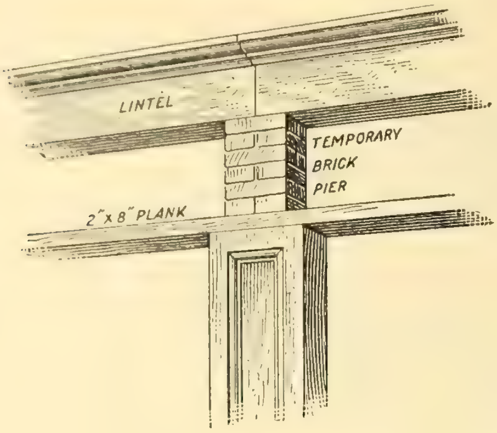
In conclusion it may be stated that these caissons had been executed by a reputable contractor under a percentage contract. It is, therefore, not likely that there had been any intentional slighting of the work or saving of cement. Giaver offers the following explanation as to how this defect could occur:

It is customary to use a pipe in filling caissons with concrete. It seems very likely in this case that the pipe was allowed to hang approximately in the middle of the caisson and that as the filling proceeded the pipe was shortened but not moved around so as to distribute the concrete at different parts of the pier. It is therefore, natural that a conical deposit would occur and that the grout would remain in the centre of this cone while the stone would roll to the outside. That this was the case was indicated by the examination, which showed, after going in about 2 feet, that in the centre of the caisson there was a very compact mass of concrete.

The Office of Public Roads, United States Department of Agriculture, in 1907 built an experimental road at Bowling Green, using rock asphalt as a binder and to fill in the voids of a fresh macadam surface. In a circular just issued it is stated that the road was inspected during the latter part of May, 1909. A heavy rain had been falling for some hours before the inspection was made, and there was more or less soft, sticky mud on the roads adjoining the experimental road. The surface of the rock asphalt was clean, smooth and compact, with no ruts, and had much the same appearance as a first-class asphalt city street. The thin surface course of rock asphalt has worn down in a few spots to the crushed stone, but the individual crushed stones were tightly bound together and not a single loose stone was found

Makeshifts in Building Construction

Sometimes it is necessary to make use of a temporary expedient when certain details are slow in coming on the job, and a case in point is illustrated by means of the accompanying sketch. As shown, the makeshift consists of a small brick pier intended to hold up the stone lintels or facias over window openings until the arrival on the job of the stone brackets, which rest on top of the stone mullions or separating columns. The sketch so fully tells the story that extended comment would seem to be unnecessary.



Temporary Brick Pier

Hints on Making Good Concrete

The water for mixing good concrete must be clean and entirely free from matters in suspension, says Mr. Spencer Sills in his paper read before the Institution of Municipal Engineers. Stagnant pond water is most unsuitable, as it is frequently swarming with animal and vegetable life and chemical impurities. Concrete requires about 25 per cent. to 30 per cent. water to form a homogeneous mixture, and the mass should be well turned dry until the whole is thoroughly mixed, and turned again quickly when wetted, several times, until of a uniform color. When deposited, the concrete should show just wet upon the surface. More water than this floods the cement, and washes it away from the aggregate, and less water does not allow of the full reaction of setting. If the aggregate is of a porous or absorbent nature, such as broken brick or stone, it should be well soaked before mixing; otherwise the aggregate will absorb water when deposited, and impair the setting operation, and in these circumstances it is quite possible to get a weak concrete, although using the full quantity of cement.

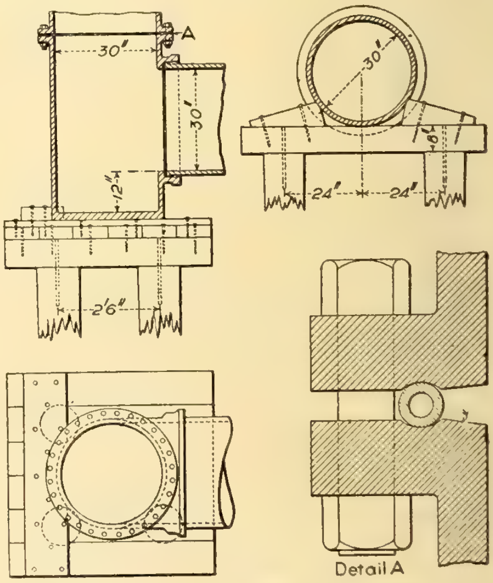
Accurately measured gauges for apportioning quantities upon the works is of the greatest importance, and their intelligent use a matter for close supervision. The sometime method of filling the aggregate, gauge levelling up, and placing a bottomless cement gauge on the aggregate for filling, leaves too much to chance in the variation of the quantity of cement. A more accurate gauge for cement is a metal vessel, but undoubtedly the correct way is to apportion the cement by weight, taking 100 pounds weight as representing one cubic foot of sand voids.

The secret of success in concrete work lies in the knowledge of what to avoid, and may be briefly summarized as follows: Avoid an unknown cement, cement delivered in unbranded sacks or casks, or one of foreign manufacture. British made is good enough, and is branded. Avoid lumpy or caked cement. Avoid a quick setting cement. Avoid accepting the first aggregate to hand; choose the best obtainable for the purpose. Avoid the acceptance of an aggregate on sample; see it in bulk. Avoid the use of a natural aggregate without knowing its history, and insist upon screening and apportioning sand. Avoid muddy water or water of a decided coloring. Avoid slovenly methods of gauging and mixing. Avoid sloppy concrete or semi-dry mixtures. Avoid mixing quantities of concrete which cannot be immediately disposed of. Avoid the use of dead concrete. Avoid frost, and carefully protect finished work. Avoid laying concrete in water. Avoid heavy or long continued ramming. Avoid earth and rubbish falling upon and mixing with concrete. Avoid weak shuttering or sparse timbering. Avoid the removal of centering, shuttering, or timber until the work is hard. Avoid the temptation to generalize in specifying.

Laying a 30-Inch Pipe Line

A 30-inch pipe line was laid recently across the Pequonnock river at Bridgeport, Conn., at a point where the width of the stream was about 600 feet and the greatest depth below mean low water about 15 feet. There is a rise and fall of the tide amounting to about 6½ feet and it was required to locate the pipe line 23 feet clear below mean low water. On the shore ends of the line 30-inch risers were carried down vertically to grade and supported on four piles, driven to form a square and spaced 2½ feet on centres. The lowest section of the riser had a bell opening in its side to receive the spigot end of the pipe laid horizontally beneath the stream bed.

The method adopted in laying the line across the river consisted in placing the pipe in sections 48 feet long; each was made up of four 12-foot lengths, two bell and spigot pipes, one bell and flange and one spigot and flange. The connection between successive sections was made by bolting the two flanged ends together with 28 bolts and compressing a gasket of ⅝-inch AAA lead pipe between corresponding grooves in the faces of the abutting flanges, as shown in one of the accompanying drawings. The pipe was supported below the stream bed by a row of timber bents, composed of two piles and a cap; one bent was placed under every joint between successive lengths of pipe, which were prevented from rolling sideways by spiking to the cap two cleats made by sawing diagonally an 8 x 10 x 21-inch block.



Details of Submerged Pipe Line

The channel in which the piles were to be driven was first dredged by a dipper dredge to a depth of 20 feet below low water. The trench filled up rapidly so the piles were driven close behind the dredging, using an orange-peel bucket operated from a derrick boat to remove material which had slid into the excavation. Wooden bulkheads were put in the ends of the 48-foot sections of pipe, and air under a pressure of 20 pounds per square inch was pumped into each closed section to facilitate their handling by the derrick boat.

The bell and spigot joints were made at the surface by caulkers and the flanges between 48-foot sections were bolted together by divers.

Ceramic Tile for Floors and Walls

Without floors that act as a fireproof covering, there will be an increased danger of at least some damage to an otherwise fireproof structure, and it makes possible a further loss by a spread of the flames. While it is admitted that with hollow tile arches, there is not much cause for alarm from fire, even with the floor of lumber, yet it is undesirable from several other standpoints, as well as being a possible avenue to fire.

Durability and sanitation are of so much importance in the construction of modern buildings that where it is possible to have materials that possess these qualities as well as being fire resisters, they deserve consideration from all thinking architects and others who have any part in the construction of buildings. By actual proof, made ample by years of service, ceramic mosaic tile has demonstrated its superiority in the above respects over all other materials. As a fireproof, durable and sanitary floor material, ceramic tile has no equal.

There are many imitators, whose chief merit is in their low cost as compared with ceramic mosaic, but they are not sustaining this claim, because the cheapest structural commodity is always that which will prove durable, and by this is meant the ability of a material to withstand any possible test. Marble mosaic tile, glass tile, rubber tile terrazzo and metal tile, made to imitate clay tile, have come within the past few years. A careful inspection of any of these lines of material will soon prove their weak spots. In fact, they have already been proven on numerous occasions, and for this reason the claim made that they are cheaper is sustained only if we are looking for cheapness without any consideration for quality.

Ceramic tile is of such duration that it was used centuries ago, and still remains intact. The clay being burned at a high temperature ensures durability, so that there is no likelihood of any element affecting it in the least. The surface is so hard that there is no perceptible change made in it after years of constant wear. This is not possible with any of its substitutes.

When we build to-day, as we are now doing, structures that are supposed to embody the highest possible ideas with regard to protection from the ravages of the flames, then we should embody in these structures every possible fire resistant known, so that the buildings will be fireproof in fact as well as in theory.—Brick.

Toronto's new by-law for the purpose of affording greater protection to men working on scaffolds and structural steel work is a timely measure and one that is well worth consideration in other cities where there are lax regulations pertaining to this work. Only last week a Toronto jury found that a plasterer had come to his death directly as the result of injuries received from falling off a scaffold improperly constructed.

A Contractor's Criticism of Architects

In the interest of the building trades in general and the carpenter trade in particular, I would like to ask if it be possible for the contractors' and builders' organizations to devise ways and means to curb the arbitrary power of the architects. The way some architects act is almost beyond the endurance of the contractor. We all like to make a good job and the architect, as representative of the owner, has a right to expect it, provided his drawings and specifications call for such, but if he specifies No. 2 material he has no right to expect No. 1. He usually wants a first class job in material and workmanship at the expense of the contractor.

Suppose, for instance, that the specification calls for No. 2 flooring or sheathing; he has no right whatever to expect the contractor to cut out knot holes, bad places or dead knots, except when so stated in the specifications. As a rule, however, this is not done. No. 2 lumber is specified and the architect wants the contractor to make No. 1 out of it. For the contractor it would be cheaper to use No. 1 at the start, but if he figured accordingly his figures would be too high and he would fail to get the job. It is the same with the siding. The architects want "B" or "C" in the specifications, but require "A" on the house, and so we might continue from basement to roof.

The plans and specfications are the expression of the owner and his architect and they can and have a right to expect everything that is written or drawn in there, but not a blamed thing more. It is certain that where plans and specifications call for a first class job both in material and workmanship, the contractor's figures will be correspondingly high, and that is what the architect tries to avoid by trickery and he generally succeeds. On the other hand, the architects will claim that the contractors try to skin the job, and I am sorry to say this is also true in some instances, but they have to do it in order not to be swamped, for the architects and owners are so exacting that the contractor is trying to pull his end of the rope. This sort of game, started by owner and architects, sometimes results in their being beaten at their own game.

If the architects would start out to do right, I will wager they will be treated right by the contractors. As an example: Architect "A" has a plan for Mr. So-and-So and he wants "Builder B" to figure on it. "Mr. B." after studying the plans and specifications, gives the architect a reasonable figure. In the meantime the architect has secured figures from "Builders C" and "D," and tells "Mr. B" his figures are too high and that he must try to do it for less, so "B" throws off a hundred or so and the architect tells him to call again after a few days to get his decision. With this lowered bid of "Mr. B" he goes to "C" and tells him the same thing he told "B"; as a consequence "C" lowers his bid in order to get the job, and is told by the architect to wait a day or two to get his decision. Again with the lowered bid of "C" he goes to "D" and repeats the same story, with possibly some additions to it—that the job has to be cheap, even if the material should be of a little less quality. "D" comes down and finally gets the job. As the architect knows that he has at last the bottom price, "D" is started on the job and has material of less quality as the architect told him he could use, but now the trouble commences, for such and such material is specified and has to be used. As a consequence "D" is skinning the job wherever possible.

Instead of opening the bids at a set hour and place in the presence of all contractors and giving the job to the lowest or most able builder, they try to get the better of the contractors and everybody else, which in my opinion is most reprehensible practice. Then, again, they occasionally have another game up their sleeves, which is, that details will be furnished as the work progresses. This is a very unfair practice, as the details are almost always more elaborate than the general drawings indicate. Again the contractor or millman gets the worst of the bargain, but he will try some way to squeeze out or resort to some other trick to get even. It must be insisted upon by the contractors that plans and specifications should be complete before they are to figure on them and should be so plain and correct that no verbal explanation of the architect should be necessary, for it seems to be the habit of the architect to explain it only from his point of view or according to his opinion, at the cost of the contractor's pocket book. According to the general rules in most standard specifications the architect's word is law and final. This is wrong and should be remedied—the sooner the better.

We have in all our large cities contractors' associations. Could they not do something to relieve contractors of this burden?

Again, there is something else that I would like to bring before the readers of this department, which is this: Are the contractors going to stand any more of the architects' mistakes? It is enough to stand for their own and they should not be obliged to be responsible for those of the architect or anybody else. The architects take refuge behind the obnoxious "General Conditions," with which every contractor is familiar. This in my opinion is very unfair and ought to be changed.—J. H., in the Building Age.

Concerning an item in a recent issue of the "Contract Record" that railway contractors on the National Transcontinental Railway were experiencing difficulty in securing a supply of men for the construction camps, Messrs. Nadel & Adler, 375 St. James street, Montreal, write us that there are plenty of good laborers all over the United States, most suitable for construction work, and that they are willing to come over to Canada in masses if their transportation would be advanced. During the month of August they brought over 380 men from the United States, and placed them with various contractors.

Grooved wood block paving was laid last year on a 6 per cent. grade at Hamilton, Ont. In each block was a groove, ½-inch wide and 1 inch deep, which was laid at right angles to the centre line of the street. On the level approach to the incline the blocks were laid with cement grout, but on the grade an asphalt filler was used. The crown was laid very flat, according to Mr. Andrew F. Macallum, city engineer, rising only about 2 inches in the centre. It is stated that with this type of pavement heavily loaded teams are enabled to get a good foothold.

Little is being done as yet in the way of building permanent structures at Campbellton, N.B., but it is probable that a better and more substantial town will arise out of the ashes next season. At present contractors are offering all sorts of inducements to prospective builders. In some cases the prices quoted are so low that the difference between brick and frame construction is very slight. There are about 350 temporary shacks now standing.

Burnaby, B.C., is now expending $200,000 on good roads.

Importance of Systematized Construction Work

The importance of keeping cost records of construction work has come to be quite generally recognized, particularly by concerns engaged in undertakings of considerable magnitude. While such records, if properly kept, furnish excellent data upon which to predicate future bids and determine the cost of construction from day to day, they are of decided value in other directions, as in cases of litigation, particularly where questions of extra work are involved. A contractor supported by authentic records of this kind is in a position to maintain his rights in the event of disputes arising and, more particularly, where litigation ensues. Not only are such facts valuable as evidence but the disclosed fact that the contractor knows exactly what he has done and at what cost, makes a most favorable impression upon a jury, who are not partial to guesswork.

Such a system is not expensive, as records can readily be made by foremen and others without much loss of time. One who knows the exact cost of the work he is doing is possessed of a decided advantage over one who does not, and this manifests itself in many ways, including a knowledge of the efficiency of individual employes. Cost records on construction work ought to be more generally kept than they are, even by those who are operating in a small way.

Cost of Granolithic Finish of Concrete Floors

The following figures of cost for the finished surface of granolithic concrete floors are average results obtained by a Boston construction company during their long experience in laying this class of floor.

For a one inch finished surface laid integral with and at the same time as the structural concrete, finishers being paid 50c and laborers 20c per hour, costs figured for 100 square feet of finished surface:

Finishers' time		$1.00 to $1.30
Mixing and placing concrete		.42
Cement 1 11/100 barrels	1.40	1.55½
Sand, 3½ feet at $1		.12
Fine stone, 3½ feet at $2		.25
		$3.34½ to $3.64½

If laid after structural concrete has set and not integral with it, the total cost of the floor will be about $1.50 more per 100 square feet. If finished surface is reinforced with ¼-inch steel bars 12 inches on centres to prevent cracking, add extra labor for mixing and placing concrete 40c., and extra labor finishing 30c., or 70c. per 100 square feet, and for placing steel, 50c. per 100 pounds, with cost of steel about $3 per 100 feet laid down.

Bricklayers imported from England to take the place of strikers are being prosecuted by the Montreal Builders' Exchange for refusing to carry out the terms of their contract after arriving in Montreal. Upon reaching Quebec the men were met by representatives of the strikers who successfully beguiled them into their cause. The men were engaged on the specific understanding that they should commence work on August 20th and continue until the beginning of winter.

It is expected that the next four years will see the addition of 120,000 tons of shipping on the St. Lawrence route. Members of the Shipping Federation are directing the attention of the Government to the immediate need of a 35-foot channel and various other improvements to the route.

Bituminous Roads—Mixed and Poured

The Merits and Demerits of Penetration Methods—Hand Versus Machine Mixtures—Proper Proportioning of Mineral Aggregates*

While the writer is commercially interested in a special form of bituminous pavement and road construction known as "Bitulithic" in its application to city streets and "Warrenite" in its application to country roads in the United States and Canada, and laid in Great Britain and the Continent in a modified form known as "Quarrite," he hopes to accomplish an unprejudiced discussion of this subject.

In the year 1909 the New York "Herald" and Atlanta (Ga.) "Journal" offered premiums of $1,000 for the best, $500 for the second and $250 for the third best section of country road between New York City and Atlanta, Ga., one of the southern of the United States of America, covering a distance by air line of about 750 miles. The first premium was awarded to Mercer county, in the State of New Jersey, of which Frank I. Eppele is county engineer. In an excellent paper on the subject of "Future Highway Improvement" published in a current paving journal, Mr. Eppele says:

> I think the statement can be made that already the problem has been solved in part and that road engineers have practically agreed that the principles of construction which provide for the broken stone or other road metal used to sustain the wear, and some bituminous product applied in conjunction with same, possessing in a high degree the necessary binding and dust preventive qualities, will be the basis for adoption of a method for future highway construction. If this be true, I think we can logically conclude that a majority of road engineers will favor a method of construction that ensures a perfect coating of bituminous binder to every particle of road metal being used, and before same is spread upon the highway, to one that provides for the application of a binder to the surface of the material after same has been spread upon the work either by a method of pouring, sprinkling or spraying, and then depending upon the penetration qualities of the binder to give a uniform and perfect condition of coated work. Were it not for the question of cost involved, I am sure that a form of construction involving the use of a mechanically coated material, for at least the top course, or wearing surface of a road, would be adopted; but even taking into consideration this question of first cost, would not this increase be more than balanced by the condition of the roadway together with the wearing and other improved qualities of the same after construction?

From an article in the same publication we extract the following:

> It is safe to say that a grouted road is not as satisfactory and long lived as a mixed road. As the desirability of accurate proportions in a bituminous macadam is great the batch mixer will probably prove most satisfactory. The best results in Massachusetts have been obtained with broken trap rock 2½ inches to ½-inch in size, having 40 per cent. or less voids. If this percentage of voids is lessened by more small particles in the aggregate, say from 2½ inches to ¾-inch, still better results obtain. I believe that when a softer rock is used the slight crush which takes place during the construction draws in more bitumen and produces a denser pavement. Experiments have shown that bituminous surfaces having the voids filled with bitumen and trap pea stone are to be preferred in every case.
>
> A mixture of 2½-inch to ½-inch trap stone with 40 per cent. ¼-inch sand well mixed dry and then coated with bitumen should prove to be a very permanent road matrix.

The question naturally arises:

> If a mineral aggregate varying from 2½-inch to ½-inch having 40 per cent. or less voids is good, and if running the fineness of the stone down to ¼-inch is better, and if the voids are filled with sand, the mixture is still better, why should not the "ne plus ultra" be provided by going a little farther in the scaling down process as to sizes and using scientifically determined and accurately proportioned mineral aggregate down to the finest obtainable (impalpable powder) in which mixture the voids can be reduced as low as 10 per cent. and all the voids thoroughly filled?

Pouring or penetration methods have the following advantages:

Pros and Cons of Pouring Methods

(a) Very little investment in plant.

(b) The cheapest possible method of application. The following are the disadvantages of the pouring methods:

(a) After the stone is rolled the portions of the surface of many of the individual stones are in such contact with each other and many of the voids are so small that the bitumen cannot penetrate into many of the spaces and consequently cannot thoroughly coat the particles of stone. This objection rapidly increases as the minimum size of the stone used and the voids decrease.

(b) If the bitumen used is not hard enough and of a character sufficiently cementitious to bind the particles of stone together the road will gradually ravel if subjected to even a moderate traffic.

(c) Unless enough bitumen is used to thoroughly fill the voids to the greatest extent practicable the particles of aggregate are not even approximately bound together and satisfaction is only temporary.

(d) If the voids are filled with bitumen as much as practicable then the roadway has a surplus of bitumen or rather it is not properly distributed through the mass and the free and nearly pure bitumen in the large voids oozes to the surface under traffic during hot weather, making a sticky unstable and undesirable surface which ruts and rolls badly under traffic.

Very good examples of the two last mentioned disadvantages and inherent weakness of construction are found on sections of Huntington avenue, in Boston, Mass., which were laid under the most approved penetration methods during the summer of 1909. From the east side of Gainsboro St. to the east side of Bryant St. the spaces between the stones were filled very full with bituminous binder. To facilitate and make more thorough the filling of the voids the precaution was taken, after rolling the stone, of heating it with a large gasoline flame confined under a sheet iron hood resting on the surface of the rolled stone. The apparatus used was that known in the asphalt paving business as "surface repair heater." Between east side of Bryant street and east side of Ruggles street less bitumen was used and consequently the voids less thoroughly filled. In both sections bituminous cements were used of a grade of hardness which required heating to a temperature of about 275 degrees F. to liquify and consequently cementitious and of the "true binder" class as distinguished from liquid oils and tars often called "binders" although in the writer's judgment more properly classed as "dust layers." Both sections presented a fine appearance during the summer and fall of 1909 and the spring of 1910 and the intervening winter except that in spots in both sections where the bitumen had not penetrated well into the surface; ravelling began in the early spring. At this writing (June 13, 1910) on the section in which the voids in the stone were least filled the bitumen has disappeared from over one-third of the surface and we have on such portions practically a macadam road (as if no bitumen had been used) which is already ravelling and promises at an early date to require entire replacing. This section of the street shows great irregularity in amount of bitumen used, as there are many places from two feet to ten feet in length where there is an excess of bitumen which has been pumped by traffic to the surface and now is much too rich, showing deep calk marks and an unstable surface. On the section where the greater quantity of bitumen was used the surface is now so very soft that automobile and other vehicle wheels and horses' hoofs press into the nearly pure bitumen and unstable mineral aggregate at the surface to a depth of over one-half inch and the surface presents a very sticky and undesirable condition. In describing the rutting and marking of vehicle wheels and horses' hoofs, reference is made to moving horses and vehicles in the centre of the roadway and not to the still greater marking from standing vehicles and horses near the gutter.

---

*A paper by George C. Warren, President Warren Bros. Co., Boston, Mass. Written for the International Road Congress, Brussels, Belgium, July 31-Aug. 7th, 1910.

The mixing methods are of two general classes as to hardness of bitumen, known as "cold process" and "hot process," and two classes as to method of mixing, known as "hand mixing" and "machine mixing," which will be treated in the order named.

The "cold process," meaning the use of a mixture of stone and bitumen of such a character that the ingredients can be mixed and laid without artificial heat, that is at the temperature of the air. This necessitates the use of bitumen of a character which is liquid when cold and, as above referred to, in connection with "penetration methods" is necessarily deficient in cementing strength unless the bitumen is made liquid by the use of a volatile temporary liquifier which will evaporate soon after the roadway surface is laid. The "cold process" is also necessarily subject to the weakness that the moisture has not been evaporated from the aggregate before adding the bitumen which seems to be bad practice, to say the least.

In the writer's judgment, other things being equal, the "hot process" gives the best results but is necessarily more expensive both on account of the more or less expensive plant required to heat and mix the ingredients, and also the greater amount of labor required to heat and roll the much tougher, denser and harder surface mixture. The "hot process" has the great advantage of providing a surface which is "set" hard as soon as compressed and chilled to the temperature of the air.

Hand Versus Machine Mixtures

Hand mixtures have the following advantages over machine mixtures:

(a) Comparatively little expense of plant installation on account of which it is applicable for use on roadways of less area than practicable by machine methods.

(b) No cost of fuel and consequent saving.

(c) Some writers say machine mixing labor is less than hand mixing, but taking all items of cost, including plant installation and delivery of materials to and from the mixing plant, and labor, mixing and laying into consideration, the writer believes as a rule the reverse is the real condition.

The disadvantages of the hand mixing processes are:

(a) Manifestly less thorough mixing and less accurate proportioning and uniform distribution of ingredients and consequently greater variableness of results than with a properly constructed mixing and heating plant.

(b) Because of greater ease in hand mixing a marked tendency toward use of a softer bitumen.

(c) Impracticability of getting a thorough mixture without more power than can be executed by hand mixing if the combination of ingredients are as dense as they should be to produce the best results.

Machine mixing methods may be sub-divided into several classes, as follows:

(1) Mixing without accurately proportioning or heating ingredients for which ordinary concrete mixers either of the "continuous" or "batch" types will answer. This method has the advantage of least expense in plant and labor, which, in the writer's judgment, is very much more than counterbalanced by the disadvantages of using bitumen of a grade so soft as to be liquid at normal temperature and of less accuracy and uniformity of results.

(2) Mixing by heating without accurately proportioning the ingredients which, in the writer's judgment, is better than the last named method but still inherently defective.

(3) Using a well planned mixing and heating machine specially constructed for the purpose, which will produce the following essentials to a maximum degree of success.

(a) Uniformity and accuracy of proportioning of ingredients both as to varying sizes of mineral aggregate and amount of bitumen.

(b) Sufficient heat in the ingredients when mixed and laid in the work to evaporate moisture and permit the use of bitumen hard enough to furnish a "true binder."

(c) When compressed in the work a solid dense voidless, dry bituminous concrete wearing surface which will to the greatest possible extent prevent penetration of moisture (the enemy of all road surfaces) and withstand the troublesome automobile and other traffic without shifting or presenting undesirably soft surfaces.

Proportion of Mineral Aggregates

A word here on the subject of proportioning of mineral aggregates in bituminous wearing surfaces may not be out of place. The writer believes from his wide experience and observation as well as from theoretical reasoning that the following are necessary essentials to the best construction:

(1) That the sizes of stone or mixture of stone and sand composing the mineral aggregate of the wearing surface shall be scientifically and accurately proportioned varying from the coarsest size permitted by the thickness of the surface (at least ½-inch less than the depth of compressed surface desired) down to an impalpable powder, each size to be proportioned as to reduce the voids to the greatest practicable extent, which in practical work can be as low as 10 per cent. to 15 per cent. of the volume. To practically produce this result a mixing plant designed to proportion and control the sizes of the aggregates is essential.

(2) That sufficient bitumen shall be used to thoroughly fill the remaining voids and evenly but thoroughly coat every particle of aggregate, large and small, with a thin coating of bituminous cement of a grade which when cold provides a high degree of cementing strength and solid construction of bituminous concrete which (as is practically possible) when thoroughly compressed on the road foundation has the density and within about 5 per cent. of the specific gravity of solid rock of the character used in the wearing surface. This difference in specific gravity represents the difference between the specific gravity of the stone (say 2.8) and the bitumen (say 1.0-1.25) used in the construction and not voids or lack of density or stability in the compressed bituminous concrete wearing surface.

The route of the Grand Trunk Pacific line from Regina, Sask., westward has been located as far as Moose Jaw. The officials of the Grand Trunk Pacific are now only awaiting a settlement of its terminal matters with the Regina city council to let a contract for the construction of this line westward, and also to finish up the link from the city southward to its grade on the line to the boundary. Every effort is being put forth to rush construction on the line from Balcarres to Regina, but the contractor, Mr. J. D. McArthur, is badly handicapped owing to the difficulty of securing sufficient men and teams for the work.

The Transcontinental Railway Commissioners leave Ottawa early next month for an inspection of the line from Superior Junction to Winnipeg. They will also go over the Grand Trunk Pacific.

Estimating Plumbing Work

In estimating plumbing work the question often arises as to who is to profit by an estimator's or contractor's skill in design, economy of management or closeness in buying. That is, suppose by rearranging fixtures an estimator saw where he could save $500 on an operation; should he figure on the work as planned and pocket the difference between the cost as originally laid out and as rearranged, or should he estimate on the lower cost of the work and give to the owner the benefit of the saving?

There is no doubt but that if an estimator knew positively that he alone possessed sufficient skill to lay out the work so economically he would be perfectly justified in reaping the reward of merit and add to the profit account of his ledger the money saved by economical design. But right there is where the stumbling block lies. No man is so clever but others will be found who can show equal results, and the estimator who figures that he alone can lay out work economically will learn to his sorrow that other minds are equally bright, and many of the choice contracts he hoped to carry off will go to rival shops. The only safe way is for an estimator to assume that his competitors are more clever than he is, and that in order to bid lower than the others he must find the very lowest cost he can satisfactorily do the work for, then know the profit he is willing to do the work for, add it, and be satisfied whether he wins or loses. If he wins the profit is his. If he loses it is with the knowledge that he could not have taken off another dollar, so he has nothing to regret.

A writer in "Modern Sanitation," states an estimator must not assume, however, that because he could not do work cheaper the competitor who took it at a lower figure will lose money. Perhaps his skill in design is greater than yours, or he has some other method of procedure which enables him to do the work at a lower price. It is a good plan for an estimator when he has lost a contract for being too high, after he has figured his lowest, to inspect the work of his competitor from time to time as the installation progresses, to see if he can discover either in design, workmanship or materials wherein the difference lies between his cost for a certain piece of work and his competitor's.

The Percentage of Profit

The percentage of profit to add to an estimate will depend greatly upon the character of the work. If the work is hazardous, where there is danger of losing considerable if everything does not go right, with but little chance for profit even under the most favorable circumstances, a percentage of from 50 to 60 per cent. would be considered a fair profit. For example, suppose a house sewer and water pipe were to be extended from the old work just inside a cellar wall to the sewer and water pipes in the street; that the soil to be excavated through was treacherous, likely to cave or give other trouble, and the street was a busy thoroughfare where accidents might happen due to having the street open. In such a case, if the cost of doing the work were $200, a profit of 50 per cent. or even 60 per cent. would not be excessive.

In ordinary work within buildings, however, no such percentage would secure work. Ordinarily, on all work in small cities, and on small installations in large cities, the allowance is from 15 to 20 per cent., while on large work in large cities the allowance is from 8 to 10 per cent., according to the nature of the operation. For instance, in an operation where most of the cost is for fixtures and very little for labor, as is the case when the fixtures are well bunched together, an allowance of 8 per cent. might be all that an estimator could allow with a chance of winning. Take, for instance, a toilet room, or a couple of toilet rooms, at an institution where 80 fixtures, each averaging $35, are to be installed and where three workmen in 30 days can install the material. In such a case the cost of labor, which is the uncertain element in a plumbing estimate, bears but a slight proportion to the entire cost, and the signing of such a contract is almost like selling the goods on delivery. That being true, and there being no delay for the money, the contractor could better afford to do the work for a profit of 8 per cent. than he could other classes of work where the cost of labor is the chief item for a profit of 10 per cent.

Clean Surface for Painting Essential

In the repainting of some rooms it has been found that the paint did not dry out as quickly as it should, in fact, there appeared to be a tackiness that could not be gotten rid of. It perhaps was due to greasy conditions which had not been thoroughly cleaned. Paint will not dry over a greasy surface. An employer who instructs a man to clean down the work thoroughly before applying the first coat of paint, cannot be at the workman's elbow all the time to see that this is really done thoroughly. If the paint of a door dries everywhere excepting those portions above the lock, which are marked by the hands, I should have very little hesitancy in saying that the work was not properly cleaned off. In the same way if the seats in a public hall, a church or school, when renovated do not quickly dry, the probability is that they are more or less greasy. It may be well to point out here that the hardening of an oil paint takes place not by evaporation, as is the case with whitewash or distemper, but by the linseed oil absorbing oxygen from the atmosphere. Grease, however, is a great bar to oil paint drying, and a thoroughly clean surface is essential to good work in this respect. As to the cure of paint work which will not dry, if it is due to an excess of driers, there is nothing to be done but to remove the coat of paint and give another; but if it is due to another cause, such as dirt or grease, a cure may be sometimes effected by mixing a little gold size with turpentine, say in the proportion of three of the latter to one of the former, and giving a coat of this over the affected parts. Another cure which is often useful is to mix an earth color, such as ochre or sienna, with water, and give a liberal coat of this without adding any binding material, such as size. This coat should be left on some days—a week is not too long—and if at the end of that time the work is hard and dry, it will be due to the fact that the "tacky" paint or varnish has been practically absorbed by the ochre or sienna. A final coat of a good hard varnish may then be given, and the work will stand permanently.

An Amendment to Toronto's Building By-Law

In order to provide better protection for men working on scaffolds, City Architect Macallum, of Toronto, has prepared an amendment to the building by-law, the provisions of which are as follows:

As soon as the walls or structural steel on any building have reached the level of the first floor, the joists on such floors shall be placed and permanently secured in position, and the joists covered temporarily in a manner satisfactory to the building inspector.

All buildings over three storeys in heigth shall be provided with temporary plank stairs from the bottom of the roof of the building.

Outside scaffolds, either supported by continuous supports from the ground up, or upon thrust-outs from window or door openings, shall be provided from the second floor up, with tight plank floors and ten-inch curbs and two by four inch hand rails, 34 inches high, with not less than two by four standards and braces and when such scaffolds are used on buildings over 60 feet in height the space between the hand rail and the curb shall be filled in with wire netting.

Planking shall be erected above scaffolds, over the heads of workingmen, to protect them from falling material or tools on buildings more than two storeys high.

All scaffolding or temporary supports of any kind which is or are used during the erection, alteration, or the making repairs to any building, shall be of sufficient strength to carry safely the load to be placed thereon.

New Proposal for Montreal Water Supply

Summary of Interesting Report Submitted by Engineers Hering & Fuller Extensions and Filtration Plant to Cost Several Millions

The report on the Montreal water supply as prepared by Messrs. Hering & Fuller, of New York, and submitted to the city council of Montreal, is of considerable interest. A comparison is made of the scheme for obtaining a supply from the Laurentian Mountains and the present service. The installation of a filtration plant at a cost of $1,500,000 is advised, also the immediate enlargement of the aqueduct and extension of the intake. The report is summarized as follows:

It is not possible to secure an adequate supply of good water from artesian wells or other underground sources on the Island of Montreal or vicinity.

A gravity supply from the Laurentian mountains might be secured from several sources, by far the most favorable of which is the watershed of the River Ouareau, above Rawdon.

The quality of the untreated Ouareau river water is not such as to give regularly a suitable water supply. The water is quite highly discolored by vegetable matter and the numerous lakes upon the watershed contain at times quite heavy growths of algae and other forms of microscopic life which are liable to produce objectionable tastes and odors in the water.

There is sufficient population in the villages and near streams and lakes on the drainage area to make very doubtful at times the hygienic quality of the water in its raw conditions.

Expropriation of the entire drainage area seems to be prohibitively expensive and even such a step would not eliminate the sanitary danger from persons temporarily visiting the lakes and streams of the watershed.

Taking all of the evidence together we are firmly convinced of the necessity for filtering the water of the Ouareau river in order to make it a suitable source of supply for the city of Montreal.

The cost of delivering into the city reservoirs 50 and 100 million imperial gallons of water per day from the Ouareau river, is estimated at $12,050,000 and $18,032,000 respectively, after making moderate allowance for damages due to the diversion of water used for water purposes and for interference with lumbering industries.

Montreal is fortunate in having at its door one of the largest rivers on this continent, and which offers favorable opportunities for water power development. At the same time, the St. Lawrence river provides a source of water supply which as to quality in its raw condition is far better than that supplied to many large cities elsewhere. In speaking of the quality of the St. Lawrence water in this manner we refer to water drawn some distance from shore so as to exclude the influence of local shore pollution.

We approve of the project of enlarging the power canal or aqueduct, the cost of which for all present developments, together with water wheels, pumps and wheel house needed in the near future is estimated to be in the neighborhood of $2,250,000. This is a sound business proposition based upon the fact that the interest on this investment is very much less than would be the cost of fuel to generate steam for an equivalent amount of power for pumping water, developing electricity or for other purposes and for which the city would no doubt find a ready market.

We approve the proposition to extend the intake some 1,200 feet or more from shore and connect the same to the head of the present closed conduit. This will give a much better quality of water than is now drawn from shore, both as regards appearance and hygienic quality, and also give a water which is easy to filter.

We do not anticipate any serious trouble from frazil at such an intake, but it may be that water will have to be drawn occasionally from near shore.

The only feature upon which the St. Lawrence water, from the proposed outer lake, compares unfavorably either with the shore water at the persent intake or water from the Ouareau river, is with respect to hardness. We do not consider this to be an unsatisfactory feature because during the winter months the city of Montreal has been accustomed to using this water with satisfaction. Furthermore, it is a very similar water, as to hardness, to that used satisfactorily by various cities and towns located on the Great Lakes, and it is practically as soft as is the softened water at several places where, in the middle west, softening works have been introduced to improve the quality of waters of excessive hardness.

The most suitable method of filtering the St. Lawrence water from the proposed outer intake is by double filtration. For a plant having a rated capacity of 50,000,000 imperial gallons daily it is estimated that the investment cost, exclusive of land, will be $1,445,500, and that the annual cost of operation and maintenance, including the fixed capital charges on the investment, will be $130,900 for this quantity of water.

The filtered water from the St. Lawrence river, pumped by water power, will give an improved supply of a quality as satisfactory as a filtered gravity supply from the Ouareau river and at very much less cost.

In conclusion, we recommend that steps be taken to carry out promptly the construction of the proposed outer intake with connecting pipes, that the necessary appurtenances be installed for the utilization of the additional power to be developed by the enlargement of the power canal or aqueduct now in progress, and that double filters, substantially as described in this report, be built on land near the foot of the aqueduct and adjacent to the present low level pumping station.

As to the date of completion of the filtration works, it is feasible to build them under favorable conditions, in about 30 months, if the preparation of plans is promptly authorized, so that the principal work may be placed under contract in the early spring of 1911. In the meantime construction may proceed on the new intake and some other appurtenances, with the safe quality of the water supply assured by the careful maintenance of the present sterilization plant.

Sulphur-sand joints were used for the small sanitary sewers of the new sewerage system of Louisville, Ky. Joints of a mixture of sulphur and fine moulding sand in equal parts were first tried; these developed radial cracks, and 12 hours after pouring the entire joint loosened. After tests of various mixtures the one which proved most satisfactory, according to the report of Mr. J. B. F. Breed, chief engineer, and Mr. Harrison P. Eddy, consulting engineer, to the Sewerage Commission, consisted of 6 parts fine moulding sand, 4 parts screened Ohio river sand and 10 parts sulphur. The river sand was passed through a No. 20 sieve. With this mixture the joints did not loosen, and the radial cracks occurred rarely. It was found that the mixture began to melt at 201 degrees Fahr., was fluid at 261 degrees, was slightly viscid at 302 degrees, and would not pour at 315 degrees. The material hardens rapidly, and while still warm is coated with hot tar pitch as a further precaution against leakage. The practice at Louisville has been to pour joints in three or four pipe lengths in cradles on the ground surface and those between sections of jointed pipe in the trench. An asbestos jointer with spring clamp was used. Briquettes made of sulphur and sand of the proportions used on the work showed a tensile strength of 520 to 640 pounds per square inch.

J. B. O'Brien, of Renfrew, Ont., who has a contract for the construction of 800 miles of the National Transcontinental, was in Toronto last week purchasing supplies. Mr. O'Brien has built 436 miles in northern Ontario.

Mr. D. P. Roberts, city electrical engineer, of London, Ont., has been appointed electrical expert and inspector for the British Columbia Government.

Clearance and Grade Requirements for Carrying Highways Over or Under Railway Lines[*]

The physical laws for grade separation are summed up in two:

1. The structure carrying the upper line of traffic must be sufficiently high above the lower traffic way to clear all objects passing on the latter;
2. The grade on either traffic way, approaching the crossing, must be practicable for the traffic thereon.

The maximum height of loaded vehicles and any objects thereon on city streets or country highways has been accepted as 14 feet. This height is also sufficient to clear regular street railway traffic. While higher objects are moved along roads occasionally, it is properly not considered necessary to endanger the practicability of crossings under railways to accommodate them.

The vertical clearance, top of rail to bridge, required over railway tracks, is in most cases much higher than over highways, and this constitutes, in the great majority of cases, the insurmountable obstacles to grade separation. The highest fixed projection on an ordinary railway train is the locomotive smoke stack, and passenger cars project higher than the great bulk of freight cars; but some, comparatively extremely few, special freight cars are higher than either passenger cars or locomotive stacks. The extreme clearance requirement is for height, top of rail to running board, of highest car, height of brakeman added thereto, and a further allowance for contingencies, among which may be height of load of light material on an open car exceeding maximum box car height.

There are, at the present time, on the railways of standard gauge in the United States, Canada and Mexico[†], about 2,377,282 freight cars of all kinds. They classify as to height, rail to running board, as follows:

	Per cent.
Under 12 feet, including flat, gondola and tank cars..	63.1
12 feet to 13 feet	23.4
13 feet to 13 feet 6 inches, inclusive	11.9
13 feet 6 inches to 14 feet, inclusive	0.65
Over 14 feet	0.95

Limits of car dimensions are fixed by clearance outlines on the various railways. A composite clearance limit diagram for 90 railways, including all Canadian trunk lines, has a height of 14 feet 6 inches, limiting "over all" height of cars to this figure and practically limiting height of top of running board of freight cars to 14 feet. In the St. Clair tunnel, Grand Trunk Railway, the clearance height at width of 3 feet is 14 feet. It is true that on many divisions or branches of the lines considered, the clearance is somewhat greater than shown in the composite diagram referred to, while on the other hand, it is less on a number of main lines, and on many branch lines.

The limit of grade, approaching crossings, can for railways be taken as between 0.5 per cent. and 1 per cent. For city streets a grade of 5 per cent. is in most cases extreme and it should be so for main country highways. A preferable maximum grade for roads is 4 per cent., and 3 per cent. is materially better. This works out as follows:

For 5 per cent. grade 20 x 2 = 40 feet length of approaches for every vertical foot of clearance.

For 4 per cent. grade 25 x 2 = 50 feet length of approaches for every vertical foot of clearance.

For 3 per cent. grade of 33 feet 4 inches x 2 = 66 feet 8 inches length of approaches for every vertical foot of clearance.

Any gain, by curtailment of vertical clearance requirement, or by change of railway grade, or by both, means corresponding shortening of road approaches at the high end. Such a gain of 1 foot may greatly reduce the cost of a given grade separation, making it practicable when it would not otherwise be so. A vertical gain of 2 feet would mean a very large addition to the number of practicable grade separations.

The extreme allowance that should be made for brakeman on a car must not exceed 7 feet; 6 feet 6 inches will clear any brakeman unless he should be over 6 feet tall, and 6-foot brakemen are not common, to say the least. The necessity for brakemen on the tops of cars is becoming less and less, and has in many cases disappeared, rules and regulations of railway companies to the contrary notwithstanding. The air brake is now universally used in train control.

The Pennsylvania Railroad makes it a rule to avoid all grade crossings on new work, and has within the last nine or ten years eliminated over 50 per cent. of all its grade crossings on main lines. To do this clearance must be made as low as possible. Overhead bridges are as low as 16 feet 6 inches above the top of rail, while many are 18 feet 6 inches and less. Twenty-one feet, the standard for signal bridges, is recognized as the highest clearance for which there can be any need. In New York State many overhead bridges are only 18 feet above the top of rail, and this is the case also in Massachusetts and in other States. The New York Central & Hudson River Railway has asked for 16 feet or 16½ feet clearance for all overhead bridges within the electric zone, extending 16 miles from the Grand Central Station, in the city of New York.

It is submitted that with conditions as they are and more so with regard to the future, 20 feet (13½ feet for car and 6½ feet for man), is a reasonable vertical clearance. It has been shown that 13½ feet covers the height to running board of all but a very small percentage of freight cars now in use, and that cars higher than 14 feet to running board, i.e., higher than 14 feet 6 inches "over all," or to top of brake rod, can only to a limited extent traverse beyond their home railways. That higher cars will be economical or practicable is as little probable as that the gauge of railways will be widened or their entire structure changed. For a vertical clearance requirement greater than 21 feet (14 feet plus 7 feet), there can, in any event, be no conceivable rational need.

In Massachusetts there is a special Grade Crossing Commission. The minimum clearance required by this commission is in general 18 feet. Connecticut and Rhode Island also specify 18 feet. In New York the Public Service Commission requires 21 feet clearance where practicable, many lower bridges are built throughout the State, some, as already stated, are as low as 16½ feet. New Hampshire, Ohio and Indiana require 21 feet. The only States requiring more are Illinois and Vermont, where 22 feet is specified, but exception is made where this height is not practicable.

In Canada, the Dominion Railway Act of 1904 specifies a minimum clearance of 22 feet 6 inches, above rail level (allowed to mean base of rail) for brides over railways, with no deviation except by leave of the Board of Railway Commissioners; and this board has hitherto not allowed a deviation in any case.

---

[*] From a paper by W. H. Breithaupt, M. Can. Soc. C.E., read before the Canadian Society of Civil Engineers.

[†] Official Railway Equipment Register.

Nova Scotia Civil Engineers' Convention

The fourth annual convention of the Nova Scotia Society of Civil Engineers was held recently in Halifax.

The papers read included: "Water Powers of Nova Scotia," by W. G. Yorston, C.E., and "Recent Developments in Technical Education," by F. H. Sexton, Director of Technical Education, Nova Scotia.

Mr. Sexton referred to what was being accomplished in the United States and at Halifax, N.S. Excellent evening courses in engineering are provided by the Cooper Union, New York, and the Polytechnic Union, at Brooklyn. Degrees are obtainable in this way at both institutions. The Technical School at Halifax is planning to emulate the example of the universities of Chicago and Wisconsin by establishing correspondence courses. These courses will afford the opportunity for training to students in remote districts who would otherwise, perhaps, have no chance of taking up the work. An interesting feature of the work at the Halifax Technical College is a course in highway construction in which attention is concentrated mainly upon the practical side of road building. The subjects considered are the location of roads, road building, road maintenance, road machinery, culverts and small bridges. Investigations of cost are an important branch of this work.

The following officers were elected for the ensuing year: President, J. W. MacKenzie, Halifax; 1st Vice-President, P. A. Freeman, Halifax; 2nd Vice-President, W. G. Yorston, Sydney; Secretary and Treasurer, J. Lorne Allan, Dartmouth.

Among the events of the session was a visit to the municipal lighting and stone crushing plant at Dartmouth.

The R. A. I. C. at Winnipeg

Many Important Subjects Discussed at Annual Gathering—Protecting the Interests of the Canadian Architect

At the annual convention of the Royal Institute of Canadian Architects held last week in Winnipeg, the following officers were elected: President, F. S. Baker, Toronto (re-elected); Vice-Presidents, J. S. Resther (Montreal), Edmund Burke (Toronto), S. Frank Peters (Winnipeg); Hon. Sec., Alcide Chausse, Montreal; Hon. Treas., J. W. H. Watts, Ottawa.

President F. S. Baker touched upon some vital matters in his annual address. He made special reference to the subject of protecting Canadian architects. Mr. Baker said in part: "Among the important questions you will be asked to consider will be the federation of the provincial associations with the institute; the employment by Canadian capital of architects practising in the United States, who have no other interests here than the commission which they derive from their plans. The work of the skilful gentlemen may have assisted the architects of Canada, but we feel that the time has arrived when Canadian architects can do the work. The only evident manner in which this object can be attained is through placing a heavy import duty on the services of foreign architects. With us this is purely a matter of self-protection. We are always ready to meet and welcome visiting architects, but I think that it should be the object of this institute to protect its members as other bodies protect theirs."

The Canadian Manufacturers' Association promised cooperation if Canadian material were specified by the architects.

A topic which provoked much discussion during the session was the seizure by the Customs officials of the plans for the new Bank of Montreal at Winnipeg. These plans were brought into Canada from the office of the architects, Messrs. McKim, Mead & White, of New York, via Montreal, and had been in the Winnipeg office in the McArthur building since last March.

According to Mr. J. N. Semmens, the Winnipeg representative of the New York architects, all Customs duties and fees were paid at the port of Montreal, but the Customs officials were not satisfied.

A resolution was passed requesting the Dominion Government to raise the duty on the plans of foreign architects to be used in Canada. It was also decided to apply for amendments to the charter of the institute to provide for the federation of all provincial architects' associations under the auspices of the institute.

Railroad Construction and Poetry

Poetic effusions from railroad construction camps are not what one would expect, but, according to "Engineering and Contracting," nearly all such camps had their hobo poets before the Irish and other foreign laborers drifted into the cities and became ward politicians and policemen. These artists usually selected some smooth board or plank that happened to be lying around the camps, the sides of wagon boxes, bottoms of new wheeled scrapers and the surfaces of any other tool or board about the camp that a lead pencil could be worked over. These verses would be the talk of the camps for weeks, and all the "men of letters' 'about the camps could repeat them by heart; but they seldom got into print, and the rains, sand storms and natural wear on the equipment soon blotted out all records.

The following stanza, signed "Sub-Contractor," has a Miltonian essence about it that will appeal to anyone of æsthetic tastes:

Who comes with Faber sharpened keen,
With profile long and sober mien;
With transit, level, book and tape,
And glittering axe to swat the stake?
The Engineer.

The manner in which one of the engineers "came back" at "Sub-Contractor" will appeal to even those whose tastes are not æsthetic:

Who is it that cusses the engineer,
And says that the classification is weird and queer;
Who signs a contract dashing, gay and bold
And later swears specifications stale and old?
Who takes Class "D" at a sure losing price,
And wants it called "A" so his profit will be nice?
The Contractor.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

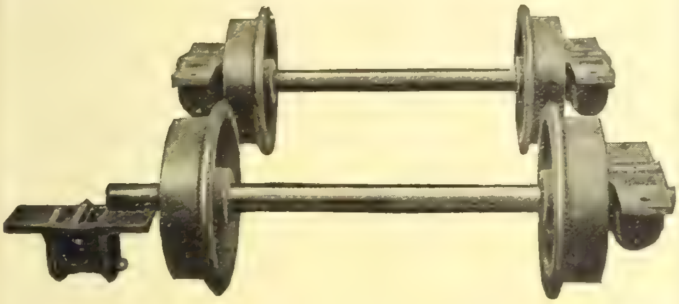
would result in additional competition, which might save your city or town or your client many hundreds of dollars.

The
"Simplex" Stone and Marble Cutter

This tool is furnished with adjustable blades for both freestone and marble, the blades being replaced when worn. The new blades are cheaper than sharpening the solid tools and save a lot of trouble. They give perfect satisfaction.
We also supply double tooth cutters for stone planing machines.

Bailey-Underwood Co., Limited New Glasgow, N.S.

Build Your Own Cars Using Our Irons



Your cars will cost you less, and will be built just to your liking.
We make a business of manufacturing car wheels, axles and boxes.
We employ expert, high-priced metallurgists to regulate the composition of iron in our wheels and get just the right chill.
We guarantee our car wheels to be strong, tough and well chilled, ensuring long service.
We make wheels any size, fit them to axles for any gauge track, and supply any style of box required.
Let us quote you.

Marsh & Henthorn, Limited
Makers of Hoisting Machinery **Belleville, Ont.**
Sales Agents: MUSSENS LIMITED, Montreal

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."
—The Philosopher of Metal Town.

"METALLIC"
Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

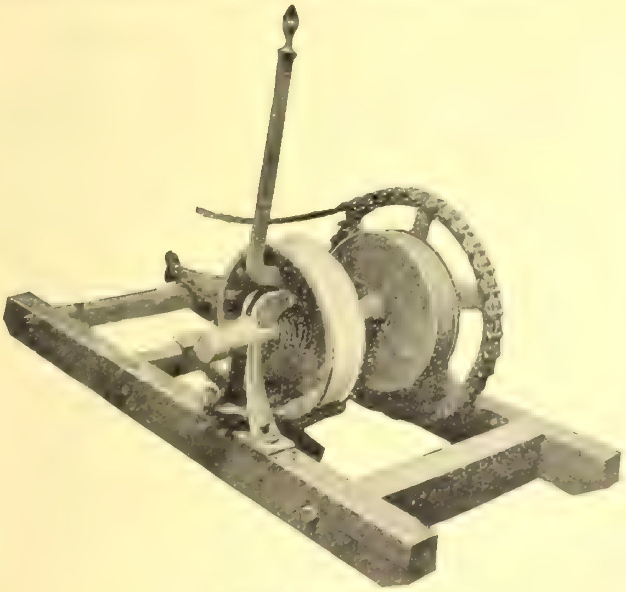
Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers 1954

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

THE MILTON PRESSED BRICK Co. LIMITED

M P B Co

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St,

Granite Marble
Tiles Slates

Ceramics
Marble Mosaics
Marbleithic Tiles
Wall Tiles
Quarries

We carry a stock of above materials in Montreal and are prepared to supply the trade at lowest prices.

The Smith Marble & Construction Co.
Limited
The Calkins Tile & Mosaic Co.
Limited
458 Bleury Street, MONTREAL, QUE.

A Contractor's Pump

The Waterous

Split-Base

Centrifugal

A pump in which Simplicity, Strength, Durability and Campactness are combined. Which will not clog up, will run every minute of a ten hour day, and can be left to the care of an unskilled laborer, without going to pieces.

Built in horizontal and vertical types and designed to be belt, engine or motor driven. In all sizes, up to 14 inches discharge opening.

Write for Pump Bulletin No. 200

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper, but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Sand & Supplies
LIMITED
Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite
Crushed Stone and
Sewer Pipe

M. 4507

Port Credit Brick

Is the leading building material of to-day because of the strength, color and quality. We make the following :

Repressed Wire Cut Brick
Common Wire Cut Brick
Pressed Brick
Paving Brick
Our prices will interest you.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries
Red and Grey Freestone
Oakley Myers, Amherst, N.S.
Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

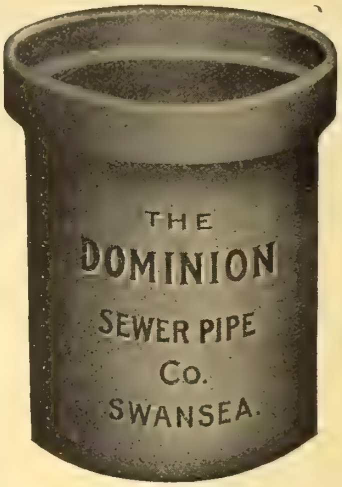
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER

Builders' Supplies

Contractors' Machinery

IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe

Single and Double Strength. Sizes 3" to 42"

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

J. H. NEW
President

RYLAND H. NEW
Vice-President

Hamilton Vitrified Salt Glazed Sewer Pipe
Acknowledged by **all Engineers** to be
More **durable** and **superior**
In every way than other makes.
Let us tell you where we **excel**
The **delivery** that we give, cannot be
Obtained from other manufacturers.
No order too small, none too large.

Price lists, discounts and all other
Information furnished promptly on request.
Price always consistent with market values.
Experience "50 years in the Business."

The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or Write us

Hamilton and Toronto

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month.

THE
CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read The Cement Era. The price for subscription is [illegible] a year. Ask for sample copy.

The Cement Era Publishing Co.
1800 Monadnock Block - - CHICAGO

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

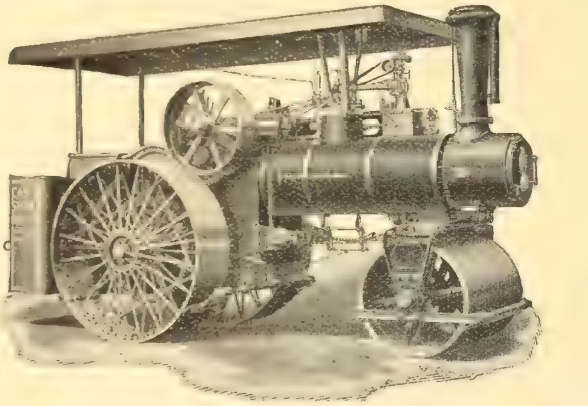
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

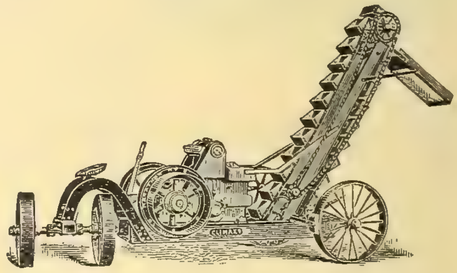
J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Climax Crusher with Folded Elevator



Our "Climax Crusher" has without an exception given satisfaction everywhere it has been purchased. It is very complete, easily operated and crushes the hardest of hard heads with ease. The superior feature of our "CLIMAX CRUSHER" is that the repair bill amounts to comparatively nothing even after several years constant use. THIS IS AN IMPORTANT POINT TO CONSIDER IN PURCHASING A CRUSHER.

All sizes ready for shipment.

Catalogues furnished on application.

The

Climax Road Machine Co.

Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work
and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manage

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

JOHN T. FARMER

MECHANICAL and HYDRAULIC ENGINEER

427 Coristine Bldg. - MONTREAL

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

CONSULTING CIVIL AND SANITARY ENGINEERS

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry, Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

QUEEN CITY FOUNDRY Co., LTD.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,

Phone Main 7692 Toronto, Ont.

RAILS for Contractors, Switches, Girders, etc.
New and Second Hand.

LOCOMOTIVES AND CARS

John J. Gartshore

58 Front Street West, TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work	$10.00 to 11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
.60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to colo., 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b. Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.

Turpentine, in barrels, 89 cents per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

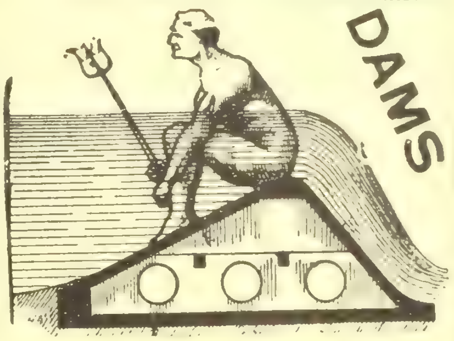
The Canada Roofing Company, Montreal, Que., are stated to have dissolved.

Grey and Bruce Portland Cement Company, of Shallow Lake, Owen Sound, Ont., it is stated, have assigned to John Lind.

The Eastern Canada Steel & Iron Company, Limited, Quebec, Que., expect shortly to commence operations. Their new work shop is almost entirely completed, and they will soon be enabled to begin construction work on several important contracts already secured.

Messrs. Perrault & Gervais, contractors, Montreal, have taken a seizure in the hands of the Quebec Oriental Railway Company, on a claim which they make against the Atlantic-Lake Superior Railway Company for $75,492.81. This claim is in connection with material furnished for the construction of a railway branch in Bonaventure county, and said branch having since been purchased by the Quebec Oriental Company, with acceptance of liabilities to the extent of $50,000, the present seizure is taken by the contractors.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith.** That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**

AMERICAN

ALSEN
45 BROADWAY, NEW YORK

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

GERMAN

Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections

See page 155 in "Sweet's" for full particulars.

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

There have been 22 championship contests for speed in typewriting. The Underwood has won them all.

Being the best machine for the most exacting requirements it does not lose any of its efficiency in the more ordinary uses.

United Typewriter Co., Ltd.
TORONTO And All Other Canadian Cities

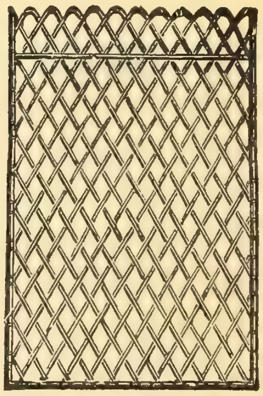
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled.
Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

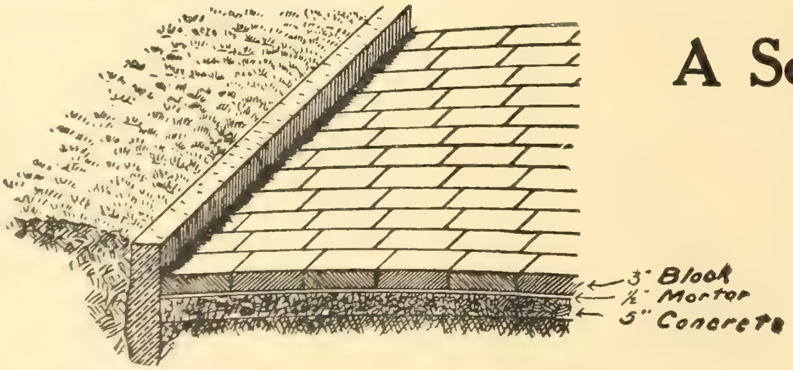
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

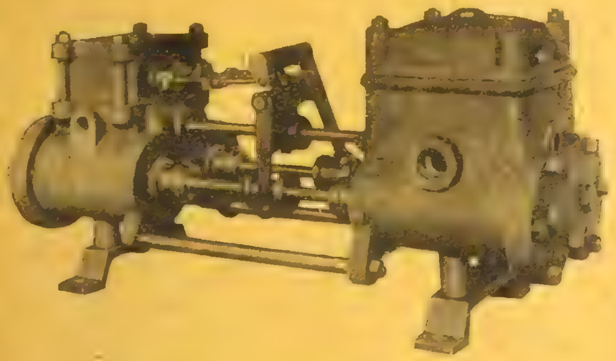
Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co. Limited

Toronto, Canada

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.

Rib Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co. Limited

GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills Limited

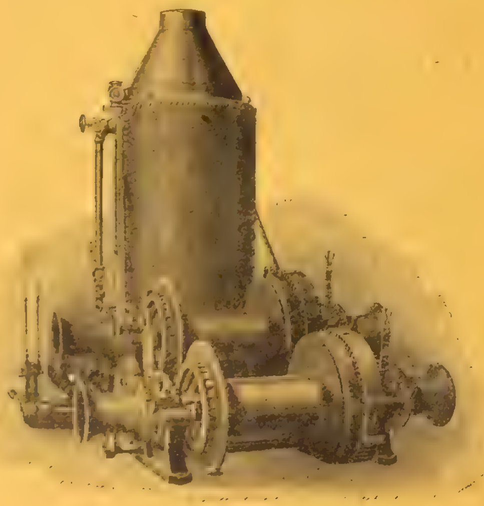
Midland, Ontario

Centrifugal Pumps

of all Capacities

We furnish both belt and steam driven pumps in all sizes. Our regular line of pumps will elevate water 50 to 60 feet, and by making them extra heavy a single pump can elevate to 100 feet. For greater head high lift pumps should be used, which are capable of working against any heads.

Let us have particulars and we will submit proposition covering pump to suit your special requirements.



Hoisting Engines

To Suit all requirements

We can ship promptly all sizes of hoisting engines and we would like your enquiry when in the market.

Derricks **Wire Rope** **Fittings**

Let us send you Catalogue

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec Dunn Bros., Winnipeg Ritchie Contractors Supply Co., Vancouver

Progress of Construction on Quebec Bridge

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Vol. 24 Toronto, September 7, 1910 No. 36

STEAM AND POWER PUMPS

PACKED PISTON PUMPS

For any service up to a water pressure of 150 pounds.

CENTRE OUTSIDE PACKED PLUNGER PUMPS WITH POT VALVES
Specially adapted for marine work.
AUTOMATIC FEED PUMPS AND RECEIVERS. COMPOUND DUPLEX PUMPS. INDEPENDENT JET CONDENSERS. CENTRIFUGAL PUMPS. OIL SEPARATORS.
All suitable for export. Write for Special Prices and Discounts.

THE SMART-TURNER MACHINE CO. LTD.
191 BARTON ST. EAST, HAMILTON, CANADA

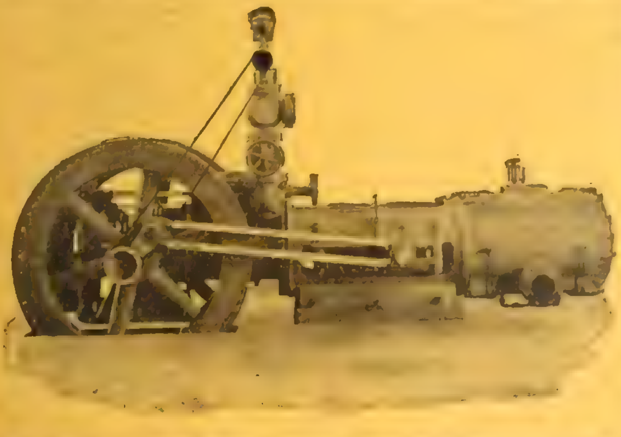
"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

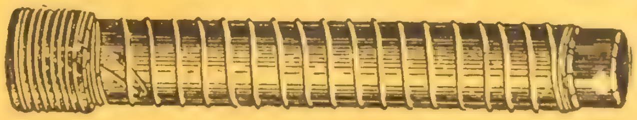
The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO



CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity Efficient Regulation
Large Bearings -Rigid Construction
Ask for Descriptive Catalog K 81

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE
PORTLAND
CEMENT

Mills at
Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound. Ont.
Calgary, Alberta

Head Office :
Montreal

Sales Offices :
Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canada Wire Goods Mfg. Co. 15
Dennis Wire & Iron Works 16

Belting

Federal Engineering & Supplies, Ltd 59

Boilers

Inglis, John 24
Jenckes Machine Co. 2
Marsh & Henthorn 53
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co 63
Waterous Engine Works Co.

Brick

American Enamelled Brick Co. 22
Canadian Pressed Brick Co. 55
Don Valley Brick Works 7
Hamilton Pressed Brick Co 10
Milton Pressed Brick Co.
Port Credit Pressed Brick Co. 55
Toronto Pressed Brick Co.

Bridges (Steel)

Canadian Bridge Co 18
Cleveland Bridge Co. 18
Dickson Bridge Works
Dominion Bridge Co 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware

Taylor-Forbes Co. 63

Cement

Alsen Portland Cement Co. 62
Britnell & Co 16
Bremner, Alex 59
Canada Cement Co 3
McNally & Co., W. 55
Morrison & Co., T. A. 60
Rogers, Alfred 4
Rogers Supply Co 31
Sand and Supplies 55

Conduits Page

Conduits Co., Limited 16

Concrete Mixers and Machinery

Canada Foundry Co 5
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F., H 64
Jenckes Machine Co 2
London Concrete Machinery Co 23
Mussens Limited 32
Morrison & Co., T. A 60
Rogers Supply Co 31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co. 61
Beath & Son, W D 13
Buffalo Steel Co 19
Canada Wire Goods Mfg. Co 15
Hamilton Iron & Steel Co.
Trussed Concrete Steel Co 53

Contractors' Plant

Beatty & Sons, M. 15
Hepburn, John T 17
H. & E. Lifting Jack Co.
Hopkins & Co., F. H 64
Katie Foundry Co 60
Marsh & Henthorn 53
Mussens Limited 32

Crushers (Stone and Rock)

Hopkins & Co., F. H. 64
Jenckes Machine Co 2
Mussens Limited 32
Morrison & Co., T. A 60

Corrugated Iron

Galt Art Metal Co
Metallic Roofing Co 51
Metal Shingle and Siding Co. 20
Ormsby, A. B., Limited 5
Roofers Supply Co 59

Contractors Page

McIlwraith, Jas. A 60

Drills

Beatty & Sons, M 15
Canadian Rand Co 1

Deafening Felts

Cabot, Samuel, Inc 55

Drilling Contractors

Harvey, J 61

Dredges

Beatty & Sons, M 15

Engines

Canadian Boving Co.
Inglis, John 24
Jenckes Machine Co 2
Mussens Limited 32
Waterous Engine Works Co.

Excavators

Harris, J. W 11

Electrical Apparatus and Supplies

Northern Electric & Mfg. Co. 34

Engineers (Civil and Mechanical

Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Davis & Johnston 60
Farmer, John T 60
Fuce, Edw. O 60
Galt Engineering Co., John 60
Glaubitz, H. J 60
Hunt & Co., Robt. W. 55
Inglis, John 24
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H 60
McRae, John B 60
Moore & Scollan 60
Nadel & Adler 60

Fire Apparatus Page

Morrison & Co., T. A 60
Seagrave, W. E 16

Fireproof Doors and Windows

Douglas Bros 14
Mussens Limited 32
Ormsby, A. B. 5

Granite and Marble

Laurentian Granite Co 60
Missisquoi Marble Co
Rogers Supply Co. 31
Smith Marble & Construction Co.

Glass

Chance Brothers & Co. 8
Consolidated Plate Glass Co.
Luxfer Prism Co 2
Thompson & Co., B. & S. H 8
Toronto Plate Glass Importing Co. 1

Heating Apparatus

Jenckes Machine Co. 2
Leonard & Sons, E 54
Taylor-Forbes Co 63

Hoisting Machinery

Beatty & Sons, M 15
Inglis, John 24
Jenckes Machine Co 2
Hopkins & Co., F. H 64
Marsh & Henthorn 53
Mussens Limited 32
Scott Machine Co 53

Hydrants

Canada Iron Corporation 59
Gartshore-Thompson Pipe Co 58
Kerr Engine Co

Lime

Christie, Henderson & Co. 17
Jamieson Lime Co 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

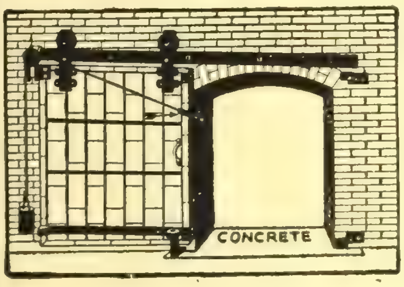
Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Do You Know Why We Label Our Fireproof Doors?

To protect your Client in two ways—To see that the maximum reduction in Insurance Rates is given—only **Labelled Doors** get this—others mean but a partial allowance—and to give really Fireproof goods—**Labelled** doors are sure to prove themselves when struck by Fire. Let us quote you on them.



Manufactured by

A. B. ORMSBY, Limited
Experts in Fireproof windows and Doors
Factories - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

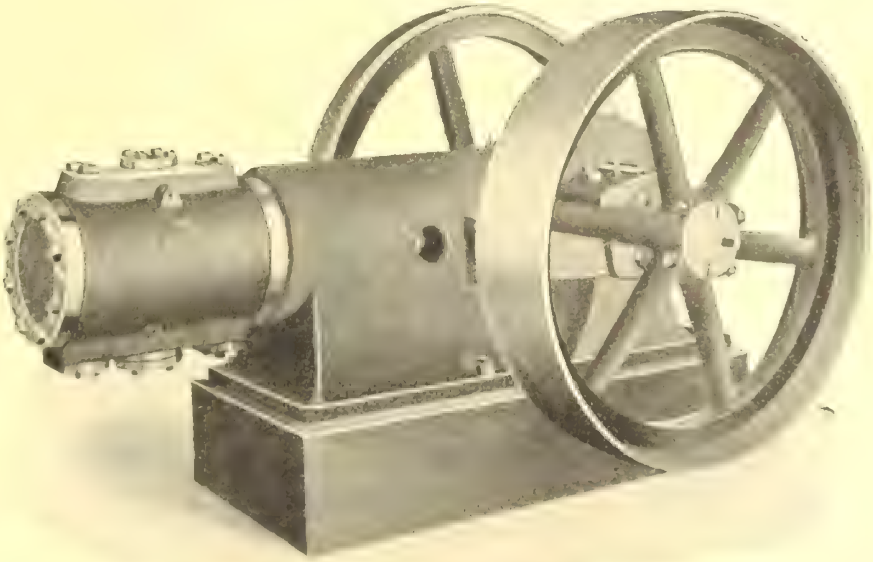
Hagersville Contracting Co.
Limited
Hagersville - Ont.

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



Canada Foundry Company, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

Lumber and Interior Finish

	Page
Batts Limited	10
Blonde Lumber Co.	54
Delaplante, Ltd.	20
Eaton & Sons, J. R.	23
Georgian Bay Shook Mills	63
Rhodes Curry & Co.	
Sanitary Floor Co.	62
Siemon Bros.	53
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	
Metallic Roofing Co.	53
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co.	15

Paving and Paving Materials

Dominion Carbolineum Works	12
Metropolitan Paving Brick Co.	22
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	63
Britnell & Co	16

Pipe

Canadian Pipe Co.	58
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	58
Municipal Construction Co.	17
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co.	34
Paterson Mfg. Co.	21

Pile Driving

	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery

Beatty & Sons, M.	15
Goulds Pump Co.	53
Hopkins & Co., F. H.	64
Inglis Co , John	24
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	57
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials

Barrett Mfg. Co.	21
Brantford Roofing Co	11
Galt Art Metal Co.	
Metallic Roofing Co.	53
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies

Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	58
Climax Road Machine Co.	58
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	16
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	31
Standard Drain Pipe Co.	56

Sand

Rogers Supply Co.	31
Sand & Supplies	55

Stone

	Page
Brodie & Co., Jas.	54
Britnell & Co.	16
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	59
Corinthian Stone Co.	15
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	55
Wiarton Stone Quarry	61

Structural Iron and Steel

Buffalo Steel Co.	19
Dominion Bridge Co.	18
Hamilton Iron & Steel Co.	
MacKinnon Holmes & Co.	
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H	19

Shovels (Steam)

Beatty & Sons, M.	15
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	

Safes and Vaults

Taylor, J & J	19

Stone Cutters

Bailey-Underwood Co.	62

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co.	34

Tiles

Smith Marble & Construction Co.	

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Marsh & Henthorn	53
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	19

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	
Standard Fitting & Valve Co	63

Ventilating System

Gardiner & Gaskill	

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	12

Wire Guards and Screens

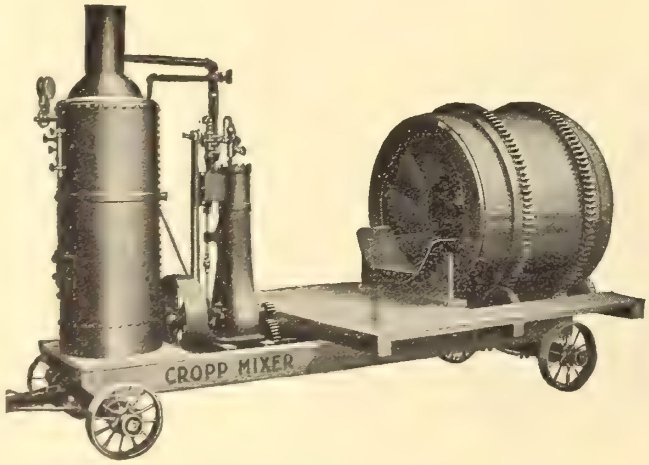
Canada Wire Goods Mfg. Co.	15

Water Wheels

Canadian Boving Co.	

The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co.,
84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

The Goods with a Record

Don

Bricks

- Pressed Bricks
- Enamelled Bricks
- Vitrified Bricks
- Porous Terra Cotta Bricks
- Wire-Cut Bricks

Fireproofing

- Arches
- Blocks
- Column Covering
- Furring

Don Valley products have been the leading building material for many years. Their value is known.

Don

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Chance's Figured Rolled Glass

has a smooth and bright surface for cutting, and a deep, sharply defined pattern which gives it a peculiar brilliancy. It cuts easier and looks better than other makes.

Chances Figured Rolled Pattern G
Registered No. 297,595

Chance's Figured Rolled Glass is made in white, blue, green, wine and amber, and in a great variety of patterns. "Pattern G," illustrated here, is a favorite with many architects.

To Architects, Builders and Contractors we will be glad to send, on request, samples, in a variety of tints, of Figured Rolled, Double Rolled Cathedral, Muffled and the new Flemish Glass, manufactured by Chance Bros. & Co., Limited, at their famous glass works near Birmingham, England.

Among the samples you will find glass suited for your very best work, and moderate in price. Write for them now.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

See it at the Toronto Exhibition

However difficult it might be to decide which was the **second best**

Double Wire Wound

Wood Stave Pipe

For Water Works Systems

everyone knows the **first best** is made by

The Dominion Wood Pipe Co.
Limited

A postal brings a catalogue

New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH MIXER
GOULD SHAPLEY & MUIR CO. LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

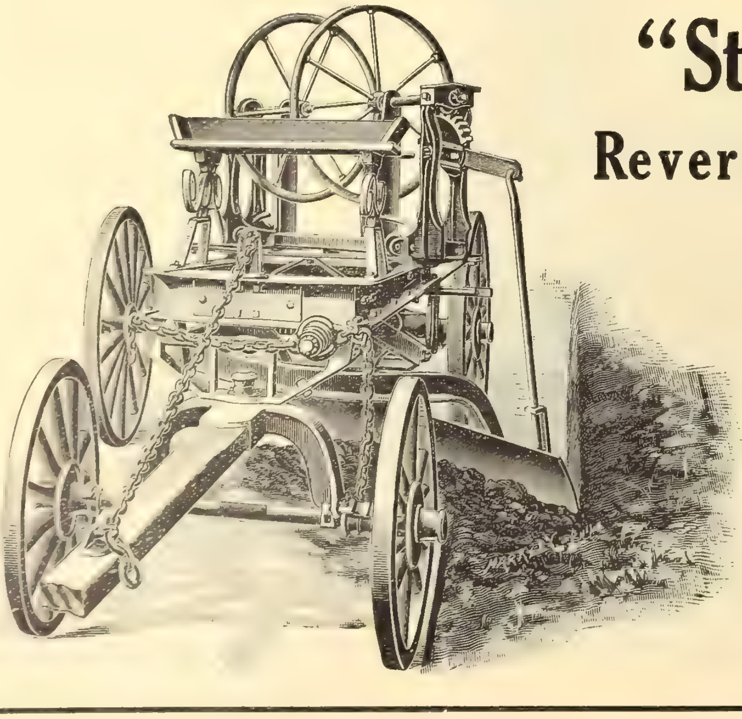
Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario
Designers and builders of road making and contractors machinery

"Brantford Specification" is now the choice of many builders and contractors

Easily and quickly laid

For stores, factories, and other buildings with flat roofs, Brantford Specification is particularly suitable. It makes a durable, lasting roof-protection at the minimum of expense.

Either Brantford ASPHALT Roofing or Brantford RUBBER Roofing is used for Brantford Specification. It is laid double, with Branroco Cement between laps. The nails are two to three inches apart and all nail heads are covered. By following our instructions for laying, the job can be easily and quickly done, and the roof made absolutely waterproof.

No coal tar is used for Brantford Specification. Coal tar gets soft and melts in summer, and becomes brittle and cracks in winter. Our satuation is 99 per cent. pure Asphalt. Asphalt of this quality and purity does not melt in summer nor crack in winter. It is the most durable saturation known.

The material for Brantford Specification retails from $5.00 to $7.50 per square, according to the thickness of the roofing. Brantford ASPHALT and Brantford RUBBER Roofing are both made in 1, 2 and 3 ply.

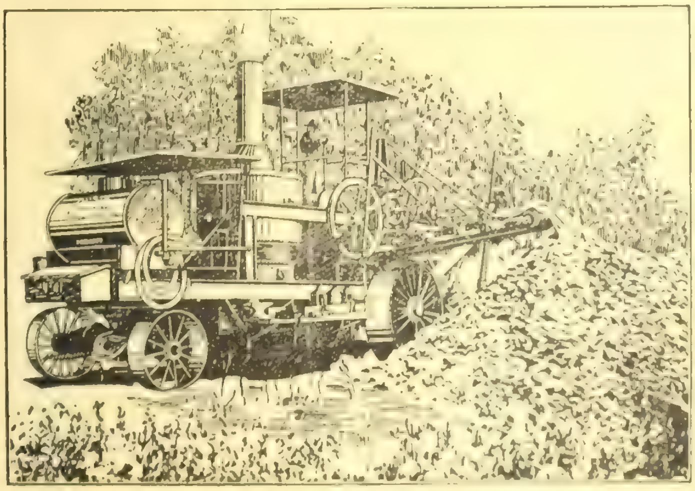
Further information about Brantford Specification will be promptly furnished on request.

Brantford Roofing Company, Limited
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.
MONTREAL

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

W. D. Beath & Son, Limited

Engineers and Manufacturers

TORONTO, ONT.

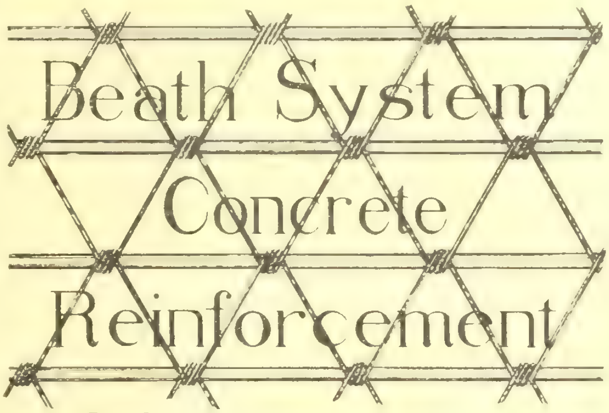
PRODUCTS

We are Engineers and Manufacturers of the "BEATH SYSTEM" of Concrete Reinforcement WIRE FABRIC for Floors, Roofs, Bridges, Dams, Sewer Pipe, Retaining Walls, etc. BEATH BARS for Beams, Columns and Girders. The Beath System is adapted for every form of Reinforced Concrete construction.

WIRE FABRIC

Made of cold drawn mild steel wire, guaranteed tensile strength, 90,000 lbs. elastic limit 50,000 lbs. per square inch.

Supplied regularly in rolls 150-ft., 500-ft. and 600-ft. in length, allowing continuous reinforcement over supports. Cut to special lengths if required.



Detail of Reinforcement. Style No. 23

Main stresses carried on heavy longitudinal or tension members. Diagonal cross wires provided to assist in longitudinal reinforcing, and at the same time distribute stresses to main tension members and take care of temperature stresses and strains.

ADVANTAGES

Provides more even distribution of steel reinforcing in every direction.
Tension or carrying members accurately spaced.
Most perfect mechanical bond.
No tying or lapping necessary.
Minimum cost of laying.
Easily handled and stored on the work.
Low cost of inspection.
Absolutely continuous action from end to end of structure.
Higher elastic limits with the same quality of steel due to cold drawing.
Every ounce of steel tested, as it cannot be cold drawn without showing defects, if any.
Diagonal cross wires distribute stresses due to concentrated load over a greater area.
The only design of fabric reinforcement where cross or diagonal wires assist longitudinal or tension members in carrying the load.
Supplied black or galvanized, but black is recommended owing to its better bond in concrete.

LONGITUDINALS SPACED 4-INCH CENTERS CROSS WIRES SPACED 4-INCH CENTERS

Number and Gauge of Wires, Areas per Foot, Width and Weights per 100 Square Feet.

Styles Marked * Usually Carried in stock.

Style Number	No. of Wires Each Long.	Gauge of Wire Each Long	Gauge of Cross Wires	Sectional Area Longs. Sq. In.	Sectional Area Cross Wires. Sq. In.	Cross Sectional Area per Ft. Width	Approximate Weight per 100 Sq. Ft.
4-A....	1	6	14	.087	.050	.102	53
5-A....	1	8	14	.062	.050	.077	44
6-A....	1	10	14	.043	.050	.058	37
* 7-A....	1	12	14	.026	.050	.041	31
23-A....	1	¼″	12½	.147	.076	.170	86
24-A....	1	4	12½	.119	.076	.142	76
25-A....	1	5	12½	.101	.076	.124	70
26-A....	1	6	12½	.087	.076	.110	64
27-A....	1	8	12½	.062	.076	.085	55
*28-A....	1	10	12½	.043	.076	.066	48
29-A....	1	12	12½	.026	.076	.049	42
31-A....	2	4	12½	.238	.076	.261	129
32-A....	2	5	12½	.202	.076	.225	107
33-A....	2	6	12½	.174	.076	.196	97
34-A....	2	8	12½	.124	.076	.146	78
35-A....	2	10	12½	.086	.076	.109	64
36-A....	2	12	12½	.052	.076	.075	52
38-A....	3	4	12½	.358	.076	.380	165
39-A....	3	5	12½	.303	.076	.325	146
40-A....	3	6	12½	.260	.076	.283	129
41-A....	3	8	12½	.185	.076	.208	101
42-A....	3	10	12½	.129	.076	.151	81
43-A....	3	12	12½	.078	.076	.101	62

Special Sizes on Application

Length of Rolls: 150 ft., 300 ft. and 600 ft.
Widths: 18-in., 22-in., 30-in., 34-in., 42-in., 46-in., 50-in., 54-in. and 58-in.

LONGITUDINALS SPACED 4-INCH CENTERS CROSS WIRES SPACED 2-INCH CENTERS

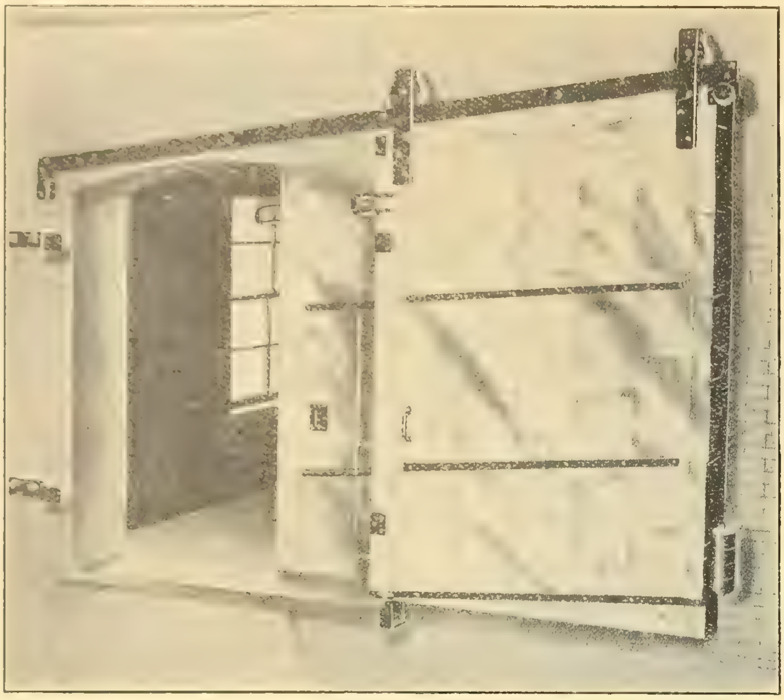
Number and Gauge of Wires, Areas per Foot, Width and Weights per 100 Square Feet.

Styles Marked * Usually Carried in stock.

Style Number	No. of Wires Each Long	Gauge of Wire Each Long	Gauge of Cross Wires	Sectional Area Longs. Sq. In	Sectional Area Cross Wires	Cross Sectional Area per Ft. Width	Approximate Weight per 100 Sq. Ft.
* 4......	1	6	14	.087	.025	.102	43
5	1	8	14	.062	.025	.077	34
6	1	10	14	.043	.025	.058	27
* 7	1	12	14	.026	.025	.041	21
*23......	1	¼″	12½	.147	.038	.170	72
24......	1	4	12½	.119	.038	.142	62
25......	1	5	12½	.101	.038	.124	[illegible]
*26......	1	6	12½	.087	.038	.110	[illegible]
*27	1	8	12½	.062	.038	.085	41
28......	1	10	12½	.043	.038	.066	[illegible]
29......	1	12	12½	.026	.038	.049	28
31	2	4	12½	.238	.038	[illegible]	[illegible]
32......	2	5	12½	.202	.038	.225	92
33......	2	6	12½	.174	.038	.196	82
34	2	8	12½	.124	.038	.146	63
35......	2	10	12½	.086	.038	[illegible]	50
36......	2	12	12½	.052	.038	.075	[illegible]
*38	3	4	12½	.358	.038	.380	[illegible]
39......	3	5	12½	.303	.038	.325	130
40	3	6	12½	.260	.038	.283	114
41......	3	8	12½	.185	.038	.208	87
*42......	3	10	12½	.129	.038	.151	[illegible]
43	3	12	12½	.078	.038	.101	47

Special Sizes on Application

Length of Rolls: 150-ft., 300-ft. and 600-ft.
Widths: 18-in., 22-in., 26-in., 30-in., 34-in., 38-in., 42-in., 46-in., 50-in., 54-in. and 58-in.



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

Sewer and Culvert Pipe

made of

FINE PLASTIC CLAY and WELL BURNED are about as DURABLE as the pyramids. They are the only class of pipe on which the ACIDS and GASES of SEWAGE HAS NO EFFECT. If you want a PERMANENT job and the kind of clay goods that are SURE TO PLEASE, write us for particulars.

Large Stock 4 inch to 24 inch, always on hand.

Telephone Toronto Connection, Parkdale 422.

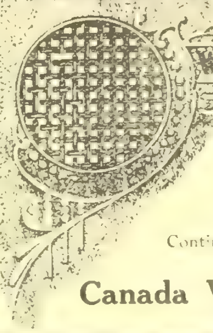
The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.



ORNAMENTAL IRON WORK
WIRE CLOTH AND WIRE GOODS

Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

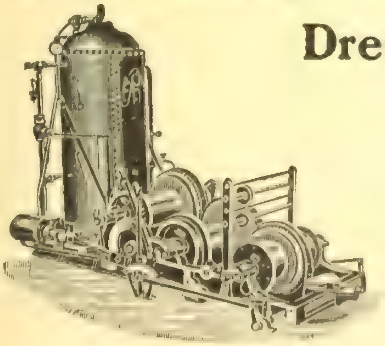
Write for Catalogue

Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery



"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

SAND AND GRAVEL

Lime Fire Clay Cement
Fire Brick Plaster Hair
Sewer Pipe Weeping Tile
Building and Crushed Stone

OUR PRICES ARE RIGHT AND OUR SERVICE GOOD

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North {664 665 Evenings, North {2107 658

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The **Dennis Wire & Iron Works Co.**
London, Canada Limited
Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

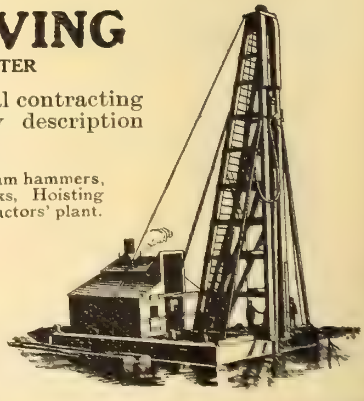
There is a Reason:
The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED
All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office : 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

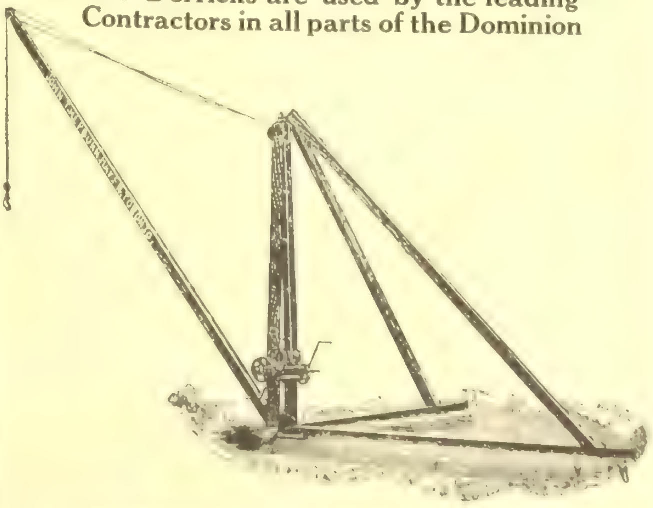
is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

Our Derricks are used by the leading Contractors in all parts of the Dominion



They are made in standard sizes from [illegible] ton capacities, three-way and double [illegible] base gears, band brake, and an ample length of best quality wire rope.

From first to last they are made from the finest materials, by our own workmen, and in our own shops.

They may be operated either by hand or power, and effect a labor-saving of fully fifty per cent over the old-style derrick.

JOHN T. HEPBURN
18-40 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

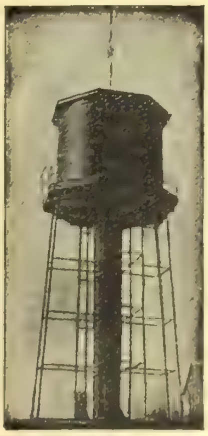
J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1040



Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

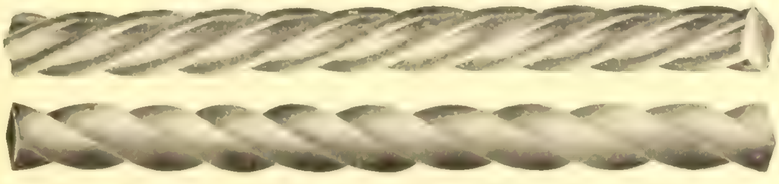
Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



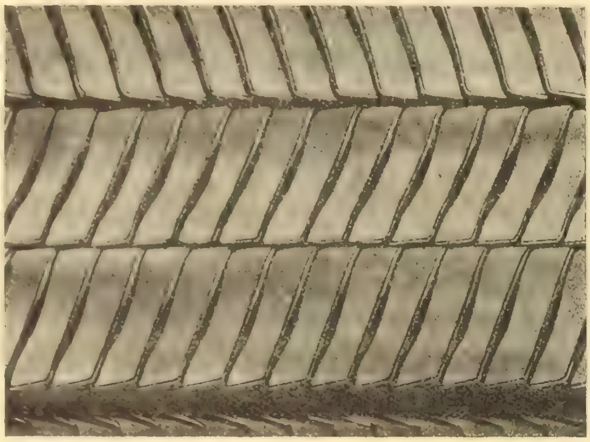
HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. (Suburb of Buffalo, N.Y.

Toronto Office
117 Home Life Building



The Herringbone Ribs

are the secret of Herringbone success

Each rib is a miniature beam adding its part to the total of Herringbone stiffness. At the edge of the sheet the ribs are selvages, locking the adjacent sheets together without waste. From the front they are baffles, pushing the excess of plaster back on the trowel. At the back they are shelves, sustaining the clinch and preventing mortar from dropping.

CLARENCE W. NOBLE
GENERAL AGENT SALES
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

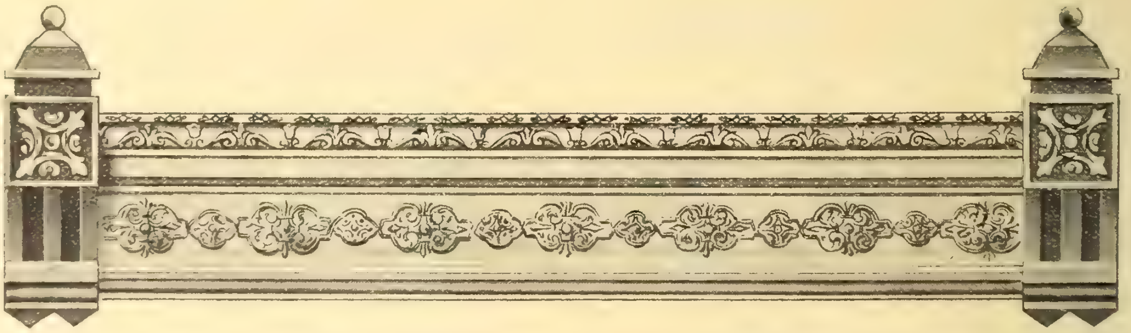
Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

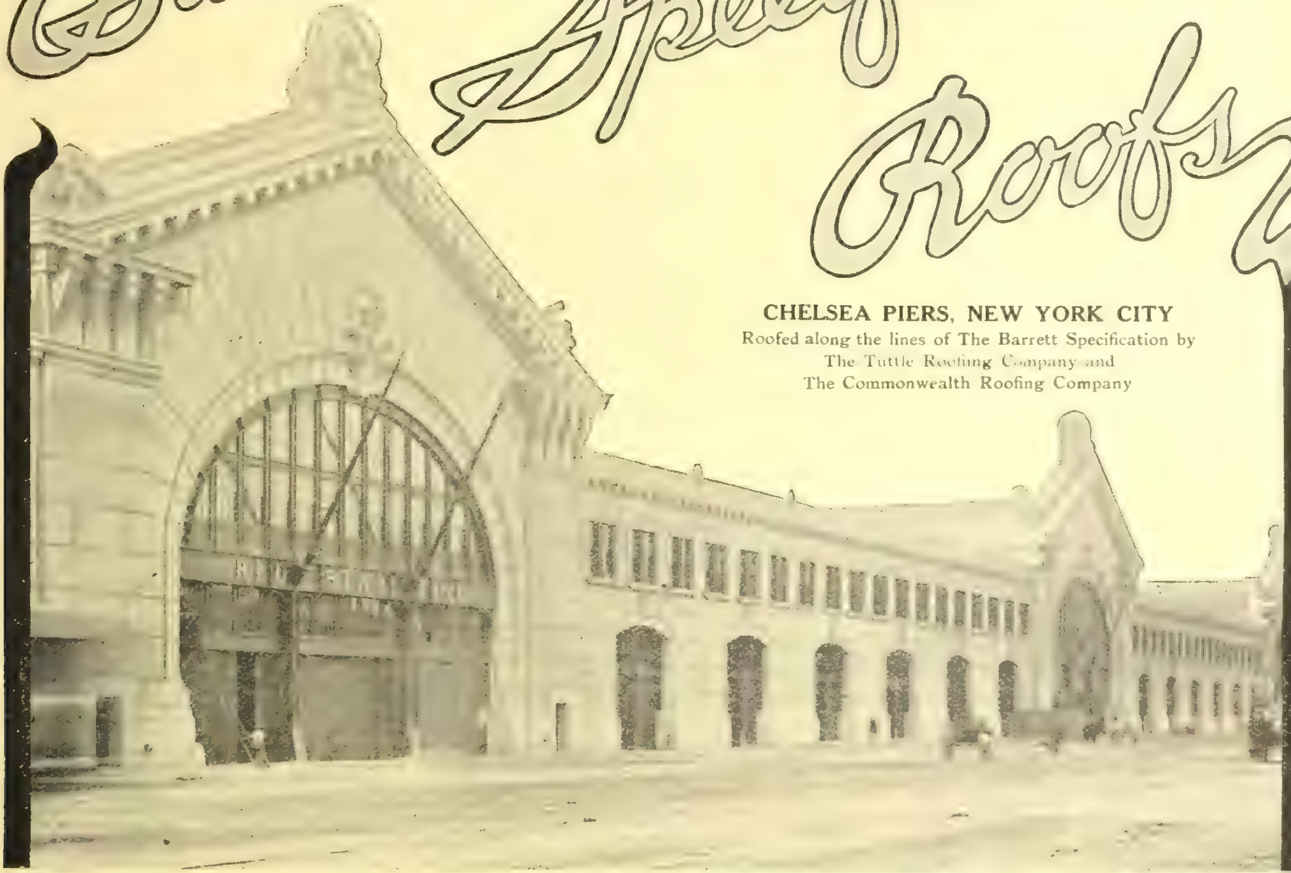


Expert Workmen Make Our Galvanized and Copper Cornices

Our Cornice Making Dept. contains the most modern machinery and is in charge of expert workmen. Every cornice we make for your contracts will be first-class in every particular—an ornament to the building on which it is erected. On request we will submit suitable designs. We will make to your order any style cornice you desire, in either copper or galvanized steel. Ask for our estimates. Our prices are always very reasonable.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Montreal, P. Q. **PRESTON, ONTARIO**

Barrett Specification Roofs



CHELSEA PIERS, NEW YORK CITY
Roofed along the lines of The Barrett Specification by
The Tuttle Roofing Company and
The Commonwealth Roofing Company

768,500 Square Feet of Roofing

First class buildings are almost invariably covered with Barrett Specification Roofs of coal tar pitch, tarred felt and gravel or slag.

This form of roofing has been in use for more than half a century.

Carefully figured side by side with other types of roofing, it is found that Barrett Specification Roofs give better protection at a lower cost per year than any other kind.

On account of this widely known fact, large areas are nearly always covered with roofs laid along the lines of The Barrett Specification.

For instance, the Chelsea Piers, one of which is shown above, which cover several city blocks along the North River, New York, carry 786,500 square feet of such roofs.

Other types of roofing are more commonly confined to buildings where ornament is a consideration, as in the case of tiling for steep roofs, or to small areas where the owner makes no calculation of the expense of maintenance.

When maintenance and depreciation are carefully considered, Barrett Specification Roofs are the first choice always.

A copy of The Barret Specification which describes with precision the proper method of laying such roofs, will be mailed free on request

The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.

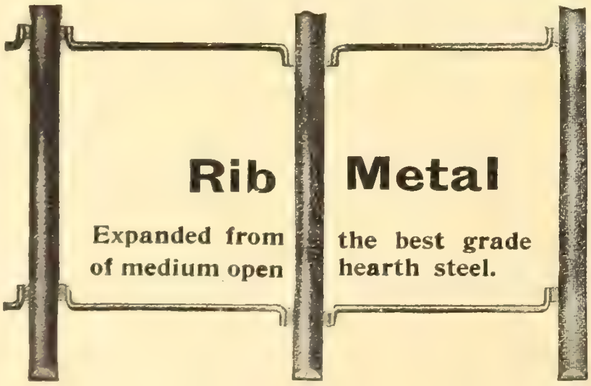
Metropolitan Building, NEW YORK.

Local Agents in Montreal, Toronto and Ottawa.

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.


Rib Metal
Expanded from of medium open the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

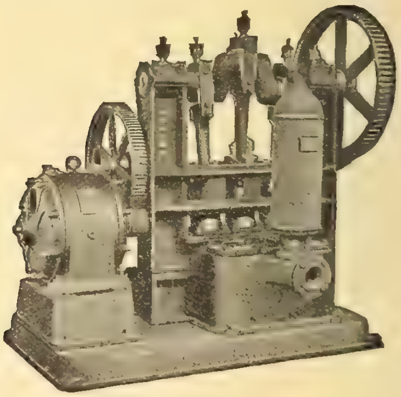
Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**

Phone Main 1054

Works: Seneca Falls, N.Y.

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

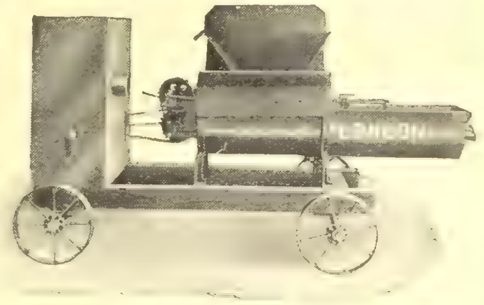
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers



Made in two sizes

No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money
On the first cost of machine
On cost of operation
On cost of mixing concrete

Our Automatic Machines do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired.

We also manufacture a Standard Drum Batch Mixer in three sizes, one-third yard, one-half yard and one yard. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell ns your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

Sash
Veneered Hardwood Doors
Pine Doors
Frames

Ceilings
Mouldings
Stairs
Pine and Hemlock

"Empire Brand"

Hardwood Flooring

We make a specialty of mixed cars of the above contractors' supplies which are made for those demanding perfectly manufactured goods.

Best facilities for prompt shipment.

J. R. Eaton & Sons

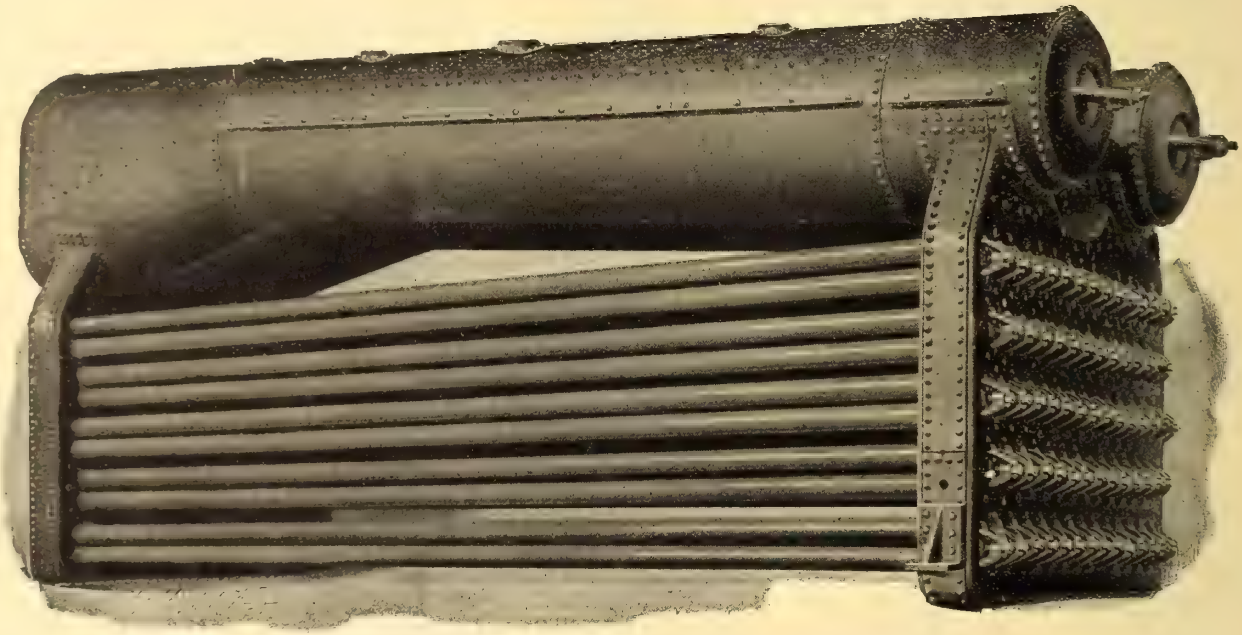
Orillia, Ontario

Montreal Agent: C. A. SPENCER, 55 St. Francois Xavier St.

Water Tube Boilers

that are

Economical



THE ERIE CITY WATER TUBE BOILER

Perfect combustion is the first step in the economical use of fuel; a glance at the above illustration will show you how carefully we have the heating surfaces arranged to secure that remarkable economy for which our water tube boilers are noted. We build these boilers for high pressure service in standard units from 100 to 500 H. P.

CATALOGUE UPON REQUEST

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Bradford, Ont.

Prof. Day and Engineer Baird gave a very encouraging report as to the feasability of draining the marsh land.

Belleville, Ont.

Tenders were invited until September 5th for construction of sewers for the following streets: William and Charles, Chatham, and Ann. Jas. G. Lindsay, city engineer.

Fort William, Ont.

See "Public Buildings."

Kingston, Ont.

The council defeated the motion for permanent pavements for this year.

Longueuil, Que.

The town of Longueuil are planning the extension of the present sewer system to meet the requirements of the new military barracks and school.

New Liskeard, Ont.

The waterworks extension by-law was carried.

Ottawa, Ont.

A conference is to be held between the city engineer and the fire chief in regard to the purchase of more hydrants.

Tenders addressed to the Board of Control will be received until September 18th for asphalt pavement on Wellington, Flora, Melgund and Anne. Specifications at City Engineer Ker's drafting office.

Sydney, N.S.

Two hundred feet of concrete sidewalks is to be laid on Dorchester street this month, as well as 1,300 feet combined curb and gutter on George street.

Extensions to the water main at Sydney will shortly be made to the extent of half a mile, under the supervision of D. McD. Cameron, city engineer.

Trenton, Ont.

Tenders addressed to G. W. Ostrom, town clerk, will be received until September 19 for construction of sedimentation tank in concrete and providing and laying sewers: 890 feet of 15 inch, 665 feet of 12 inch, 987 feet of 8 inch. Plans, etc., at the offices of the engineer or town clerk. Engineer, T. Aird Murray, 303 Lumsden Building, Toronto.

Virden, Man.

Tenders addressed to J. F. C. Menlove, secretary-treasurer, will be received until September 15th for grading and gravelling of road, etc. Specifications at municipal office.

Vancouver, B.C.

The following tenders were referred to the city engineer for tabulation: Second avenue paving, Hassam Paving Company, $61,000; bithulithic paving of Tenth avenue, from Granville street to Laurel avenue, Warren Construction Company, $35,547; wood block paving Fourth avenue, from Cedar to Maple streets, Palmer Bros. & Henning, $21,800; M. P. Cotton & Company, $22,255; two and one-half miles of concrete work, M. P. Cotton & Company, 15 cents per square foot. For sewer pipe, according to specifications submitted:—Evans, Coleman & Evans, vitrified pipe, 3-foot lengths, 10-inch, 29½ cents; 12-inch, 37 cents; 14-inch, 55 cents; 18-inch, 80 cents; 20-inch, $1.14½; 24-inch, $1.99½. Dominion Glazed Cement Pipe Company, cement pipe, 2-foot lengths, 10-inch, 39 cents; 12-inch, 50 cents; 14-inch, 75 cents; 16-inch, 95 cents; 18-inch, $1.20; 20-inch, $1.50; 24-inch, $2.25.

City Engineer Celment has recommended the construction of a pipe sewer of the combined system, varying in size from 12 to 18 inches in diameter, in the lane east of Granville street from Georgia to Pacific, westerly along Pacific to Granville street. (Passed.) A sewer was also recommended to be placed on Glen drive, from Eighth to Fifteenth avenues, varying in size from 18 to 36 inches. Probable cost of this work is $18,400. A 42-inch sewer will be constructed on Semlin drive, from Triumph to Pandora streets, to cost approximately $5,000. This sewer will be constructed of brick and tile.

Winnipeg, Man.

The city council will purchase ten or more deodorizers at $75 each, and will pay 20 cents per day per machine while the machines are under test.

AWARDED.

New Westminster, B.C.

The contract of the Hassam Paving Company at $62,800 for Columbia street, etc., was accepted.

Prince Rupert, B.C.

Contract for plank roadway was given to La Trace at $782.45, and the grading to Swanson at $3,822. In the latter the city engineer tendered at $4,000.

Saskatoon, Sask.

Harry Welch, this city, was given the contract for laying water mains and sewer pipe at $1,045, or $2.90 per lineal foot.

St. Catharines, Ont.

The tender of Thos. Riley for the construction of the following sewers was accepted: Louisa street, $1,650; Lake avenue, $1,200; Edmond street, $644. Manholes for the above sewers, $9.65.

Toronto, Ont.

The contract for sewer construction in township of York was awarded to John Maguire, Spadina road, at $4,000. F. B. Goodman tendered at $4,330; E. J. Elliott at $4,079.

Railroads, Bridges and Wharves

Brockville, Ont.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until September 21st for the construction of pier here. Plans, etc., at office of J. G. Sing, district engineer, Toronto, and on application to local postmaster.

Battleford, Sask.

President Hays, G. T. P., is the authority for the statement that the line from Battleford to Wainwright will be started this fall. Surveys have been made and excellent grades secured.

Bonaventure, Que.

Tenders addressed to S. Poirier, secretary-treasurer, will be received until September 12th for construction of two concrete pillars on the Bonaventure river, in preparation for construction of iron bridge. Plans, etc., on application to the above mentioned, or to the Department of Public Works, Quebec.

Cochrane, Ont.

Tenders addressed to P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, will be received until September 14th for approximately 7,543 gross tons of 80-lb. steel rails with the necessary rail fastenings delivered f.o.b. on or before October 1st.

Edison, Alta.

"See Business Buildings, Awarded."

Fredericton, N.B.

Tenders are being invited by Public Works Department for construction of Porter Milstream Mouth bridge in Charlotte county. Chief Commissioner Morrissy.

Galt, Ont.

Tenders were received up to September 2nd for the piers and abutments for a Grand river bridge.

Hamilton, Ont.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until September 28th for construction of wharf and two retaining walls here. Plans, etc., at above Department and at the offices of H. J. Lamb, district engineer, London; J. G. Sing, Toronto, and on application to local postmaster.

London, Ont.

City Engineer Wright has been instructed to prepare estimates of the cost of a bridge at the Wharncliffe road, connecting South and West London, and the council was recommended to submit a by-law to the people next January to raise funds for this purpose.

Montreal, Que.

It is reported that a new wharf will be constructed at St. Helen's Island this fall.

Owen Sound, Ont.

Mr. John B. Tanner, of the firm of Nau, Tanner & Rusk, Cleveland, Ohio, has been here in connection with the project of connecting Meaford and this place by rail. Noted previously.

Penticton, B.C.

The by-law granting $25,000 to the Kettle Valley Railway has been carried. The measure was passed on an understanding with President Warren that the town would be a divisional point and extensive yards and car shops would be constructed there.

St. John, N.B.

Sir Robert Perks and Hon. Mr. Pugsley will confer here in regard to the site for the proposed dry docks at St. John.

Sydney, N.S.

Tenders have been called by the city for the construction of a 200-foot steel bridge to be built over the river on Whitney avenue.

Victoria, B.C.

See "Business Buildings."

Vancouver, B.C.

Plans have been practically completed for the causeway to be built over Coal Harbor, but have yet to be accepted by the council. According to the plans as prepared by the city engineer's office, the causeway will be 150 feet wide, sufficient room to allow of two concrete walks 20 feet wide, two boulevards 20½ feet wide and a roadway of 64 feet. The outer or retaining walls will be constructed of stone, and the centre portion filled with earth. Total expenditure, $100,000.

Plans and estimates covering the proposed viaducts connecting Georgia and Harris streets and Dunsmuir and Keefer streets, have been placed before the council committee and are as follows: No. 1.—Georgia street to Harris street, with 42-foot clear roadway, two seven-foot sidewalks and double track tramline, $415,000; No. 2.—Similar to No. 1 except as to provision of 50-foot roadway, $459,000; No. 3.—Dunsmuir street to Keefer street, with 42-foot roadway, two seven-foot sidewalks and double track tramline, $350,000; No. 4.—Similar to No. 3 except with provision for 50-foot roadway, $387,000; No. 5.—Similar to No. 3 with omission of tramline, $281,000; No. 6.—Similar to No. 4 with omission of tramline, $313,000. The above estimates are stated to cover the entire cost of the structures, engineering expenses, etc., but do not take into account the expenditure for necessary land or compensation for buildings to be altered, etc.

Wallaceburg, Ont.

Tenders are being called until September 10th for erection of two steel bridges. H. E. Johnson, town clerk. For particulars see advertisement in "Tenders and For Sale Department" of this issue.

West Toronto, Ont.

Plans for the substitution of subways for the level crossings at Elizabeth street, Scarlett road and Jane street have been submitted to the Council of the Township of York.

Winnipeg, Man.

The main plans for the viaduct for the C. N. R. from the new Assiniboine bridge to the present right of way along the Red river have been approved by the civic committee.

AWARDED.

Cornwall, Ont.

Mr. G. R. Phillips, of Cornwall, has been awarded the contract for building a large wharf at Metasquan, Saguenay county, Que., by the Dominion Government. The wharf will be 400 feet long, and 30 x 20 feet in width. The work on the wharf at Metashquan will not be commenced until next spring.

Toronto, Ont.

E. C. Lewis, 16 Close avenue, has the contract for filling and grading the approaches to a concrete bridge over the Humber river at 70 cents a cubic yard for filling and $1.50 a cubic yard for gravel surface. Messrs. Barber & Young, York county engineers.

Weston, Ont.

E. C. Lewis was awarded the contract for the Weston road viaduct at $17,066. The city engineer's tender was over $19,000.

Public Buildings, Churches, Schools, etc.

Antigonish, N.S.

St. Francis Xavier College are building a science building here to cost over $50,000. It is 100 by 50 feet, 3 storeys, of brick and stone. J. A. Schweinfurth, of Boston, Mass., is the architect, and the contractors are McNeill Bros., also of that city.

Chilliwack, B.C.

Thos. Hooper, of Vancouver, has been appointed architect for the City Hall.

Carleton Place, Ont.

C. J. Burritt, architect, Ottawa, Ont., is preparing plans for a new Masonic hall at Carleton Place, to be of brick, trimmed with stone.

Durham, Ont.

See "Business Buildings."

Fort William, Ont.

Tenders addressed to R. E. Mason, architect, were called until September 3rd for erection of skating and curling rink.

By-laws to raise money for civic improvements will be submitted shortly and are as follows: $16,000 to improve and enlarge the central and ward four fire halls; $7,000 for cemetery purposes; $65,000 for a court house and police station (building and site); $14,000 for extensions to the water works; $22,000 for improvements to certain streets; $12,000 for improvements to the city hall.

Galt, Ont.

Tenders will be received until September 10th for the erection of a vault in the town hall. Edw. O. Fuce, town engineer.

Haileybury, Ont.

Moran, McPhail & Thompson are the architects for a stone church here for the erection of which tenders were called on the 1st inst.

Kingston, Ont.

Tenders are being called until September 20th for the trades required in the erection of the Nicol Building for the School of Mining and Agriculture. Power & Son, architects. Advertisement in "Tenders and For Sale Department" of this issue.

The dormitory at Royal Military College will have to be extended. Present plan of extension disapproved by public works chief architect.

Levis, Que.

Fire damaged to the extent of $3,000 the east wing of St. Joseph de la Deliverance.

Montreal, Que.

The $200,000 required for the Notre Dame Hospital has been secured. Judge Loranger is authority for the statement that the old one will be renovated to be used until the new one seems feasible.

Further extensions and deeper foundations will have to be made in connection with the erection of Montreal General Hospital's new buildings on Dorchester street, and when the work is completed it will cost $700,000. The extra expenditure will be raised by public subscription. Architects, E. & W. S. Waxwell, 6 Beaver Hall Square. General contractors, John Stewart & Company.

Prince Rupert, B.C.

Plans for the first section of the quarantine station for Prince Rupert are under consideration. Estimated expenditure, $25,000. Director of Public Health for the Dominion, Dr. Montizambert; Dr. A. T. Watt, Superintendent of William Head Quarantine Station.

Quebec, Que.

Tenders addressed to Hon. L. A. Taschereau, Minister of Public Works, will be received until September 17th for construction of new library annexed to present Quebec Parliament Buildings. Plans, etc., at office of Messrs. Marchand & Tanguay, associate architects, Quebec. Alph. Gagnon, secretary, Department of Public Works.

Saskatoon, Sask.

Architects E. & W. S. Maxwell, Montreal, Que., are preparing plans and specifications for the erection of a Roman Catholic Cathedral.

Swift Current, Sask.

A by-law to raise funds for a hospital here will be submitted to the ratepayers shortly. It is estimated that $25,000 will be required.

Sydney, N.S.

Tenders addressed to J. J. Curry, secretary, Public School Board, were called until August 29th for work required in Central school.

The congregation of St. Andrew's Presbyterian Church are at present building a new edifice which, when completed, will be one of the finest in Sydney. It is being built of brick, with stone facings. Rhodes, Curry & Company are the contractors.

Alterations to the town hall, Sydney, N.S., are about to be made. The interior will be remodelled and general repairs effected to the exterior.

Toronto, Ont.

Permits for two buildings for the new Toronto General Hospital were issued. One is the emergency building, basement and one storey, to cost $30,000. The other is the out-patients' building, basement and two storeys, to cost $100,000. The material will be steel, brick, and terra cotta.

Tenders for construction of bird and monkey house at Riverdale Zoo are being called until September 13th. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders are being called for erection of Manning avenue school until September 9. W. C. Wilkinson, secretary-treasurer. Advertisement in "Tenders and For Sale Department" of this issue.

Victoria, B.C.

Tenders have been invited by the provincial public works department for the erection of new school houses at Langley, Okanagan Landing and Yale Road.

Welland, Ont.

Architect Pont, of Welland, is now engaged preparing plans for a new rink to place the one destroyed by fire a year o.

AWARDED.

.berni, B.C.

The contract for the erection of an adtion and for general improvements to e Alberni public shcools has been award- to B. Woram.

ıfield, N.S.

T. O. Clatworthy Hampton was awarded e contract for erection of school in S. S. o. 15 Darlington, at $1,900.

P. Pascoe, secretary, writes that work ıs ceased and the school will not like- be built this fall.

ethbridge, Alta.

The contract for erecting the Fleetwood hool was awarded to Smith Bros. & Wiln, material stone, $55,050. With conete blocks the amount would have been i4.250. Others tendered on stone as folws: W. Rex Virtue, $56,553; D. E. Wiln, $59,000; Doyle & Thomas, $61,624. On ncrete blocks, W. Rex Virtue, $53,128; . E. Wilson, $56,000; Doyle & Thomas, $58,24. The contract for plumbing and heatg was awarded to the Standard Plumbg Company at $12,637. Others tendered follows: Wm. Head & Company, $12,99; Western Plumbing Company, $13,295; ick-Sehl Hardware Company, $13,387.

ontreal, Que.

Martineau & Prenoveau have been warded the contract for alterations to the roperty of the Fabrique de L'Enfant esus. Architect, Joseph Venne.

oose Jaw, Sask.

The contract for the Market building as given to Navin Bros. for the sum of 20,100, and the heating and plumbing of e buildings will be carired out by Frost ros. at a cost of $2,100.

orth Toronto, Ont.

The following is the list of successful nderers for new school at Bedford Park: asonry, Mr. H. Jennings, $8,172; plasterg, F. Goulding, $1,175; heating, Mr. Gray, 1,143.78; plumbing, Mr. Gray, $343; ainting, Mr. Hubbard, $315; carpentering, essrs. Baxter & Skipper, $4,300; metal ısh, $318; and finishing hardware, $100. otal, $16,156.78.

uesnel, B.C.

John Strand, a local builder, will contruct the new hospital. Estimated outy, $3,000; The outlay will be about $3,00, practically all of which has been colected or subscribed.

oronto, Ont.

The Board of Control awarded the folwing contracts for the construction of he new telegraph fire alarm building and ffices for the Fire Department on Adelaide treet west. Alarm Building — Masonry, ohn McMurren, $10,373; plastering, Hodge Son, $2,510; roofing, Mathews, Limited, 1,238; painting and glazing, W. H. Johnton, $838; electric wiring, W. J. Maguire, 141; plumbing, Fred Armstrong Company, 493; heating, Bennett & Wright, $893; iling, Vokes Hardware Company, $122; otal, $16,613. For the office building— asonry, Fussell & Thomas, $9,611; paintng and glazing, H. W. Johnston, $387; oofing, Reggin & Spence, $224; plumbing, red Armstrong Company, $772; plastering, Beame & Company, $1,050; electric viring, W. J. Maguire, $129; tiling, Vokes ardware Company, $111; total, $13,081

Residences

Hamilton, Ont.

The following building permits have been issued: Wm. Lyon, two brick dwellings, Argue street, $4,400; James Bryers, brick dwelling, Fairleigh crescent, south of Delaware avenue, for C. V. Laings, $3,200.

Montreal, Que.

Mr. Alphone Piche, architect, Victoria Building, has prepared plans and specifications and tenders are being invited for the erection of two cottages at Belisle, Que., for Mr. A. Martel.

Ottawa, Ont.

Recent building permits include: Dr. J. E. Taggart, brick and concrete dwelling, Clemow avenue, $12,500; T. J. Somerville, two detached dwellings, Spadina avenue, $4,000; Dr. M. O. Klotz, alterations to dwelling and surgery, Somerset street, $2,000; T. C. James, solid brick dwelling, Canal street, $12,000; Patrick Finn, alterations to dwelling, Rosedale avenue, $2,400; H. L. Morrison, brick veneer dwelling, Ossington avenue, $2,000; O. K. McDonald, brick veneer dwelling, Arlington avenue, $2,500.

St. Catharines, Ont.

Tenders will be received until September 7th for the trades required in the erection of a residence for Dr. W. J. Chapman, on Church street, and also for improvements on frame house on the same premises. T. H. Wiley, architect.

Winnipeg, Man.

Permit was issued to C. S. Shipman, apartment house, on Bannatyne, $50,000.

AWARDED.

Edmonton, Alta.

The contract for First Presbyterian Church manse has been awarded to Grant & Company, Strathcona. Wilson & Herrald, architects.

Strathcona, Alta.

The contract for a residence here for Mr. J. W. Tipton was awarded to Grant & Company. Wilson & Herrald, this city, architects.

Business Buildings and Industrial Plants

Alberni, B.C.

The recently formed merger of four of the largest lumber companies in this province, known as the Canadian Pacific Lumber Company (capital, $5,000,000), it is stated, will erect at New Alberni a large mill upon the completion of the E. & N. Railway extension from Nanaimo. The following companies are included: Canadian Pacific Lumber Company, of Port Moody, the Barkley Sound Cedar Company, of Port Alberni, the Anglo-American Lumber Company, Vancouver, and the Gibbons Lumber Mills, Arrow Lakes.

Berthier, Que.

Fire caused $30,000 loss to Mr. J. D. Chenard's saw mills at Berthier, Que., on the 31st ulto.

Dominion City, Man.

The Ridgeville Hotel and two unoccupied stores adjoining, were completely destroyed by fire on the 31st ulto.

Durham, Ont.

By-laws granting a loan of $20,000 and exemption from taxation to the Durham Furniture Company for extension of their business and one for the purchase of a new market site were carried.

Fournier, Ont.

The store of J. M. Lapointe (loss, $5,000) with other buildings were destroyed by fire on the 29th ulto.

Hamilton, Ont.

Plans for the new addition to the Pure Milk Corporation's plant have been prepared by Mr. A. F. Peene, architect. Contracts have also been let.

The Hamilton Bridge Works Company has taken out a permit for the erection of a concrete and steel addition to its factory building on Tiffany street, to cost $10,000.

Kingston, Ont.

Fire destroyed the Moscow Cheese and Butter Factory, owned by F. P. Johnson, on the 2nd inst.

Maisonneuve, Que.

There will be a new shoe factory at the corner of Desjardins and Ernest avenues, owned by Mr. Stobbo, who also operates a factory in Quebec. Mr. Stobbo has been granted exemption from taxes for ten years on the understanding that the factory be commenced this fall.

Montreal, Que.

The stables and grand stand of the Delorimier Park racing track were destroyed by fire on the 1st inst.

Plans and specifications for the new building to be erected for the National Acme Manufacturing Company, Ontario street east, may be seen in the office of Mr. E. L. Baugh, 107 St. James street. Noted previously.

Building Inspector Chausse has received an application from a large firm in Fort William, for a permit to erect a grain storage warehouse and elevator on the canal bank at the foot of Dominion street, west Wellington bridge.

Plans for the elevated entrance of the G. T. R. Company to their Bonaventure station are nearing completion and will be submitted to the Railway Commission at an early date. Should this important work go through, it will mean the erecting of a mammoth station to replace the present Bonaventure station which has been contemplated for some time and considered most likely in view of the fact that the company own the adjoining properties on Chaboillez Square, Cathedral and St. James streets.

New Liskeard, Ont.

J. P. McLaren, architect, Ottawa, is calling for tenders until September 14th for a bank building.

The by-law to guarantee the bonds of C. B. Mathews, who was to erect a flour mill, was defeated.

North Vancouver, B.C.

The B. C. E. R. Company will erect a large and commodious barn for the storage of twelve cars. The work will be commenced without delay.

New Glasgow, N.S.

W. P. McNeil & Company, of New Glasgow, N.S., the well-known firm of Eastern Provinces Bridge Builders, are [illegible] a large addition to their plant which will treble the present capacity. [illegible] electric cranes have been installed in the [illegible] building, which are operated by the company's own electrical plant. [illegible] the handling of stock. This company has a number of large contracts on hand for this year.

Penticton, B.C.
See "Railroads."

Phoenix, B.C.
It is stated that the Granby Company will rebuild their buildings recently destroyed by fire.

Portage la Prairie, Man.
Mr. H. E. Finch, manager of the Rogers Fruit Company, Grand Forks, is the authority for the statement that the postponement of their plans for building here was only temporary.

The plans for the new Hart Parr building have been returned to the architect, Mr. C. H. Mounsey, with the statement that the building will not take place this fall, owing to the time of the year. The contractors of this city who have submitted the tenders have had them returned with their certified checks. Work will be started in the spring of 1911.

Port Arthur, Ont.
Negotiations between the city and T. McAvity & Sons, Limited, of St. John, N.B., for a factory site, have been concluded. The company will receive ten acres of waterfront property free, and exemption from taxation for twenty years, and other minor considerations, in return for which the city obtains an important iron industry to employ 500 hands. A by-law will be submitted to the people in September.

Saskatoon, Sask.
Brown & Vallance, Montreal, are the architects for the new hotel to be erected at the corner of Second avenue and 23rd street. Estimated expenditure, $250,000.

St. John, N.B.
The Asepto Soap Company have under consideration the addition of another storey on their building.

Four buildings were destroyed by fire on the 2nd inst. The following were the losers: Samuel Seel, Price & Shaw, the Maybee Woodworking Company, and the Maritime Rug Company. Total loss, $20,000.

Regina, Sask.
Architects Brown & Vallance, Montreal, are preparing plans and specifications for a warehouse and office building for Sir John Laing in Regina.

Arrangements are nearly completed for the establishment of a factory for the Wild Drug & Spice Company, of Minneapolis, Minn. Local capitalization, $10,000.

Victoria, B.C.
Following the visit of the president of the company, Mr. C. M. Hays, it is probable that the contract for the office building to face Wharf street will be let.

Vancouver, B.C.
Building permits were issued to the Royal Bank of Canada for an addition to its Westminster avenue branch, $25,000, and another to Dr. D. H. Wilson for the improvement of his property at Richards and Dunsmuir streets at a cost of $27,000.

Plans for the new Bank of Ottawa, corner of Seymour and Hastings streets, have been prepared by Architect W. Marbury Somerville, 43 Exchange Building, and call for eight storeys. Estimated expenditure, $25[illegible].

Winnipeg, Man.
A proposition is on foot to locate a big flax factory here. The site for the factory, it is stated, is assured. F. W. Heubach, C. N. Bell, W. Barry, of the Canada Paint Company, and G. F. Given, of Chicago, are interested.

Tenders addressed to the Chairman, Board of Control, will be received until September 8th for supply of labor and material for locomotive shed for C. P. R. J. D. Atchison, architect.

AWARDED.

Edison, Alta.
The contract for the construction of roundhouses, machine shops, and passenger station here, the first divisional point on the G. T. P. west of Edmonton, has been awarded to the May Construction Company, at a price approximating $75,000. Work is to be commenced at once on the new buildings. The station will be a large handsome building, and will cost about $15,000.

Montreal, Que.
J. B. Gratton, Limited, 8 Mercier street, have been awarded the contract for the erection of one storey factory building on Stadacona street, for Messrs. B. J. Goghlin Company, Limited. Architect, Gordon Mitchell, Royal Insurance Building.

C. E. Deakin has been awarded the general contract for the erection of a factory building on St. Ambroise street for Messrs. Marx-Rawollee Company of Canada, Limited. Architects, Messrs. Saxe & Archibald.

J. & W. Morrison has been awarded the general contract for the rebuilding of property at 12 Jurors street for Honorable Beck. Messrs. Hutchison, Wood & Millar, architects.

North Vancouver, B.C.
The Ferries Company has awarded the contract for its new offices at the North Vancouver wharf to Messrs. Tuck & Brewer, $5,000.

Walkerville, Ont.
Donaldson & Meier, 1314 Penobscot Building, Detroit, Mich., have let the following contracts for the 4-storey and basement brick addition, 60 x 130 feet, to the plant of Parke, Davis & Company, Walkerville, Ont., cost $32,000: Masonry, to Thompson Bros., 26 Pitt street, Windsor, Ont.; carpentry to Victor Williamson, Huron and Windsor roads, Walkerville, Ont.

Power Plants, Electricity and Telephones

Edmonton, Alta.
Reports to the Department of Public Works, Ottawa, with reference to the projected waterway from Winnipeg here, are to the effect that 80,000 h.p. can be harnessed at Grand Rapids, where the junction with Lake Winnipeg is effected. It is stated that this power is capable of development without difficulty and that in addition to stimulating local industry, it would be quite easy to transmit the electric energy to Winnipeg. Preliminary reports on the scheme from the eleven parties now in the field, are expected for the next session of Parliament.

Medicine Hat, Alta.
Time for receiving tenders for two d.c. gas engine driven, 125 kw. alternating current units has been extended to September 12th. M. A. Maxwell, consulting engineer.

Ottawa, Ont.
J. B. McRae has been chosen engineer for constructing new dams at the foot of Gull lake and Long lake on the Mississippi river, Ontario. These dams of concrete will replace the preesnt wooden structures. The power owners at Carleton Place, Almonte, and other points along the river are uniting in the work.

A new contract has been made by the Hydro-Electric Power Commission for the delivery of 1,500 addition horsepower to be used in Ottawa and Hull, the price to be $15 per horsepower. Some months ago the Power Commission contracted to deliver 1,500 horsepower to Ottawa, and this was used for municipal purposes, such as lighting, etc. Later the order was increased by 1,000 horsepower. The present order will bring the total delivery up to 4,000 horsepower.

Orillia, Ont.
At a recent meeting of the council it was decided to spend immediately $10,000 in improving the power plant. A by-law will be submitted to the ratepayers asking them to authorize the expenditure. The installation of a new unit and greater wheel capacity must, however, follow within a year or two, and this will entail a probable expenditure of from $25,000 to $30,000.

Pasqua, Sask.
Tenders addressed to C. A. Mills, secretary Pasqua Southeastern Telephone Company, Limited, will be received until September 10th for construction and installing of telephone line of about 11 miles.

Port Burwell, Ont.
The Dominion Gas Company, of Hamilton, have been successful in striking gas three miles from here. The output is estimated at over 3,000,000 per hour. It is proposed to pipe to Tillsonburg and other points.

Regina, Sask.
Extensions to the light and power plant are considered. City Electrician Bull has a report. It is possible much new equipment will be needed.

St. Thomas, Ont.
At the meeting of the council, Alderman Price and Alderman Chant were authorized to continue the negotiations with Port Stanley in regard to the furnishing of that municipality with power.

Stellarton, N.S.
The Acadia Coal Company, Limited, of Stellarton, N.S., are contemplating the installation of a 2,200 kilowatt electric plant at what is known as the Allan Shaft in Stellarton, to be used in driving their machinery and for general lifting purposes. Should the plan mature this will prove the largest electric plant east of Halifax.

AWARDED.

Ottawa, Ont.
The civic commission has awarded the following contracts for the new conduit from the power station in Hull to the distributing station on Laurier avenue: For transformers, Canadian General Electric Company, $12,000; cable, British Insulated Cable Company, Montreal, $16,246; conduit pipe, Eadie-Douglas Company, Limited, $2,704; manhole covers, J. B. Maclaren, Ottawa, 2¼ cents per pound for cast iron, and $35 per ton for rails.

St. Thomas, Ont.
The tender of the Canadian General Electric Company for supplying new transformers and purchasing 132 old ones for the local hydro-electric distributing plant was acepted, it being the most favorable of three others. The amount involved is about $15,000.

Miscellaneous

Montreal, Que.

Recent building permits include: Leon Chaput, 83 First avenue, Emard Ward, two houses containing six dwellings, $9,000; Isaie Denis, 1360 Chapleau street, house containing five dwellings on Papineau avenue, $4,500; Felix Hurtubise, 1326 St. Hubert street, two houses containing two dwellings on Alfred street, $3,000; N. Beauchamp, 299 La Salle avenue, two houses containing four dwellings on La Salle avenue, $4,000; J. Lamoureux, 1697 Cadieux street, house containing three dwelings on Clark street, $3,500; J. Riopel, 2816 St. Lawrence Boulevard, house containing four dwellings on Clark street, $4,000; B. J. Coghlin & Company, 432 St. Paul street, a one storey factory building on Stadacona street, $2,500; W. Signer, 228 St. Dominique street, house containing two dwellings on Boyer street, $2,500; H. Frey, 1720 St. Urbain street, house containing two dwellings and store on St. Lawrence Boulevard, $4,000; Jos. Mailloux, 82 Dufferin street, house containing three dwellings on Delorimier avenue, $4,600; O. Champagne, 600 Labelle street, two houses containing four dwellings on Huntley street, $4,000; L. Belisle, 1438 Simard street, house containing two dwellings at 532 Simard street, $2,800; F. Lapointe, 625 St. Catherine street east, house containing six dwellings on Labelle street, $7,000; L. Paquin, 1093 Cartier street, house containing five dwellings on Cartier street, $4,000; Wilf Tardif, 115 Wm. David, Maisonneuve, two houses containing twelve dwellings 86 Marguerite street, $9,000; Marx-Rawolle Company, of Canada, Limited, a two storey factory on St. Ambroise street, $19,580; Jos. Perron, St. Hubert street, house containing two dwellings on Beaubien street, $2,500; D. Lesiege, 285 St. Dominique street, two houses containing two dwellings on St. Lawrence Boulevard, $8,600; Federal Lumber Company, 1017 Ontario street east, house containing six dwellings, 191 Dorion street, $5,000; Jos. Chartrand, 689 Mount Royal east, house containing five dwellings on Breboeuf street, $4,000; N. Fournier, 2677 Esplanade avenue, two houses containing four dwellings, $4,000; A. Chausse, 1337 Delorimier avenue, house containing five dwellings on Delorimier avenue, $5,000; D. Mainville, 208 Montgomery street, house containing three dwellings, $3,000; O. Masson, 234 Delorimier avenue, house containing three dwellings on Dorion street, $3,000; O. Perreault, 998 Lofontaine Park, house containing three dwellings on Dorion street, $3,000; D. Blay, 89 Dagenais street, four houses containing twelve dwellings on St. Phillipe street, $10,000; Ideal Savings, Loan & Land Company, 292 St. Catherine street west, house containing store and dwelling, Cote Visitation road, $2,000; A. Leger, 2339 Notre Dame street west, house containing three dwellings on Parc Etienne Cartier, $5,000; Hon. Adam Beck, London, Ont., rebuilding of property at 12 Jurors street, $19,000; James Gardiner, 311 Stanley street, alterations to property on Stanley street, $2,400; Fabrique de l'enfant Jesus, 1257 St. Dominique street, alterations to property on St. Dominique street, $8,597.

Valleyfield, Que.

Tenders for the construction of a reinforced concrete conduit across Beauharnois canal will be received until September 7th.

Vancouver, B.C.

Recent building permits include: Bratt & Son, 1557 Parker street, $3,000; Bentley & Wear, 2617 Fifth avenue west, $6,000; H. Goldie, 2455 Seventh avenue west, $2,600; D. H. Wilson, brick building for stores, Richards street, $27,000; F. A. Thompson, frame dwelling, 365 Twelfth avenue west, $6,000; W. H. Harcus, frame dwelling, 150 Fourteenth avenue west, $3,000; R. M. Finch, frame addition, 1535 Vine street, $2,500; P. H. Alder, frame dwelling, 1676 Eleventh avenue west, $5,000; Harvey Templer, frame dwelling, 2485 Sixth avenue west, $2,700.

Winnipeg, Man.

Recent building permits are as follows: St. Stephen's Church, alterations, $20,000; J. Thom, house, south side Alexander, between Nena and Tecumseh, $2,200; G. J. Seale, osuthwest corner Harvard and Rockwood, $3,900; G. Philip, house, north side Rosedale, between Lilac and Helen, $1,500; G. McAuley, house, west side of Alverstone, $3,500; G. F. Crawley, house, south side of Dorchester, between Lilac and Wentworth, $3,500.

New Companies

The Modern Power Company, $25,000 capital, Winnipeg. The directors are:—William Lloyd Williams, commercial printer; Victor Clark Parker, commercial printer, both of Winnipeg.

Winnipeg Steel Culvert Company, $60,000 capital, Winnipeg. The directors are: Percy S. Joel, accountant; Cecil L. Hamilton, clerk; Roy T. Pickard, real estate agent, all of Winnipeg.

Montreal Hydro-Electric Company, Limited, Montreal, Que., capital $10,000. Incorporators, Edouard F. Surveyor, K.C., Francis E. McKenna, notary, and Wm. R. Ford, clerk, all of Montreal.

The Ivel Motor Company, Limited, Winnipeg, Man., capital $300,000. Incorporators, James Stuart, merchant, and Edmund L. Taylor, barrister at law, both of Winnipeg.

Winnipeg Steel Culvert Company, Winnipeg, Man., capital $60,000. Incorporators, Herbert E. Swift, accountant, and John F. Waller, student at law, Winnipeg.

Canadian Railway Materials Company, Limited, Montreal, Que., capital $50,000. Incorporators, Pearl R. Diamond, manager, Wm. P. Robertson and Darley Burley-Smith, clerks, all of Montreal.

INVERTED MACADAM CONSTRUCTION.

In reply to a correspondent who asks for a description of so-called "inverted macadam construction," our contemporary, "Good Roads," gives the following interesting particulars:

The method of construction referred to is one which was advocated by A. N. Johnson, state highway engineer of Illinois, in a paper presented at a meeting of the Western Society of Engineers in October 1908. It differs from that ordinarily employed in that the first course is composed of fine material, and the wearing course of large pieces of stone to which a small amount of screenings is added after rolling.

According to Mr. Johnson's specifications a layer of crushed stone varying in size from 3-4 inch to 1½ inch is spread on the subgrade in the usual manner. It is then raked or harrowed in order to give the material an opportunity to follow the natural tendency to separate thoroughly compacted with a roller weighing not less than 10 tons.

The second course is made up of stones varying from 1½ to 3 inches in size, spread to a depth, after rolling, of 2 inches on 6-inch roads and 4 inches on 10-inch roads Rolling is carried on as before and is completed before the last course is put on.

The finishing course consists of screenings containing all the dust and including stones up to 1 inch. The screenings are spread in the same manner as the large stones, just enough being used to cover the surface.

The road is finished by rolling and watering, only a small amount of water being used at first to prevent its running through the stone and softening the foundation. The process is continued, additional screenings being put on, watered and compacted wherever the large stones appear at the surface.

Several advantages are claimed for this method of construction, among them the following. The principal function of the bottom course being to distribute the load over the foundation and not to withstand the wear of triffic, the cost may be reduced by using a stone of a quality inferior to that required for the wearing course. The arrangement of the metaling with the small particles at the bottom and the large at the top is in accordance with the natural tendency of similarly graded mixtures to so separate, hence it is argued that greater stability obtains. The same conditions makes possible a surface course made up of fragments of nearly equal sizes. As it has been observed that in a wearing surface in which the particles are graded the smaller ones are ground up first, this uniformity would, it is held, result in a more even wearing down. Furthermore the surface course might be expected to disintegrate more slowly both because the separate stones would grind up less rapidly on account of their large size, and because the interlocking of such pieces is more secure than that of smaller ones.

Roads have been built in this way by State Engineer Johnson and by others and are understood to have given satisfaction.

THE HUDSON BAY RAILWAY.

Strong pressure is being brought by the grain growing and other interests of the western Canadian provinces upon the Dominion Government for action which will bring about the early completion of the railway line to Hudson Bay. This matter was made the subject of earnest representations to the Premier, Sir Wilfrid Laurier, during his recent visit to Saskatchewan, the point being urged that what were equivalent to promises of governmental aid for the Hudson Bay project were largely instrumental in securing the adhesion of the western provinces to the Liberal party. Support from the provinces interested has been secured, but there seems to be some question as to whether the Dominion Government will extend its guarantee to the securities of the new road in a manner which will assure the completion of the project. The latter, in fact, is one which would hardly appeal to private capital. At the present time the Canadian Northern Railway Company has completed and operates a branch of some seventy miles from Hudson Bay Junction to The Pas Mission. From the latter point to Fort Churchill, the proposed terminus on Hudson Bay, is a distance of [illegible] miles, an dthe surveys of the route, it is declared, indicate that the construction work would be generally light, there being only two bridges of any size to be built on the entire line. One plan already suggested is for the erection at Fort Churchill of two large grain elevators with a capacity of eight to ten million bushels, the estimates for the entire work being that it would cost about $10,000,000.

Tenders and For Sale Department

Debentures for Sale

Sealed tenders will be received up till noon, WEDNESDAY, SEPTEMBER 14TH, 1910, for the purchase of $7,500.00 High School Debentures of the Town of Oshawa. Dated August [illegible] 1910, bearing interest at 4½ per cent. per annum and payable at the office of the Treasurer, Oshawa, in 30 equal annual payments of $460.45 of principal and interest. Accrued interest to be paid by the purchaser.

The highest or any tender not necessarily accepted.

THOS. MORRIS,
Town Clerk.
36

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

Friday Noon, September 9th

for the several trades required in the erection of

New School, Manning Avenue

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH,
Chairman of Committee.
Toronto, Ont.

W. C. WILKINSON,
Sec.-Treas.
36

Tenders for

Construction of Bird and Monkey House at Riverdale Park Zoo

Tenders addressed to the undersigned will be received by registered post only up to 12 o'clock noon on TUESDAY, SEPTEMBER 13TH, 1910, for the construction of a building in Riverdale Park for the City of Toronto, which building will be known as the "Bird and Monkey House."

Specifications may be seen and form of tender obtained, together with all information relative thereto, at the office of the Parks Department, City Hall, Toronto.

The usual conditions pertaining to tendering, as prescribed by city by-law, must be strictly complied with, and envelopes containing tenders must be plainly marked on the outside as to contents.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman of the Board of Control
City Hall, Toronto, September 2, 1910. 26

Tender for Steel Bridges

Tenders will be received up to and including the 10TH OF SEPTEMBER, 1910, for the erection of Two Steel Bridges, each 50 feet girders and 16 feet in width. Steel piles backed up with concrete and covering of concrete. Plans and specifications to be seen at the Clerk's Office, Monday, September 5th, 1910.

H. E. JOHNSON,
Town Clerk.
Wallaceburg, Ont. 36

To Contractors

The Reeve and Council of the Township of Morris, County of Huron, are asking for tenders for the construction of four large municipal drains.

Plans, profiles, specifications and estimates may be seen at the clerk's residence.

The tenders will be opened at the Council Chamber, Morris, on MONDAY, THE NINETEENTH DAY OF SEPTEMBER, 1910, at 2 o'clock p.m.

A. MacEWEN,
Clerk.
Bluevale, August 23rd, 1910. 36

To Contractors

Tenders will be received at the office of the Registrar, Queen's University, Kingston, up to 6 p.m. of TUESDAY, SEPTEMBER 20TH, for the several trades works required in the erection and completion of the Nicol Building for the Governors of the School of Mining and Agriculture.

Plans and specifications may be seen at the University and at the office of the undersigned.

The lowest or any tender not necessarily accepted.

POWER & SON, Architects,
Merchants' Bank Chambers.
Kingston, Ont. 37

Dredging Plant for Sale

The Toronto General Trusts Corporation, Executor of the estate of Charles E. Goad, will receive tenders for the purchase of a dredging plant and other supplies enumerated below:—

1 double drum engine; derrick scow, orange-peel bucket, chain and blocks complete; 1 engine; 1 drum, 1 steel scoop for dredging; 1 anchor; 1 cable, ¾'' wire, 750'; 1 cable, ½'' wire; 4 snatch blocks (in all); 1 wire, ¾'' (old), 200'; 1 anchor chain; 1 sail boat, 8' x 21'; 1 water pump (force); 3 split pulleys, 6'' x 30''; 1 sett chain blocks; 1 winch; 1 split pulley, 12'' x 12''; 1 split pulley, 6' x 12''; 1 weed cutter; 1 sett block and tackle.

Tenders to be addressed to the undersigned not later than the 10th of September, A.D. 1910, and to state cash offer.

Highest or any tender not necessarily accepted. For further particulars apply to

THE TORONTO GENERAL TRUSTS CORPORATION,
Executor and Trustee of the Estate of Charles E. Goad, 59 Yonge street, Toronto. 36

Dredging

Sealed tenders addressed to the Chairman of the Canal Committee of the Council of the Town of Dundas, will be received until SEPTEMBER 15TH, 1910, for Dredging the Desjardins Canal, in accordance with the Jennings award, involving the removal of about 27,500 cubic yards of material. The work to be completed by 1st December, 1910.

Tenders must be accompanied with a certified cheque payable to the order of the Chairman of the Canal Committee, for a sum equal to 5 per cent. of the tenders, respectively, as guarantee for the faithful performance of the contract.

The lowest or any tender not necessarily accepted. Plans and specifications may be seen at the office of

JOHN F. ARMOUR, C.E.,
36 Dundas.

Miscellaneous

Advertisement under this heading two cents a

STEAM HOIST FOR SALE.—Fifteen H.P. Steam Hoist, two cylinder, single reversible drum, manufactured by Georgian Bay Engine Works, complete with wire cable. Will accept reasonable offer for immediate sale. STINSON-REEB BUILDERS' SUPPLY COMPANY, Limited, 904 Eastern Townships Bank Building, Montreal, P.Q. 36

Excellent Suggestions for Fighting Fires

The Witness, of Montreal, Que., recently published a suggestion on the subject of fighting fire in large structures, which is of excellent value, and could easily and profitably be put into general use in the larger buildings. It consists of designing a card outlining the buildings, each building to have such a card located in a known place for the benefit of the firemen. This card would show at a glance the location of trap doors, elevator shafts, stairways, heavy materials, valuable stock, dangerous or explosive stock, safes or vaults, gas cocks, electric switches, engine or power plants, and all other information needed in fighting a fire in the building. It would enable the salvage corps to do quick and intelligent work, and would enable the fire fighters to direct their efforts more intelligently, without having to search for the information—a difficult thing to do with a structure full of stifling smoke. The card should be revised whenever there was a change in the position of the stock or fixtures, and in any event should be corrected twice a year. Several copies of the card should be provided, one to be left at some place in the building, one to be sent to the fire department, one to the department of building inspection and one to the factory inspector, in cases of factories. Variations of the plan could be worked out to fit different structures, but the plan has the nucleus of a valuable suggestion.

Menard & Fakstrault, lumber, etc., of Montreal, Que., are stated to have dissolved.

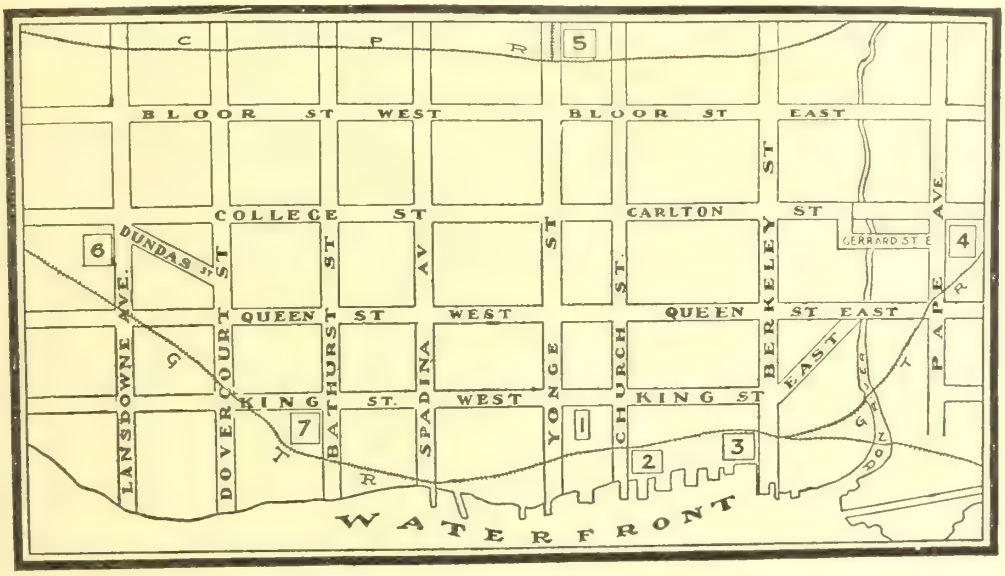
Flowers & St. Leger, Toronto, Ont., sheet metal workers and roofers, are stated to have dissolved.

J. G. Robson, lumber dealer, New Westminster, B.C., is stated to have assigned to S. S. Malcolmson.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

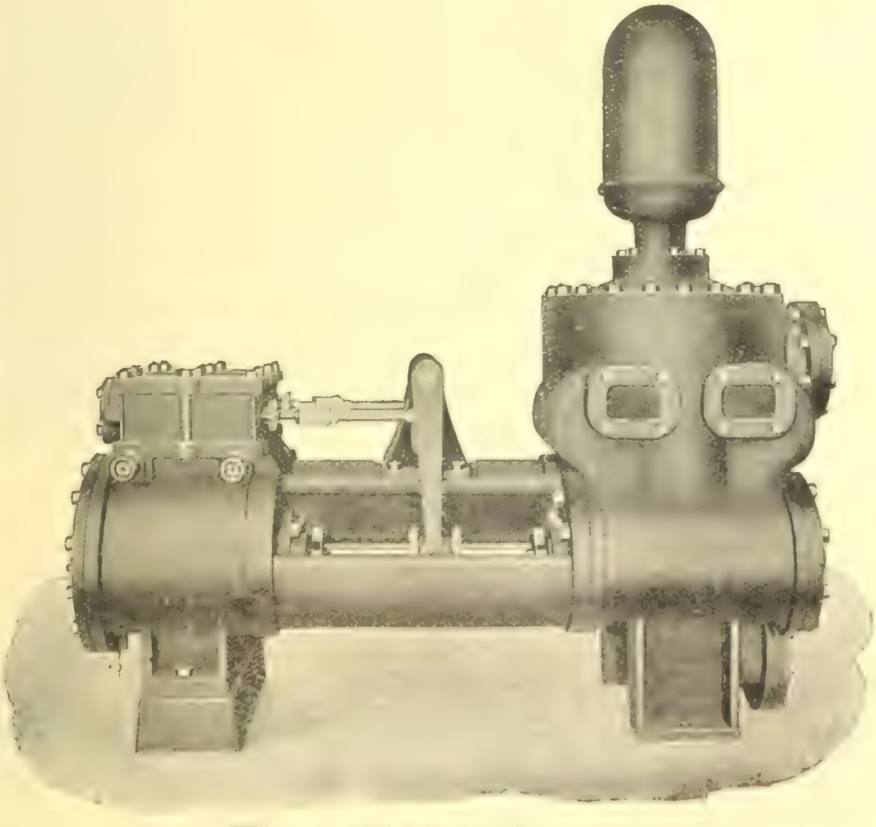
Telephone
Main
4
1
5
5



No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, **Toronto**



The Blake Pump

STEAM PUMPS

FOR

BOILER FEED

AND

GENERAL SERVICE

CARRIED

IN STOCK

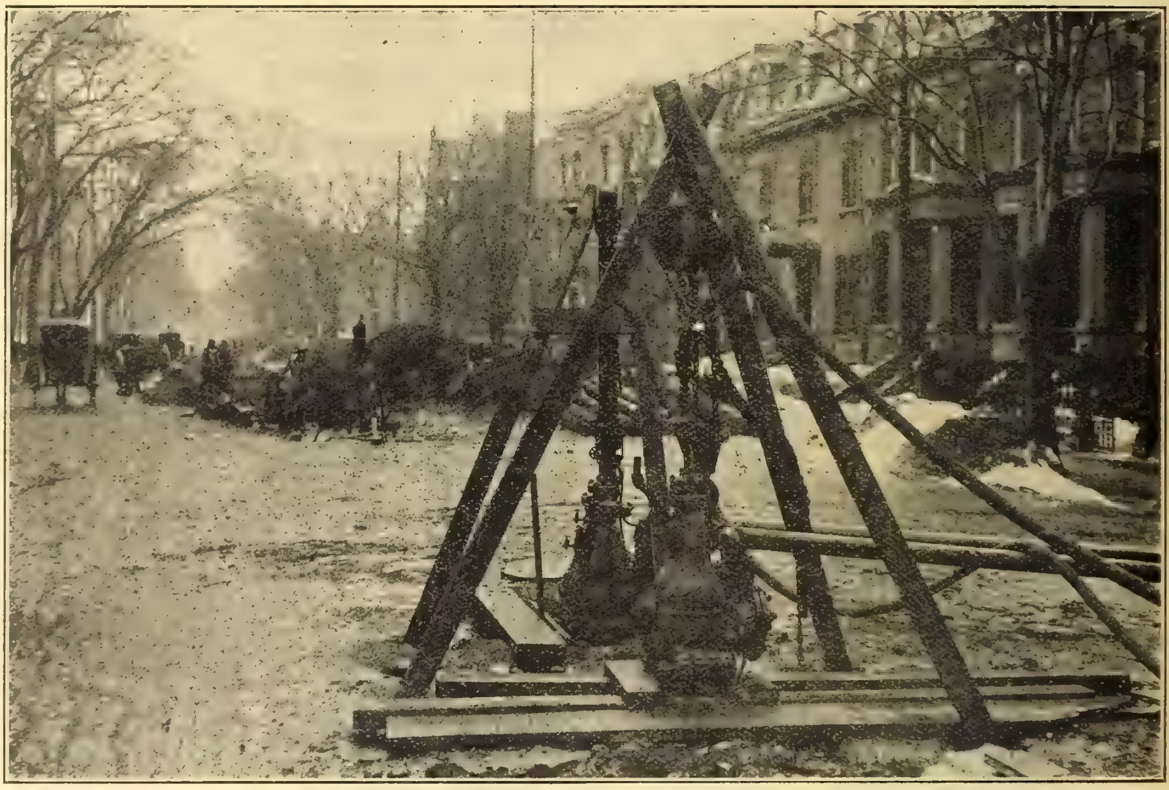
WORKS: MONTREAL

**THE
JOHN McDOUGALL
CALEDONIAN IRON
WORKS COMPANY
LIMITED**

PULSOME

The best for Hard Continuous Service
Pump Dirty Water as well as Clean

Simple - Economical - Reliable



Two Pulsometers on Sewer Contract in Montreal

Write for Catalogue No. 39

Head Offices and Warehouses :

Montreal

MUSSEN

R PUMPS

Pulsometer Working in a Quarry

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's Acid Proof Coatings

These products are attracting unusual attention along the lines of protecting iron and steel construction from corrosion, due to electrolysis, acid and alkaline reactions, the element and other causes. Their heat and acid-resisting properties are superior to anything on the market. By specifying a priming or shop coat of Acid-Proof Coating you insulate the structure by placing a film or cushion of Acid-Proof Coating upon same, which material is an insulating medium of highest non-conduction efficiency. This should be followed with a coat of Graphite Acid-Proof Coating, in this way you avoid the placing of a metallic, magnetic coating, such as lead, zinc, etc., in direct contact with the metallic surface, thus avoiding the possibility of exciting electrolysis, the results of which are self evident.

Furthermore, when a pigment, metallic, magnetic coating is placed in direct contact with the structure, corrosion takes place underneath the surface.

Made in transparent, also in natural graphite color, also jet black, dark olive green and dark red.

Covers 500 square feet and upwards to gallon, according to conditions.

Send for special booklet on Acid-Proof Coating.

Specifications.

First: A priming coat of Glidden's Acid-Proof Coating (transparent), which completely insulates the structure, followed with a coat of Glidden's Graphite Acid-Proof Coating, followed with a finishing coat of Glidden's Acid-Proof Coating. With this specification you place a coat of Graphite between two elastic durable films or cushions of a most powerful insulating medium, namely, Glidden's Acid-Proof Coating, thereby effecting a double insulation against electrolytic action, leakage and its results—corrosion.

By no means place a metallic pigment coating in direct contact with iron and steel surfaces; first insulate the surface with Glidden's Acid-Proof Coating.

The above specification insures results never obtained before from the standpoint of protection of iron and steel surfaces against corrosion.

P.S.—It is understood that all surfaces are to be free from grease, rust and foreign matter before applying the insulating or priming coat of Acid-Proof Coating.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio
Distributed in Canada by
Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

THE NORTHERN ELECTRIC AND MFG. CO. LIMITED
FIRE-ALARMS TELEPHONES SUPPLIES

Inter-phones

No. 2016—Type-Metal Inter-phone for desk use

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER Tel. 2010 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto September 7, 1910 No. 36

Legal and General Relationships between Architect and Contractor

The paper by Mr. Isaac Campbell, K.C., a synopsis of which appears in this issue, may be read to advantage by all connected with the building trade in Canada. While Mr. Campbell addresses his remarks to the architectural profession, the principles involved and the advice contained therein are just as fundamentally important to the contractor. Indeed, in our extract work we bore this matter carefully in mind with a view to directing attention particularly to those points which are of common interest.

Mr. Campbell makes some interesting observations regarding the relation of the architect to the owner and the contractor. "It is a maxim of high and immemorial authority," he writes, "that no man can serve two masters." In his relation to the contractor he has to bear in mind always that he is serving primarily the interests of his employer. These are to produce the desired results at a minimum of cost and time. Emphasis is laid upon the unfairness to the contractor of the architect's having a personal or pecuniary interest in the work without his (the contractor's) knowledge, and it is of interest to note that the contractor is legally entitled to be apprised of such interest. It is not difficult to understand the necessity for this when it is considere dthat it is not an uncommon thing for a contractor to agree to leave decisions solely with the architect. It would be manifestly unfair for him to do this if the architect had other than a working or professional interest in the work. The manner in which the consequences of omitting to furnish the contractor with all such information may re-act upon the architect are set forth in the cases of Kimberley vs. Dick, and Ludlam vs. Wilson, particulars of which are given.

The need for the contractor's familiarizing himself very closely with every detail of the contract is well illustrated in the section relating to defective plans. It is a too common occurrence for contractors to be over anxious for a certain job and submit an estimate before they have mastered the details of the work or even the wording of the contract. The first question that arises in a court of law in disputes of this kind is, What is the contract? The principle is well brought out in the case cited.

Inconsistency may sometimes be detected between the copies of the plans and specifications furnished contractors. This point is covered in Mr. Campbell's paper as are also several miscellaneous points of interest to the architectural profession. Doubtless there will be those whose success in keeping out of the law courts will lead them to pass over this article. Apart altogether from its legal aspects, however, it has a real value in establishing the closeness of the relationships between architects, engineers and contractors and in emphasizing the need for understanding the letter of the contract.

Should Contractors Pay for Mistakes in Estimating?

The idea of robbing Peter to pay Paul is exemplified in a recent dispute at Ottawa, where it was proposed by an alderman to release the successful tenderer for a new fire station on the ground that he was a "citizen and a taxpayer." The contractor in question had made a mistake in computing his estimate and wanted to withdraw when he made the discovery that he had been "successful." He urged without avail that he had made a mistake in figuring.

Now the only object in calling for tenders on any contract is to secure the lowest price compatible with the specifications which are furnished all intending bidders. The deposit demanded in all cases is to prevent any lapse on the part of the successful tenderer. To allow any withdrawal as soon as the figures are published would be to make a farce of civic contract work and inevitably result in a loss of money to the city. The average contractor would soon cease to tender on civic specifications, and eventually the corporation would be compelled to pay whatever estimate was furnished it by any contractor who cared to take up the work offered.

The "successful" bidders in such cases as these have our sympathy, but we cannot think that they should be relieved of their obligations except in very rare instances. We hold no brief for the municipality. We say this in the interest of contractors as a whole. It is hard to have to pay hard cash for one's mistakes, but after all it is only what is experienced in every walk of life.

Progress of Quebec Bridge Construction

Detailed Account of Methods Employed by the Contractors—Plant and Machinery Required for Substructure — An Interesting Comparison

Prepared expressly for this Journal by our Montreal Representative

The north shore site of the new Quebec bridge is at present the scene of great activity. Approaching the site of operations from the St. Louis road, which leads from Quebec City, the railway yards are encountered. Here the contractors, Messrs. M. P. & J. T. Davis, have a large staff of workmen employed in laying extensive tracks and sidings for service in handling and storing supplies when the work of constructing the bridge proper begins. Further on another gang of men are engaged in widening the approach to the bridge, for the centre of the new structure has been shifted slightly to the west.

The old structure after the disaster

From the crest of the hill a general view of the works is obtained. Across the river lies the wreckage of the former bridge, a grim reminder of the disaster of 1907. This debris can be seen exceptionally well at low tide.

The Big Caisson—Interest centres around the work of Messrs. M. P. & J. T. Davis, who have contracted to construct the substructure for the new bridge. Their present work consists of sinking into place the enormous caisson which is to form the footing for the north main pier. The amount of plant that must necessarily be placed in position, the enormous work involved before the actual work of sinking the caisson can be commenced, are features that cannot fail to impress the onlooker.

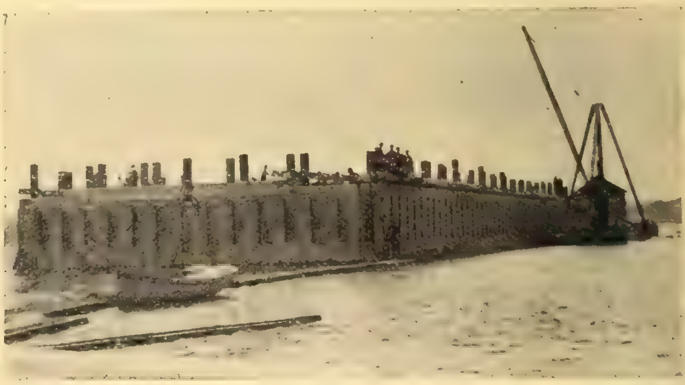
The big caisson was built at Sillery, a small village about two miles to the west and on the same shore. Here again it was necessary to make elaborate preparations for construction and launching. Work was first commenced early in April of the present year and a large shed, approximately 200 feet by 70 feet, was erected to ensure steady progress, regardless of weather conditions. For a short period the contractors were delayed pending alterations to the plans, but on July 8th work was well advanced and the launching from the ways was successfully accomplished. To aid in this latter work, concrete piers had been constructed to better control the movement of the caisson until it reached the water.

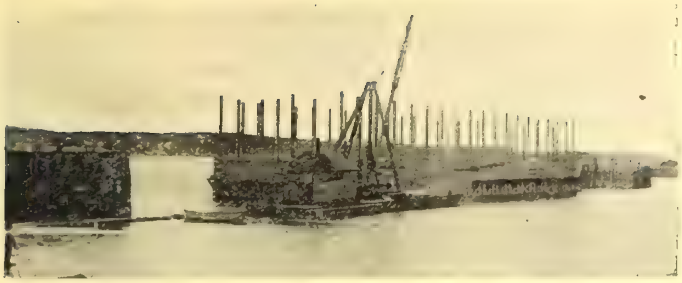
On August 1st the caisson was towed out and placed in position. Taking advantage of the period between tides, the caisson was floated in between two rows of piles, with a small clearance of two feet at each end. A staging was afterwards erected, closing off the entrance-way. Both up and down stream the caisson is securely anchored by cables attached to heavy oak beams weighted in position by rocks. The number of cables will be augmented as the caisson goes down and the pressure increases. When launched the big structure drew only five and a half feet of water, the floor having been false-bottomed to give this effect.

The site of the new north caisson is five feet south of the existing caisson and is to be sunk to an elevation four feet, or much lower than the old one. The centre line of the new north main pier will be 57 feet off shore from the centre line of the old pier and will be also 15 feet west of the centre of the old north pier, to accommodate the shift of the new south pier. The anchor pier and abutment will also shift the same distance to the west, but details of these have not yet been settled.

Caisson Construction—The caisson for the north main pier embodies several unique features in caisson work. In giving this important work to Messrs. Davis, the Board of Engineers left the design to the contractors, stipulating only that it should be most modern in every respect and that the final plans should be subject to the Board's approval. Caisson work is not new to

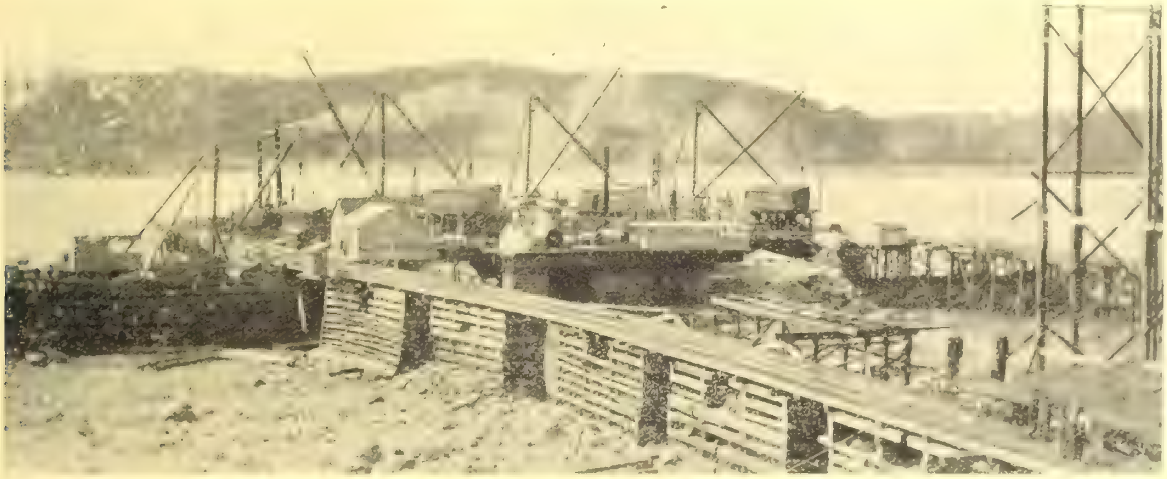
General view of M. P. & J. T. Davis' plant at Sillery.


The big caisson just after being launched at Sillery



Big caisson at Sillery ready to be towed out into position

Messrs. Davis, and it may be said that in planning this structure the experience of years was available. The dimensions of the caisson on the cutting edge will be 180 feet 6 inches by 55 feet 6 inches. In the main wall construction, 12 feet by 12 feet, Georgia pine timber is being employed, while for the cutting edge, 30 feet by 30 feet, British Columbia fir has been adopted. The wall seams are being well caulked with oakum, pitch and tar to render them water tight. The heavy square timber forming the walls will be kept in place by thickly interspersed drift bolts. In order to minimize friction in sinking caisson the walls will be cased with two layers of 3-inch tongued and grooved sheeting, laid vertically.



View of contractors' plant from east of elevator

The working chamber, which is both air and water tight, is divided by eight bulkheads and has a comfortable working height of eight feet. The roof or deck of the working chamber consists of two rows of 12-inch by 12-inch pine timber, separated by two layers of 3-inch tongued and grooved planking. The whole is well supported and knee braces are placed at frequent intervals.

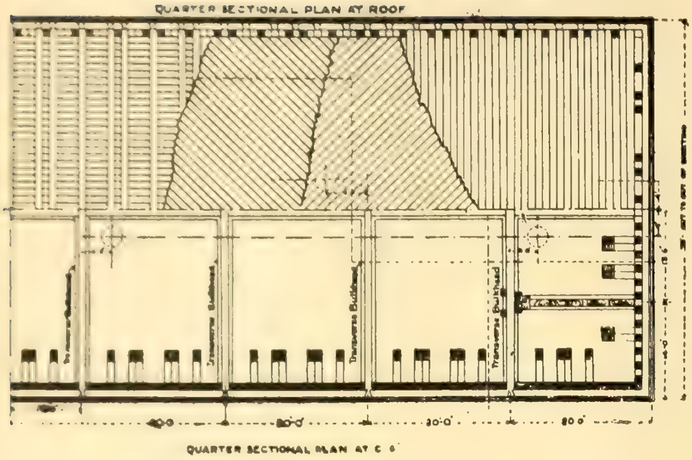
For the cutting edge the usual steel shoe has been discarded and is in this construction replaced by a wearing timber consisting of a solid piece of oak, 12-inch by 6-inch and which is easily replaceable. It is estimated by the contractors that this arrangement will be more serviceable, since the usual steel shoe, once it becomes twisted or broken, is no longer useful and cannot be replaced, whereas the wooden timber can be renewed without difficulty, as required.

By a remarkable coincidence the seven-ton girders which were to have formed, in the old bridge, the floor beams for the railway section of the bridge, were found to be of just sufficient length (55 feet) to be of service in supporting the walls of the caisson.

The first row of 17 girders has already been placed in position about 15 feet above the deck of the caisson. By this arrangement the weight will be carried directly to the cutting edge instead of falling on the roof. The additional strength gained by the use of the steel girders will enable the contractors to load the caisson as desired, where in ordinary caisson practice it is customary to equalize the hydraulic pressure and the load. In this instance the girders were close at hand, but in any event the steel construction would probably have proved a profitable venture. It is often found necessary in sinking caissons to keep the concrete to quite a depth below the water in order to prevent the caisson becoming too heavy. The effect of the girders in withstanding the heavy hydrostatic head would be invaluable in this instance.

The total weight of the caisson is estimated at about 1,700 tons. Approximately 70 tons of bolts, 50,000 barrels of cement and 3,000,000 feet of timber will be required for its construction. The method of excavating material for the working chamber will be along the usual lines employed in caisson work. The contractors, to facilitate operations, employed a dipper dredge on the site of the caisson, and dredged the bed to a considerable depth. When the cutting edge reaches the river bed the lighter material will be blown out, all the chambers being piped This operation consists of simply allowing the compressed air in the chamber to escape, carrying with it the material, which has been shoved up against the valve. Jets of steam can also be blown into the chamber under high pressure to loosen the sand and gravel. Sinking pumps will be employed to remove

General view of construction work showing steam dredge in operation. (Inset shows where larger view was taken and also sheds containing boilers, air compressors, etc.)



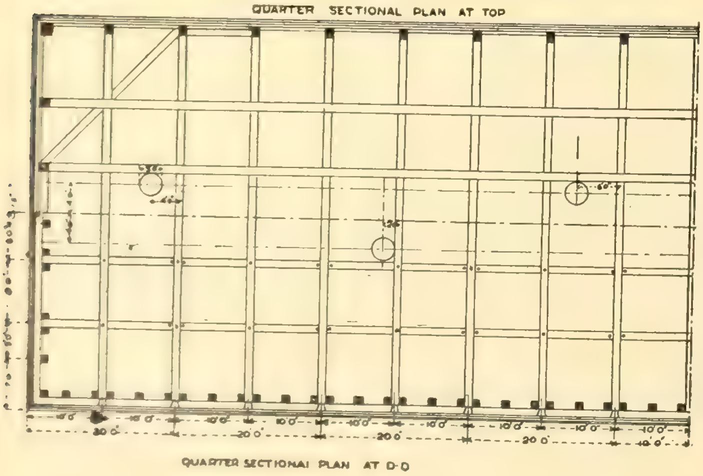
Showing the deck or roof construction of caisson. Note extensive knee bracing

some of the material while the heavier excavations will be taken out by buckets through air locks. This latter operation takes place as follows: The bucket is lowered by the derrick into the lock, the upper door closing against the cable. After the lock has been filled with air the bottom door is allowed to drop open of its own weight. The bucket is then lowered and filled with material and hoisted into the lock again. Then the lower door is swung up by levers from the outside and the air in lock allowed to escape, permitting the top doors to be opened.

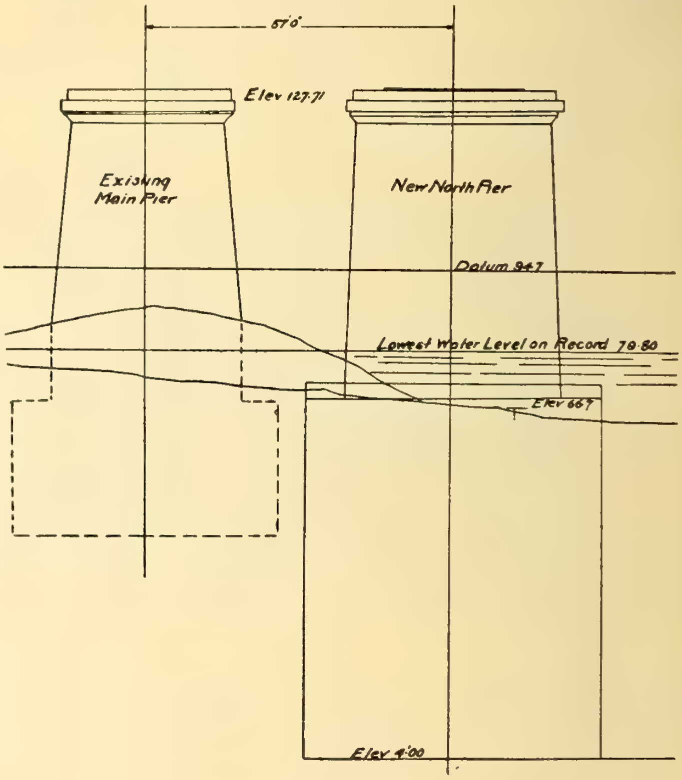
Messrs. Davis have now on hand a large staff of "sand-hogs," by which title the excavators are known. At the lower depths these men will be working at a pressure of about 48 pounds. Two 40-minute shifts in the 24 hours complete a day's work at these depths, for which the men receive liberal pay.

The work of concreting the cofferdam has now been placed under way and from this time on the contractors figure that rapid progress will be made in sinking the caisson. Once the river bed is reached the pneumatic work will be started and the caisson is expected to go down at the rate of one foot to eighteen inches per day. Work will be carried on continually, night and day, until the big structure is sunk to the required depth of approximately 70 feet.

Plant—The machinery and plant required by Messrs. Davis in carrying out their substructure contract is extensive. At the foot of the hill is located the power and boiler house. Here are situated the four large Ingersoll-Seargent air compressors with a capacity of 2,240 feet per minute, under 100 pounds pressure. These compressors are driven by a battery of six 125 h.p. boilers, supplied by the John MacDougall Caledonian Iron Works Company, Limited. This air is chiefly for service in the pneumatic caisson work and is carried out to the staging through a 12-inch pipe and fed into the caisson as required. This compressed air pipe is surrounded by a water jacket in order to cool the air and thus render the work of the men more comfortable.

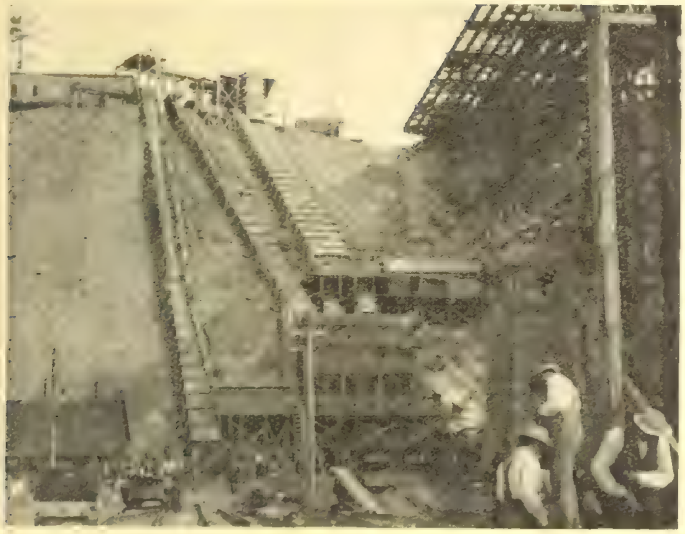


Showing the lay out of square timbers forming roof of caisson

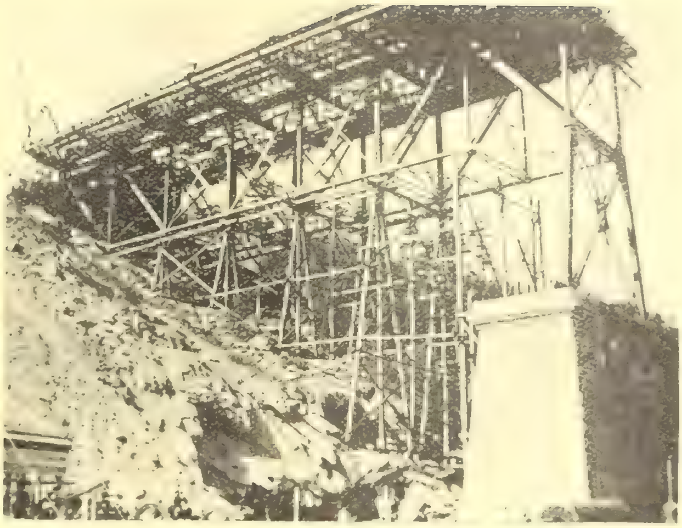


New North Main Pier

On the top of the hill, a trestle work has been erected. This will enable the dump cars to empty their loads of gravel and rocks into the chutes which have been prepared to receive them. From the hill, the materials to form the concrete are led below by a natural gravity system. The rock passes through to the rock crushers, two in number, supplied by Allis-Chalmers-Bullock, Limited, which are separately steam driven, and from there is fed to the two concrete mixers. The rock bin, it may be mentioned, has a storage capacity sufficient for a 24-hour run, thus minimizing danger of cessation of work. Gravel and concrete are also delivered to the mixers through chutes at the top of the hill and from the mixers a railway carries the concrete to the side of the caisson. The anchor pier of the old bridge, a splendid piece of masonry, is being pulled down by the contractors and the granite obtained from this source will be used in the cofferdam construction. Six derricks, three on the north and three on the south staging, placed so that they will operate equally well at either high or low tide, have been installed to hoist the various materials as required. Messrs. Davis have also installed an electric lighting plant and the whole works will shortly be illuminated by numerous arc lamps. Since the work is to be carried on night and day without ceasing, the necessity for the lighting plant will be appreciated. For the accommodation of the engineers a commodious boarding house has been erected at the foot of the hill, and close to the work. Here the wants of



View of concrete plant from trestle

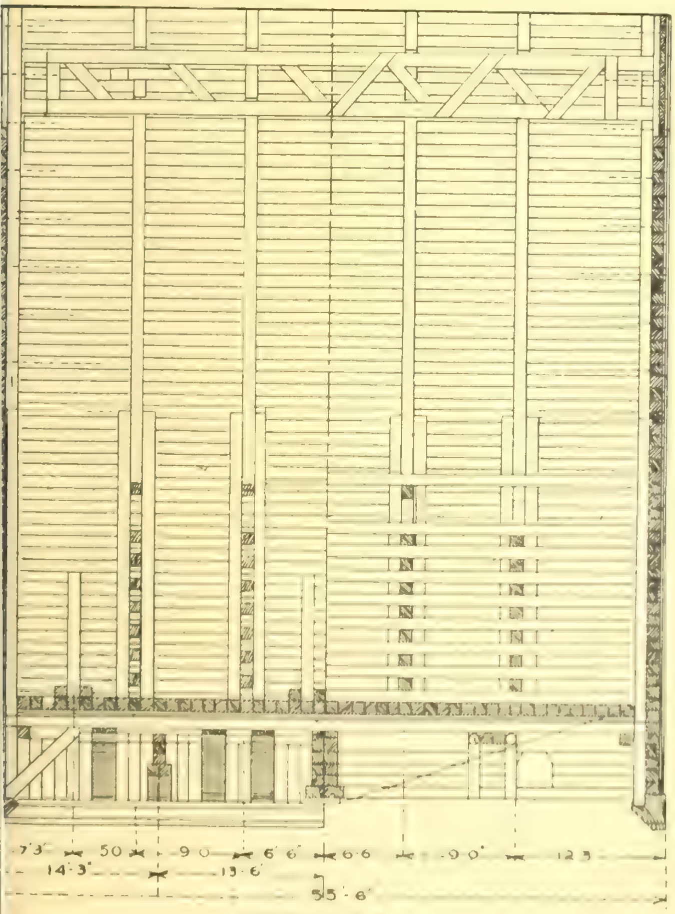


Extent of construction of old bridge on north shore. All the steel will be removed and the granite forming anchor pier will be used in construction of new caisson

the men are considerately looked after while the cuisine provided is of the best.

Mr. M. P. Davis personally takes an active interest in the work of superintending construction with Mr. C. A. D'Abbedie, Mem. Can. Soc. C. E., who is the engineer in charge. Mr. Wm. J. Galbraith is also actively connected with the caisson construction.

Office of Quebec Bridge Commission—The Board of Engineers have erected at the crest of the hill a combined office and rooming building where the Government's staff of engineers are established. Mr. J. D. Wilkins, the resident engineer for the commission, is a man of considerable experience in general engineering practice. Previous to his present position he was commissioner in charge of construction on the famous Queensborough (Blackwell's Island) Bridge. He was also connected with the erection of the Williamsburg Bridge and for a number of years was identified with the engineering interests of the New York Central Railway lines. At the present time Mr. Wilkin's department is engaged in testing the concrete to be used in construction of the large caisson and in generally supervising the progress of the work on behalf of the Bridge Commissioners. Attached to this office also are Messrs. Atkinson and H. E. Bates.



Side elevation of caisson with sheeting removed

Koenig & Company's Operations—The work of removing the debris of the Quebec bridge has been carried on continually for several months by Messrs. Koenig & Company, of Quebec, and a big pile of wreckage has been taken out and piled on the shore. During the spring two bodies of victims were recovered. In the early operations an oxy-acetylene flame under heavy pressure was used to advantage in cutting up the twisted debris. Latterly the contractors have resorted with considerable success to dynamite to assist them in their work. Heavy charges of dynamite have sometimes to be used. For instance, it required a charge containing 50 pounds to blow the big shoe plate from the anchor pier. The work of dynamiting is not carried on without danger, but a bomb-proof shelter, consisting of heavy timbers, has been provided for the workmen. In some instances fairly large pieces of steel, blown across the river to the north shore, have been picked up by the contractors at work on the caisson. In the operation the sticks of dynamite are simply laid against the wreckage. Good results have been achieved by this method of procedure.

Phoenix Bridge Company's Contracts—The Phoenix Bridge Company, the contractors for the construction of the old bridge, are at present employed on the north shore removing their falsework which had been erected to a considerable distance past the completed approach span. They have about fifty men employed and with the assistance of three derricks are making excellent progress. As fast as the false work is taken down it is loaded on cars and shipped back to the company's plant at Phoenixville, Pa. The company also have the contract for taking down the intact approach spans on both sides of the river.

A Comparison With the Famous Forth Bridge—A

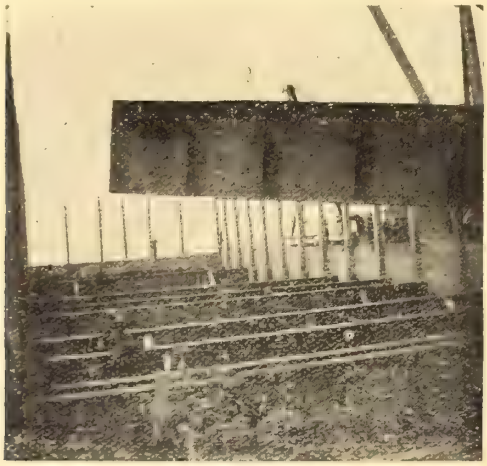
Caisson ready to launch at high tide

general statement in reference to the new Quebec bridge has been made by Hon. G. P. Graham, Minister of Railways and Canals. A comparison is made throughout with the famous bridge across the Forth:

	Quebec Bridge.	Forth Bridge.
Total length of cantilevers ....feet	2,930	5.349.5
Number of channel spans	1	2
Length of longest channel span..feet	1,758	1,710
Load per lineal foot bridge is designed to carry exclusive of its own Weight ....pounds	13,340	4,480
Total weight of bridge ....tons	72,000	57,000
Weight per lineal foot for cantilever only .... pounds	49,150	21,360
Greatest depth of piers below high water .... feet	93	87

Roadways on Quebec bridge: 2 railway tracks, 2 street railway tracks, 2 highways, 2 sidewalks; on Forth Bridge: 2 railway tracks.

The weight per lineal foot of steel in the Quebec bridge is 2.30 times as great as that of the Forth bridge.



Swinging a girder into position. This construction enables the contractors to load the caisson up to any point required

The load for which the Quebec bridge is designed is 2.98 times as great as that for which the Forth bridge was designed.

The Forth bridge has 4.77 pounds of carbon steel for every pound of live load it is designed to carry.

The Quebec bridge has 3.69 pounds of nickel steel for every pound of live load it is designed to carry.

The prescribed test load for the Quebec bridge is 4⅓ times heavier than that used for the Forth bridge.

Test pieces of the compression chord of the old Quebec bridge broke at 26,850 pounds per square inch.

Test pieces of similar chords for the new bridge broke at 56,800 pounds per square inch.

The new chords are therefore more than twice as strong per square inch as the old ones.

The maximum section of the compression chords of the old bridge was 843 square inches; in the new bridge the maximum section is 2,037 square inches.

According to the tests the old chords would break under a pressure of 22,634,000 pounds, and the new ones under a pressure of 115,701,000 pounds.

The new chords are therefore more than five times as strong as the old ones, although the live load of the new bridge is only about twice as heavy as the live load of the old bridge.

Problem of Steel Bridge Corrosion

Encasing Steel Arch Ribs in concrete, as used in the Buffalo grade crossing improvement, illustrates one phase of the effort to solve the problem of steel bridge corrosion, says the Engineering Record. The plate girder arches, under construction by the Buffalo Grade Crossing Commission to carry railroad tracks over highways, possess the additional merit of satisfactorily meeting two other requirements which are often overlooked in grade crossing eliminations. In the first place the arch presents by far the most pleasing appearance of any bridge type that could be used in such a location. It should be borne in mind, however, that to secure the best architectural treatment the clearance under the structure should not be too small. Frequently, in fixing the clear headroom underneath the bridge, the minimum is used without giving proper consideration to the effect which this will have on the finished structure. It is, of course, realized that this matter is intimately connected with the question of cost, but in many locations appearance is of prime importance. The second desirable feature which should be possessed by an overhead bridge in a thickly settled community is freedom from resonance due to passing trains. Ballasted floors have solved this problem, but where the ballast is carried on steel construction, as on a trough or flat plate floor, there is the uncertainty of corrosion of steel parts, even though direct contact between ballast and steel is prevented. With a ballasted floor on a concrete deck, and with all metal parts completely covered with concrete, the steel arches should be practically immune from ordinary corrosive influences. A difficulty that is likely to be experienced in the maintenance of such structures, however, is the cracking of the concrete where it is used as a thin veneer on large steel surfaces. The introduction of wire fabric no doubt minimizes this action; nevertheless, care should be taken not to use the veneer too thin, and to have the fabric thoroughly connected to the steel frame.

The Earthwork on the Belle Fourche Dam, South Dakota, is practically completed. This is one of the largest earth embankments in the world, having a length of 6,200 feet and a maximum height of 115 feet. It contains about 1,674,000 cubic yards of earth, and the inside face, which has a slope of 2 to 1, is protected from wind and wave action by 2 feet of screened gravel, on which are placed 4 x 6-ft. concrete blocks 8 inches thick. This structure closes the outlet to a natural basin, and an inlet canal 6½ miles long and 40 feet wide on the bottom carries the waters of the Belle Fourche River into the reservoir thus formed. When the distribution system is all completed, 600 miles of canals and laterals will carry the waters over 100,000 acres of land.

Modern Bituminous Road Construction

Results of Experimental Work of Interest to Engineers and Municipalities—Grouting and Mixing—Material and Labor—Cost Data

As is well known, there are two distinct methods of bituminous construction: grouting and mixing. The general process used in grouting is described as follows by H. C. Poore, in "Good Roads," in an account of the bituminous experimental work of the Massachusetts Highway Commission:

Upon a re-shaped old macadam surface or a four-inch foundation course of new macadam, a two-inch course of No. 2 stone is laid, omitting the customary flushing coat of screenings. This course is well rolled and kept free from foreign materials such as dust and leaves. Upon this prepared smooth surface is poured the hot bitumen of various kinds; about two gallons per square yard for two inches of stone is the usual amount. This bitumen must be distributed evenly and many machines are now on the market to accomplish this. In my opinion the most satisfactory one is a detachable distributor, which has been largely used, and been found very satisfactory. The two gallons of bitumen will usually sink out of sight, as it is too small a quantity to flush up over the top of the stone. Upon this bitumen grouted course one of two things may be done, either an additional painting coat of .5 gallon per square yard may be spread or else the voids may be filled immediately with pea stone or fine sharp gravel. Experience shows that a painting or sealing coat should always be spread immediately upon the application of the bitumen, and rolled as soon as possible in order to press the grit into the bitumen before it becomes set. This final surface should be protected from travel for 48 hours when oil is used and 24 hours when tar is used.

The method of heating the bitumen is important as the cost of heating is a large item, considered in reference to the cost of the bitumen. When an auxiliary spreader is used, tank wagons, heated with steam coils, are economical. The bitumen should be delivered in tank cars at the railroad siding and heated as hot as possible by steam coils in the tank cars. The material is pumped into the tank wagons by a steam or hand pump, or better, when possible, flows by gravity. The coil in the wagon allows the material to be re-heated from the steam roller at work on the road if it is found necessary.

Mechanical Mixing

For a two-inch surface a saving of .5 a gallon of bitumen per square yard can be made by using the mixing method in place of the grouting method. It is safe to say that a grouted road is usually not as satisfactory and long lived as a mixed road. A thorough consideration of the saving in cost of construction compared with annual repairs and the length of life of the road must be made to determine which method is most economical. The following method of hand mixing has been found of low cost and very satisfactory. Upon a mixing board, preferably iron, one-third of a cubic yard of No. 2 stone is dumped in a conical pile, over which is poured the proper quantity of bitumen. During summer weather six men working in pairs will thoroughly coat this stone in fifteen minutes. Each pair turns the stone once. This is true of such materials as asphaltic oil with oil asphalt 2 to 1 and as tarvia X. When the last pair of men finish turning the stone all six men place the stone upon the foundation; the mixing board is kept about three feet ahead of the finished surface. This method needs only to be tried to see its advantages. Three two-wheeled 100-gallon kettles will be sufficient to keep a supply of hot bitumen sufficient for two such mixing gangs working side by side on a 15-foot roadway. A ten-ton roller can be used on such a surface one hour after laying, and it is best to thoroughly roll all the surface spread before leaving for the day. Hence the roller must necessarily work for some time after the mixing work is completed for the day. After the surface has been brought to the proper cross section and all depressions refilled a very satisfactory painting coat of bitumen is applied by the bucket and broom method. From my experience it is best to paint the road at once after rolling. Other engineers, however, have had good results by allowing the surface to stand before painting.

Mechanical Painting

From my experience, corroborated by others, hand mixing apparently costs four times the cost of mechanical mixing. Very little mechanical mixing, however, has been done in this state in building bituminous macadam. One mechanically mixed oil and stone surface has proved satisfactory and economical. Further than this, we can only judge from the work done on other forms of bituminous pavements.

Concrete mixers for cement concrete are constructed on two lines; the batch method and the continuous method. Both methods are used when mixing bituminous pavements, but as the desirability of accurate proportions in a bituminous macadam is great, the batch mixer will probably prove most satisfactory. Mechanical mixing over hand mixing is desirable because of the rapidity with which the work may be done, the correct proportions in which the materials may be mixed and the very thorough manner in which the ingredients are incorporated together.

Maintenance

A two-inch bituminous surface may most economically be maintained by an additional painting coat during the second, third, or fourth year. Depressions and brittle spots should be removed, cleaned out and refilled with identically the same material used in the original construction. When care is taken a depression may be patched and continue to give service as long as the original surrounding surface. The usual method of tar macadam maintenance is similar to that of asphalt paving maintenance. Disintegrated material is removed, the depressions cleaned out, the cleaned surface smeared with hot bitumen and then refilled with materials similar to the surrounding matrix. When an oil macadam begins to ravel it is difficult to patch or renew by grouting the surface because of the partial lubricating property of asphaltic oil.

Oil Sand Mixtures

Asphaltic oil mixed with gravel by various methods is a newly found form of surfacing. A gravel bank containing approximately 50 per cent. of half-inch pebbles and 50 per cent. less than one-half inch will, when mixed with asphaltic oil and spread to a depth of two inches give very good results. A great many experiments with different materials, quantities and qualities, different methods of mixing and rolling, have been tried and it is found that a two-inch surface of this kind upon a proper foundation is perfect in condition after one year of life. From appearances this surface will be in good condition for three years and at its cost is the most economical surface constructed anywhere in the State. Mixing oil and sand together at random will not give this perfect result, but good results can only be obtained when care is exercised in regard to quantity, sizes of materials and quality of bitumen. Something the same result may be obtained by laying a film of oil upon an old road surface, covering with gravel of proper size, and mixing the two together by some mechanical contrivance, such as a roller, tamper or harrow, and repeating the operation.

The following ten tables give the cost of constructing actual roadways, all within 40 miles of Boston.

Tables 1 to 4 include grouting with both one and two applications. The amount of bitumen in table is the total quantity per square yard.

Tables 5 to 8 include various materials hand mixed with the stone. A sealing coat of oil asphalt was usually applied with pail and broom.

Table 9 is the cost of an oiled sand surface on an old reshaped macadam road. About 250 square yards a day were required to keep the cost at this reasonable figure.

Table 10 is the only large mechanical mixed surface undertaken by the commission to date. A trough mixer was used and proved satisfactory.

All the surfaces for which costs are given are approximately two inches thick after rolling on roadways less than 20 feet in width.

Grouting

	Cost 10,800 sq. yds. area
(1)—Tarvia X—	
Bitumen, 2.14 gal. per square yard	.161
Stone, .111 tons per square yard	.134
Pea stone, .029 tons per square yard	.037
Labor and incidentals	.176
Total cost square yard	$0.508

(2)—Tarvia X—	
Bitumen, 1.38 gal. per square yard	.204
Stone, .11 tons per square yard	.138
Labor	.178
Total cost square yard	$0.520

(3)—Tarite—	
Bitumen, 1.25 gal. square yard	.184
Stone, .11 tons per square yard	.138
Labor	.178
Total cost square yard	$0.500

(4)—Heavy asphalt oil mixtures—	
Bitumen, 1.83 gal. per square yard	.284
Stone, .11 tons per square yard	.138
Labor	.178
Total cost square yard	$0.600

Hand Mixing

(5)—Tarvia coated stone, painted with asphaltic oil.	2,000 sq. yds. area	
Bitumen, 1.55 gal. per sq. yd.; 19.3 gal. per cubic yard of stone	.125	
Stone, .11 tons per square yard	.136	
Fuel and incidentals	.045	
Labor	.333	.639
Sealing coat—		
Bitumen, .55 gal. per square yard	.045	
Pea stone top, .019 ton per square yard	.025	
Labor	.011	.081
Total cost per square yard		$0.720

(6)—Tarvia A with pitch—	2,000 sq. yds. area	
Bitumen, 1.12 gal. per square yard; 14.3 gal. cubic yard of stone	.081	
Stone, .101 ton per square yard	.111	
Labor	.139	.331
Sealing coat—		
Bitumen, .62 gal. per square yard	.054	
Sand for top, .0012 cubic yd. per sq. yd.	.002	
Labor	.016	.072
Total cost per square yard		$0.403

(Freight depot within 200 feet of work.)

(7)—Genasco—	4,800 sq. yds. area	
Bitumen, 1.4 gal, per square yard	.182	
Stone, .045 tons per square yard	.109	
Labor	.181	
Heating and rolling	.035	.507
Sealing coat—		
Bitumen, .64 gal. per square yard	.083	
Pea stone top, .012 ton per square yard	.014	
Labor	.052	.149
Total cost per square yard		$0.656

(8)—Tarvia mixed stone, painted with asphaltic oil—	2,500 sq. yds. area	
Bitumen, 1.61 gal. per square yard	.145	
Stone, .095 ton square yard	.109	
Labor	.181	
Heating and rolling	.035	.470
Sealing coat—		
Bitumen, .77 gal. per square yard	.060	
Pea stone top, .012 ton per square yard	.014	
Labor	.052	.128
Total cost per square yard		$0.598

(9)—Oiled sand, hand mixed—	
Bitumen, 1.39 gal. per square yard	.0808
Sand, .077 cubic yards at $0.10 per yard	.0077
Fuel, heating sand and bitumen	.0320
Labor, including reshaping old macadam surface	.2602
Total cost square yard	$0.3807

Machine Mixed

(10)—Genasco—	6,000 sq. yds. area	
Bitumen, 1.25 gal, per square yard	.163	
Stone, .101 ton per square yard	.126	
Labor	.139	
Rolling	.019	
Supplies, including machine	.070	.517
Sealing coat—		
Bitumen, .55 gal. per square yard	.0615	
Pea stone top, .0125 per ton per sq. yd.	.016	
Labor	.0115	
Fuel	.006	.095
Total cost per square yard		$0.612

Notes on Architectural Jurisprudence

Architect's Relation to Owner and Contractor — His Powers as an Arbitrator—Importance of Detailed Plans and Intelligible Specifications*

By Isaac Campbell, K.C., Winnipeg.

There is a remarkable paucity of reported law cases in which the architect is directly a party. The contests between owners and contractors are numerous. Rarely does the architect appear except as a witness or as one whose previous exercise or non-exercise of authority is relied upon by any contestant. Let us assume that the absence from the index of the law reports of the heading "architect" is due to the superior qualities of the men who have chosen the profession. I remember the late Dr. Kelly of Brantford, an eminent educational authority, used to maintain that amongst the best means of educating conscience and to secure ethical strength in the character of youth was the careful teaching of mathematics. Some proficiency in the handling of arithmetical figures, mere dollars and cents, might enhance the skill of a future scoundrel, but mathematics, even if somewhat elementary, relating to the eternal and accurate relations of form, the diameter to its circumference, its sphere to its segment, and those concepts upon which the various series of progression are based, demanding accuracy of thought and result, apart from any sordid suggestion of gain to the student, must in harmony with truth itself promote honesty; and while supple arithmeticians give the criminal courts and the detectives a good deal of trouble mathematicians never do so.

Architect's Relations to Owner and Contractor

It is a maxim of high and immerial authority that no man can serve two masters. As applied to the architect his position under such a rule makes his profession a most responsible one. He is, to begin with, the agent of his employer. He is required to secure certain results by changing labor and material into a finished structure and in doing this to control the contractors, the artisans and workmen who fashion and finish the fabric. As such agent, if authorized, he can do what the employer can do in adding to or subtracting from the work. Certain implied powers and implied duties arise from this agency. He is created a quasi-judicial officer to decide questions of difficulty and dispute between his employer and the contractor.

The architect receives a reward for his work either as stipulated or in accordance with a generally understood rule or scale of his profession. This reward should be paid him only by his employer. The architect should not have a further personal or pecuniary interest. He ought not to be a part owner of the property or of the building or structure to be erected and completed. If he is such then he or his co-owners must give the fullest information to the contractor or proposing contractor concerning the facts.

If, in any specific case, the architect has entered into an undertaking with the owner as, for instance, to what a building will cost, so that in consequence of such undertaking his judicial discretion may be interfered with, that fact should be known to the contractor. The consequences of omitting to furnish such information may not immediately react upon the architect, but where the injustice is gross or palpable the failure to notify the contractor would relieve him from the binding obligation of a contract which committed to the architect the right of final decision and if the court thought that a contractor had not been properly dealt with it would proceed to ascertain how much he should be paid by the owner or builder. Later on the latter and the architect might have to dispute over the loss between themselves. Let me give you some illustrations of the above principles.

Kimberly vs. Dick, an English case, in 1871.—The architect entered into an undertaking with his employer that a manor house should be erected at a cost not exceeding £15,000, including architect's commission and all expenses, and he engaged the services of a contractor who without being informed of the undertaking and without close verification of a bill of quantities given him by the architect, entered into a contract with the employer for the completion of the work from the architect's plans and under his supervision for £13,700, with power to the architect to order extra work and with a clause providing that all questions arising between the parties should be settled by the award of the architect. On a suit by the contractor, claiming to be entitled to be paid by the owner for all work executed by him beyond what was included in the estimate and for certain extra work, it was held that on the evidence the architect was the agent of the employer, that his undertaking as to cost having been concealed from the contractor the arbitration clause in the contract could not be enforced and the plaintiff was entitled to an account for what was due him for any works executed by him under the architect's direction not included in the contract, and for any works so included in the contract the price for which was therein included, and for any variation made under the architect's direction. In another case, language which scarcely amounted to an undertaking, but which was in the form of a strong assurance, was pronounced sufficient for the same result. An architect should be very careful as to the language he employs in furnishing estimates of cost. Where the written contracts for the work are made for the whole work practical difficulty will not often arise, but even in such cases in view of "changes" and "additions" an architect should exercise care in the representations he makes to his employer, and between the two of them they should let the contractor know of any such undertaking.

The case of Ludlam vs. Wilson in the Province of Ontario brought out in evidence that the owner's superintendent was his uncle, who was greatly indebted to him as a result of certain business dealings. These facts were not known to the contractor for a large amount of building material which went into the house. One judge of the Ontario Court of Appeal held directly that this want of knowledge on the part of the contractor would absolve him from the arbitration clause of the contract. The other judge who gave a reasoned opinion referred to the circumstances as being objectionable but based his decision chiefly upon the fact that, after the work was stopped, the owner had discharged the contractor from its completion. As I read the report, therefore, it is not a new authority on the point I have noted, but it indicates, plainly enough, the duty of parties.

Powers of Arbitration.

The architect's powers as a judge or arbitrator arise from contract or agreement. Without that in case of dispute the courts of law must ascertain the rights of the parties as to compensation or damages. By agreement the architect is almost universally appointed as arbitrator, and those who prepared such contracts endeavor if possible to supplant and the jurisdiction of the courts. The inconveniences from tendency to bias or otherwise that might arise from this are thought to be less than the inconvenience, delay and loss arising from a trial that might not take place for many months after the work was done and after the evidence on the ground was lost, except so far as preserved in the defective memory of fallible witnesses. Better have the matter decided while it is open to inspection than to delay it long after, when the evidence will depend upon memory and the decision has to be given by a man who cannot be so well qualified as a skilled architect or engineer. From this results a warning which should always be given to those interested: "What is the language of your contract? What is the contract? What does it say?" Only to the extent that it alters the common law does it confer new powers.

---

* Extract of paper read at 3rd Annual Convention R.A.I.C., Winnipeg, Aug. 25-27, 1910.

As a matter of good practice I would recommend that where the owner or employer has taken an active part in the oversight of his building, and especially where it is known that, either in the presence of the architect or without it, he has discussed questions with the contractor during the progress of the work, then, in such a case, if there be a dispute, or if a dispute be likely, the architect should bring the two parties before him. Let him thresh out the difference, and let him, as a judge, give his decision. In a good many cases such a course will obviate an appeal to any other tribunal.

There must be no collusion between the architect and his employer to the disadvantage of the contractor. The architect must not be submitted to or be subject to any pressure from his employer as to his decision. To act under the orders of an employer in measuring or certifying work would, if accompanied by evidence which left room for the court to draw an inference of unfairness, have the effect of setting aside the architect's decision. What is fraud in such a case has not received a general definition. Each case must depend upon its own circumstances.

Concerning Defective Plans.

The editors of the American and English Encyclopedia of Law state generally as follows:—"In England it is held that where plans and specifications for the execution of a certain work are prepared for the use of those who tender bids for its execution, the person asking for the bids does not impliedly warrant that the work can be successfully executed according to such plans and specifications. In the United States, however, it seems that there is an implied undertaking on the part of the builder (the owner) that the plans and specifications are sufficient for the successful construction of the work, and where the work is constructed by the contractor according to the plans and specifications there is no agreement upon the part of the contractor that the work, when completed, will be safe and fit for the purposes intended."

In the United States there are now some 47 different judicial jurisdictions, each of which is final in itself, and without appeal in matters not involving constitutional questions, and not involving business or works extending over state limits. So that a general statement as to the law of the American States usually means no more than that a large majority of the courts of the several States have concurred in a decided principle. In most of the cases that have arisen there has been something in the language of the contract which affected the decision. In all such cases the first questions were: "What was the contract? What was its language?" The leading English case for the principle referred to is that of Thorne vs. the Mayor of London, in respect of the Black Friars Bridge across the Thames. An eminent engineer drew plans for the bridge, including caissons, instead of the usual cofferdams. It was found that, above low water, the caissons could not resist the force of the current. This resulted in great delay and loss to the contractor, who sued for damages on the ground that there was a warranty that the works could be executed according to the plans provided. The final court (House of Lords) held "there was no warranty, and that the plaintiff should have elected either to refuse to tender, or should have asked for a warranty if the novel mode of procedure alarmed him."

"What is the Contract?"

Important questions must arise from time to time, which have not been as yet anticipated in the decisions of the courts. Most of them will turn upon the question of what was the contract. The structures to which damage is important enough to lead to litigation are usually provided for by contract. With the increased height and weight of buildings, with the increased loads that warehouses are now required to carry, there is usually provision made, especially in the latter class of cases, from which a warranty is at least implied. Contracts are made from time to time, providing for a cargo or storage load of so many pounds per square foot of floor space. Such a warranty would necessarily extend beyond the final certificate and the time of acceptance of the building. Its nature must be derived from its language, and whatever the contract is it would be enforced. Where, apart from such warranty, a contractor agrees to erect and finish a building, he must erect and finish it. He must fulfil his agreement; and this, I take it, must apply to the cases in the American States. The contractor must at least hand over the building. The contract is there, and must be complied with.

It would be impossible to discuss in a short paper the varying decisions due to variations of language employed in such contracts. Where the contractor is eliminated, and the question of the architect's responsibility to his client comes in question, then the principles of the ordinary law of negligence apply. The contractor may have become bankrupt, leaving a cumbersome ruin on the owner's hands. The architect holds himself forth as a man of professional and superior skill. If natural conditions are unknown to him, he should so report, and let the owner take the risk. In the large cities this question will often be very important. I understand that certain soils vary in their capacity to resist pressure, from 500 pounds per square foot up to as many thousands; further, that it is not merely a question of vertical pressure, but a matter of slipping or of lateral escape that is to be feared, because you tell us that if water could be confined laterally it could be built upon. Therefore, the existence of neighboring heavy buildings will seriously affect the problem. To anticipate exactly what will happen is, therefore, impossible. The architect cannot always know. No matter how he multiplies his margin of safety there may be trouble. He should make the possibility of this clear in any case where there is room for suspicion.

Miscellaneous Points of Interest.

There are a number of points not connected with the personal responsibility of a professional man to his client, and not directly germane to the architect's authority as a semi-judicial officer, which may be of sufficient interest to receive some notice.

Without an agreement, the mere employment of an architect makes him practically only a skilled agent of his client. Such employment would not apply to much more than the supervision and direction of the work to be done. It would not give authority to employ another to do the work.

The architect should be careful not to misrepresent his authority. Where a party holds himself out as an agent for another, with authority to bind him, he is sometimes held to his representation.

Where there is a difference between the contract and the plans and specifications referred to for details of construction, the contract controls.

Where there is an inconsistency between a copy of the plans and specifications furnished to the contractor, upon the faith of which his bid is made, and the contract entered into and the original plans retained by the builder, the former will control, and the builder (owner) cannot take advantage of such inconsistency to the prejudice of the contractor.

Where there is a variance between the plans or drawings and the written specifications, the latter will prevail. This is upon the principle that the drawings are illustrative of the specifications; but I think that the following rule should apply in such a case, namely, that where there is a variance between the terms of the contract, the plans and specifications should all be reconciled in a practical manner, if possible.

If the contract is ambiguous, great and sometimes controlling weight will be given the construction which the parties themselves on previous occasions placed upon it.

Written matter will control printed in a case of repugnancy. It is assumed to have been the result of deliberation.

Technical meanings are to be given to trade terms rather than the ordinary meaning of the separate words.

Apart from agreement conferring the authority, an architect has no implied authority to bind other parties by his construction of the contract.

The amount of damages, general or specific, for delay is nearly always a subject for a certificate of the architect; but he has no implied power and this must be provided for by the contract.

The architect may approve of work so as to make his employer liable, without writing. The contract providing for his approval would be satisfied by evidence of his actual approval. For the purpose of preserving evidence, it is always best to provide that the written certificate be required.

Manitoba Legislation.

In Manitoba there is nothing special to report on the legislation affecting architects. Provision was made by 1910 statute for examinations to be conducted by a board appointed by the Provincial Government. The architects in practice at the date of the statute are, by right of that fact, entitled to register with the board without examination.

Of course, architects are affected by the vast body of municipal legislation empowering municipal councils to provide as to the height and strength of walls, the access of light, provision for sanitary appliances, and the multitude of other details which are common in any municipal act and in any body of municipal by-laws. I understand that there is not much difference in the Canadian provinces between either the empowering legislation given by the various provincial parliaments, or in the subsequent civic legislation enacted by urban councils. The city of Winnipeg not long since enacted a very comprehensive by-law. After a good deal of deliberation the draft was submitted to the architects practising in the city, and their suggestions were invited, and many of them were embodied in the by-law finally enacted. It is desirable that architects should not merely give their individual suggestions, but that, in their corporate capacity, they should be consulted freely as to the general body of civic regulations.

Architects in Manitoba are entitled to the benefit of the Mechanics' Lien Act, but, along with material men, they are postponed to mechanics and workmen for the 15 or 20 per cent. rebate, as the case may be, which an owner has to hold back, up to thirty days' wages. This right comes under the statute, and in reading a statute, as in a contract, the question always is, "What does the statute say?" In the American States the rule is not at all uniform. In Pennsylvania, the architect gets the benefit of the statute if he superintends the work of the building. The one, however, who merely draws the plans is not entitled, nor is a consulting architect. They have done no work on the building. But in Manitoba, "Any person who performs any work or service upon or in respect of, or places or furnishes any materials to be used," etc., "in a building, wharf, etc., is entitled to a lien." So that the statute is clear in favor of the lien in this province. There was a considerable amount of interesting discussion in an Ontario case some years ago, where the language of the statute gave the benefit to "builder or other person," in which the right was found in the affirmative.

The Uniform Contract.

In previous sections of this paper, I have referred to the architect's powers, as usually found in contracts and referred to in the law books. In the city of Winnipeg, what is styled "the uniform contract" has come to be almost invariably adopted. It subjects the architect's final authority to several limitations. Provision is made for arbitration by way of appeal from his decisions in several cases, such as the valuation of work added or omitted, and the amount of expense to an owner who has taken the work out of the contractor's hands, when audited and certified by the architect. The duration of the extension of time to which a contractor in certain contingencies is entitled is also a matter for arbitration, if either party is dissatisfied with the architect's allowance. Loss to contractor by owner's delay in furnishing materials outside of contract to other trades is first fixed and determined by the architect, but is subject to appeal. There is a clause providing that if the work be substantially completed, except in some details, the completion of which, owing to the time of the year, would involve disproportionate delay, the architect shall estimate the actual cost of these, add fifty per centum and issue a final certificate. This clause would seem to have much equitable merit. The owner is made liable for fire or tempest, and is required to insure so as to protect the contractor. Combined with this is a provision giving the owner the right of election as to rebuilding.

Civic Extension.

I had intended to devote the larger part of my paper to a discussion as to future legislation regarding city building, the laying out of streets and parks and providing for separate districts for manufacturing, mercantile and residence purposes. You will all have noticed not long ago that a commission has recently made a report to the government of the city of Berlin, embodying recommendations which anticipate at the end of 40 years a population for that city of 10,000,000. They deal with the railway question and railway terminals with a view of abating railway noise and smoke. I am not sure how they propose as to the manufacturing and other districts, where smoke, noise and offensive odors are inevitable, whether by way of zones from a common centre, or by way of sectors, like the spaces between the spokes of a wheel. They propose to control the right of private property, to interfere to a considerable extent with the views of the individual real estate owner, and they also propose that the administration of their plan shall be committed to a body of skilled men—engineers for the laying out of streets, architects for the buildings, and landscope men for the parks. Probably such a plan would be difficult for general adoption in western communities. Who can anticipate the growth of an urban population? We can see, or think we see, the mistakes made. Could we have obviated them without making worse ones? The right of private ownership, however, should not be an objection. The real estate owner who buys acreage at $100 and sells it in four or five years at $5,000, could not fairly complain of such an administration, reasonably exercised. The rapidly increasing value of his land is due to the community, and in most cases to nothing else. If, then, the good of the community requires a modern and enlightened plan for civic betterment, the community has the right to secure it. Delay in securing information, however, has prevented me entering upon a discussion of this Berlin plan. I understand that the proposals have advanced beyond the stage of a mere outline, though authority has not yet been given [illegible]. In any such matter the assistance of skilled men should be called in, not merely for advice, but they should be vested with authority to make their decisions effective.

Canadian Municipalities' Annual Meeting

Excellent Work of the Union as Revealed Last Week at Toronto—Satisfactory Reports from Affiliated Bodies—Some Important Resolutions

The 10th annual convention of the Union of Canadian Municipalities was held in Toronto, Aug. 31st-Sept. 2nd. After registering on the morning of Wednesday, Aug. 31st, a meeting of the executive was held, after which were appointed the members of the committee on resolutions. The proceedings were conducted under the chairmanship of Mayor Evans, of Winnipeg, President of the Union. An address of welcome was delivered by Mayor Geary, of Toronto, who dealt principally with the matter of obtaining an improved service from the railways.

''In some way or other,'' he said, ''the whole question of the control of freight and passenger business should be taken hold of by the union. It should make an effort to present facts to the proper authorities, so that the railways will be compelled to take care of any legitimate business which may arise.''

Response to this address was made by Alderman Dubeau, of Montreal, in the absence of Mayor Guerin, of that city. Among other interesting points discussed in his annual address, President Evans dealt especially with the marketing of municipal securities. He claimed that London was the best market for the larger Canadian municipalities. The best results were obtained in London by issues of not less than £100,000. Bonds were regarded in London as a preferable form of security. Securities in large volume were more easily sold than small securities.

Reports of an encouraging character were received from the following affiliated Provincial Municipal Unions: Manitoba, British Columbia, Saskatchewan, New Brunswick, Nova Scotia and Quebec.

The work and aims of the Union were detailed in an interesting manner in the report of the honorary secretary, Mr. W. D. Lighthall, K.C. Noteworthy reference is made in this report to the exploitation of Canadian resources for the profit of foreign concerns. In this connection Mr. Lighthall has the following to say:

Are Canada's Resources in Danger?

''We have found specially troublesome certain large combinations. One was the Bell Telephone Company, which, as regards us, is an essentially United States corporation—a form of the American Bell Company, and follows its methods. After years of contestation we obtained our points and it is now quiet. Another, of Canadian origin, and which has proved the most serious and deftly managed organization the municipalities thus far had to fight, is the Mackenzie-Mann combination, which has pulled Ottawa political wires on a large scale against our cities for many years, and has been said to ''own the House.'' Their enterprise is admirable, but some of their methods damnable; perhaps we may expect more agreement with them in the future. But both are now overshadowed by a new combination to which the attention of every Canadian citizen ought to be directed. I refer to the Pierpont Morgan influence, mentioned above. We have it on good authority that this financial organization is so complete that all the principal city franchises, water powers and great resources generally of Canada are mapped out in New York for systematic invasion, on the same lines as those of the United States. Consequently, terminal bills and power and canal bills on a vast scale, scientifically directed, have been appearing on the horizon with powerful New York backing for the past three years, and constitute one of the most formidable questions affecting our national heritage.''

After a resumé of the specific results accomplished by the Union since its organization, Mr. Lighthall concluded by summarizing the principles for which the Union stands.

1. The Canadian people shall not be ruled by any irresponsible monopoly.
2. They shall not submit to methods of fraud or corruption.
3. There must be no perpetual franchises.
4. Our heritage of natural resources affecting municipalities must not be sold, but leased, if not publicly operated.
5. One generation cannot legislate away the rights of another.
6. Municipalities must control their streets (subject to reasonable passage for through lines).
7. Each Canadian shall have a fair deal from all who are granted corporate or other public privileges.
8. Some court or council must always exist free and equipped to enforce the fair deal.
9. The life of the poorest citizen must be made worth living, through his share of the best civic conditions and services.

An eloquent tribute was paid to the efficient service rendered by Mr. G. S. Wilson, of Montreal, the assistant secretary.

Mr. J. W. McCready, of St. John, N.B., in reporting on the work of the Union of New Brunswick, of which he is honorary secretary, took occasion to emphasize the loss entailed by the Campbellton fire, which is estimated at $7,000,000. The Dominion Government has been asked to finance the town debt.

The Hydro-Electric Power Commission.

Mr. W. K. McNaught, M.P.P., addressed the delegates on the subject of the present status of the above body, and paid a tribute to the work done by Hon. Adam Beck and Chief Engineer Sothman in the movement for cheap electric power for the province. He referred to the cost of the system as having originally been estimated at $3,749,000, and said the actual cost would be $149,000 within the estimate.

President Evans, in thanking Mr. McNaught for his address, referred to Winnipeg's municipal power development, which is now under way, and said that he felt confident that Winnipeg, as well as the Hydro-Electric Power Commission, would keep well within its estimate.

Town and City Planning.

The responsibility of the municipality in regard to civic improvement and beautification was dealt with in an able manner by Mr. Henry Vivian, M.P. for Birkenhead, Eng., who showed the folly of allowing cities and towns to expand without regulation or intelligent planning. Mr. Vivian was a member of the special committee appointed in 1906 by the British House of Commons to investigate the housing problem in the old country

It is interesting to note that Mr. Vivian will return to Toronto in October and assist the council to frame its application to the legislature for authority to raise money for the improvement and beautification of the city.

At the evening session the papers by Controller Spence on ''Boards of Control,'' and by A. Buschart, City Commissioner, Edmonton, Alta., on ''Municipal Goverment by Commission,'' led to a most interesting discussion, participated in by most of the representatives present. Controller Spence presented the Board of Control as a ''civic cabinet,'' responsible to the people, while Mr. Buschart presented his case on the side of business efficiency.

The sessions were brought to a close on Friday, Sept. 2nd, when the following officers were elected: President, Mayor Chisholm, Halifax, N.S.; 1st vice-president, Mayor Geary, Toronto, Ont.; 2nd vice-president, Mayor Bleau, St. Boniface, Man.; 3rd vice-president, Mayor Milne, Medicine Hat, Alta.; honorary secretary-treasurer, Mr. W. D. Lighthall, K.C., Montreal, Que. (re-elected). Mr. Charles Hopewell, Mayor of Ottawa, was elected an honorary past president of the Union.

Important Resolutions.

A number of resolutions were put through at this session, among which were the following:

"That the water powers of the country are a national asset which should be preserved for the benefit of Canada by building up Canadian municipalities; that no perpetual or long-term rights of exporting power from such sources should be granted, and that where temporary rights of export are allowed there should be clear advantage to the public interest or the public revenue.

"In view of the rapid development throughout the Dominion and consequent greater danger to the travelling public at level railway crossings, that the Union memorialize the Board of Railway Commissioners for Canada regarding the necessity of requiring the railway companies to at once proceed with the construction of effective works and appliances, at their own cost, for the convenience and safety of the travelling public.

"That the Executive of the Union of Canadian Municipalities be authorized to appoint a special committee to investigate and study the question of city and town planning, and the housing of the people, and that such committee report fully to the Union at the next convention; also, that the committee in the meantime take steps to promote and forward, so far as circumstances will permit, the recommendations made in the address delivered before this convention by Mr. Henry Vivian, M.P."

"That it was desirable a uniform system of accounting should be adopted by all municipalities throughout the Dominion; also, that each province should adopt uniform methods in recording statistics."

Master Plumbers' Convention

At the 15th annual convention of the Master Plumbers' Association, held last week at Toronto, the following officers were elected for the ensuing year: President, G. H. Cooper, Toronto; vice-president, J. E. Walsh, Montreal; secretary, L. Legrow, Toronto; treasurer, E. D. Higginbotham, Fort William. Provincial vice-presidents—Nova Scotia, F. Dexter, Truro; New Brunswick, G. E. Blake, St. John; Quebec, H. W. Munday, Montreal; Ontario, R. J. Shannon, Toronto; Manitoba, R. Thompson, Winnipeg; Saskatchewan, W. C. Heinricks, Moose Jaw; Alberta, E. J. Young, Calgary; British Columbia, R. C. Hodgson, Vancouver. Chairmen of committees—Legislative, H. A. Knox, Ottawa; Sanitary, Geo. Ross, Brockville.

The next meeting will be held at Port Arthur, Ont., in June, 1911.

The largest single piece of fabricated steel ever made in Winnipeg has just been delivered by the Manitoba Bridge & Iron Works to the new Orpheum Theatre. This steel is in the form of a plate girder, 90 feet long and 5 feet deep, weighing 17 tons. This girder, which will extend across the full width of the theatre to carry the balcony so that no columns will be necessary in the space below. The girder, when completed, will weigh 38 tons and will safely carry as many people as can possibly be crowded into the gallery. All of the steel to be used in this building is being fabricated in Winnipeg at the shops of the Manitoba Bridge & Iron Works

Johnson & Carey are now working over 600 men in their contract for filling in the railway bridge over Racing lake, near Fort Frances, Ont.

For Improved Specifications

As the result of a number of conferences between committees appointed by the Master Builders' Exchange of Philadelphia and the Philadelphia Chapter of the American Institute of Architects, a list of recommendations have been agreed upon for improving conditions in the building business of that city. These recommendations were the outgrowth of questions put to the architects by the builders and a general exchange of views between those engaged in both branches of the industry. Among the recommendations were the following:

Plans to be drawn to scale of not less than one-eighth inch to one foot.

Where party walls are used, a clause be inserted in specifications that the party wall or walls, including cost of measurer's services, etc., are to be paid for by owner.

Wells or cisterns, if accessible to contractor at time of estimate, the cost of cleaning, filling, etc., be included in contract price, provided such wells and the kind of filling required are noted on plans or distinctly called for in specifications. Wells not in evidence be considered as an extra and paid for at price mutually agreed upon.

Information relating to proposals be supplied to sub-contractor by general contractor, and all inquiries in relation to plans, etc., be sent to architects by letter from general contractor.

Depth of all foundation walls be distinctly marked on plans, and any greater depth of excavation and foundation walls to be paid for at price agreed upon before work is begun. If evident that foundation be on rock, or that blasting be required, the fact be noted in specifications. The same recommendation applies to plumbing where in excess of ordinary, such as surface water.

All plans to be finally completed before being placed in hands of contractors, and that ample time be given to make up estimates.

In case of an apparent disagreement between plans and specifications, the attention of the architects should be called to the discrepancies in order that the contractors may be notified of the explanation.

Where walls are to be furred, the same be mentioned in specifications and noted on plans.

All partitions be plainly marked as to thickness and material indicated.

Where partitions on one floor are the same as those on another floor and it is not considered necessary to draw in these partitions, the plans should be clearly and conspicuously lettered, "partitions same as ——— floor."

The detail construction of corridor partitions in office buildings, etc., be either shown on scale drawings or fully specified to convey proper information to contractor.

The questions of the freezing of walls on delayed work and the necessity of repointing, which often entails a heavy expense on the contractor, were not favorably considered by the Chapter Committee, the answer being that the contractor for brickwork or masonry, and all other mechanics should be responsible for their work and leave it in proper condition. Should an exception be taken in the case of pointing, the plasterer and paving contractor would be entitled to the same consideration, as their work also is liable to be damaged by frost.

Many Noteworthy Exhibits at Toronto

Things Worth Seeing by Constructional Men at the 32nd Annual Canadian National Exhibition — Brief Mention of Most Interesting Features

Evidence of gratifying improvement in the majority of lines pertaining to construction is to be found at the 32nd annual Canadian National Exhibition now in progress at Toronto. The exhibits generally represent the best productions in their respective fields. In most cases they are displayed to good advantage and furnish an excellent tribute to the excellence and progressiveness of Canadian manufacture.

The Exhibition Board is deserving of much credit for the enterprising arrangements made with a view to assisting exhibitors in the transportation and arrangement of their material, and few complaints are to be heard on this score. In one particular, however, there is certainly room for a little forethought next year, and that is in the provision of adequate protection for firms who have been allotted outside space for the demonstration of contractors' machinery. If it is not considered advisable to have these machines operated in the buildings, some sort of temporary shelter should be provided against the elements. A visit to the grounds one morning last week, after a heavy rain had fallen during the night, was very convincing on this point. One Western Ontario concern had an exhibit of several thousand dollars' worth of machinery, which, covered with rust and surrounded by mud, was anything but improved by these adverse conditions.

Every effort is made to develop the Canadian National Exhibition on bigger and broader lines each year. If this is to be done effectually such details as the one cited above must not be overlooked.

Brief comment is made herewith on some of the most interesting exhibits pertaining to the field covered by the "Contract Record." Pressure of space prevents a more extended reference in this issue. Possibly a few of our readers and advertisers will remind us of things we have forgotten to mention in time for the publication of such in our next issue.

Standard Glass Co., Ltd., Toronto, Ont.—An attractive line of their various products, including leaded stained glass, electric fixtures, electric and gas domes, etc.

Pilkington Bros., Ltd. (Works, St. Helens, Eng.)—Samples of polished plate and window glass. This firm manufacture sand-cut glass, bevelled plate glass, bent glass, etc.; also cast or hammered plate and other lines.

Brantford Roofing Co., Brantford, Ont.—"Brantford" asphalt, "Brantford" rubber, and "Brantford" crystal roofing. This firm supplied two-thirds of the G.T.R.'s requirements last year. A recent contract for roofing is that of the Standard Bank, at the corner of King and Jordan Sts., Toronto.

Hoidge Marble Co., Ltd., Toronto, Ont., representing Ontario Marble Quarries Co., Ltd.—The marble used in the temporary office of the Bureau of Mines in the Agricultural Building was from the Ontario Marble Quarries, and bore testimony to the beautiful effect produced with the finished material.

Dominion Sewer Pipe Co., Ltd., Toronto, Ont.—A large and interesting exhibit of salt-glazed and vitrified sewer pipe, culvert pipe, inverts, flue linings, etc. Dominion sewer pipe are impervious to water, and are manufactured in all sizes from 4 to 24 inches.

H. M. Robinson & Co., Toronto, representing the well-known English firm of Wooliscroft & Son, Ltd.—Interesting exhibit of tasteful designs in wall and floor tile.

Chamberlain Metal Weather Strip Co., Ltd., Toronto, Ont.—Demonstrating the special advantages of their product, which appears to be particularly serviceable.

Ontario Wind Engine & Pump Co., Ltd., Toronto, Ont.—Samples of their latest improved gas and gasoline engines, etc. This firm manufacture steel sub-structures of all kinds, also steel and wood tanks, hydraulic rams, etc.

Standard Sanitary Manufacturing Co., Ltd., Toronto, Ont.—A large and effective display of their well-known plumbing fixtures. The reasonable prices at which "Standard" sanitary products may be obtained make it possible to fit up quite an elaborate bathroom at a comparatively low cost. Considerable interest is taken in this exhibit, especially in the model bathroom.

Batts, Ltd., West Toronto, Ont.—A well-arranged and comprehensive display of some of their many products, which include staved columns, veneered doors, newel posts, pine doors and frames, sash, trim turned newels and balusters. The best of a number of excellent exhibits made by this firm in recent years.

Standard Ideal Co., Ltd., Port Hope, Ont.—Exhibiting high-grade enamelled baths, lavatory fittings, etc., for which plenty of inquiries are forthcoming. This firm manufacture an impermeable pipe which is well worth investigation by architects and sanitary engineers.

Ideal Concrete Machinery Co., Ltd., London, Ont.—An excellent display of concrete mixers, brick and block machines, etc. "Ideal" automatic tamper, with scraper and finisher in operation. Makes blocks automatically of all sizes. This exhibit is in charge of Mr. C. F. Pulfer, the company's energetic manager, who reports as many enquiries as he can handle.

Goldie & McCulloch Co., Ltd., Galt, Ont.—A convincing line of fireproof safes, vaults and vault doors. Interesting booklet containing photos and testimonials obtainable on application.

Royal Doulton Potteries, England. Agents: Chillas-Black, Ltd., Toronto, Ont.—Architectural terra cotta and "Carrara." Claimed that the terra cotta combines the massive appearance of stone with the fireproof qualities of brickwork, and that the appearance of the "Carrara" is not affected by smoke or dirt.

Jno. T. Hepburn, Toronto, Ont.—Showing the Hepburn Scotch Derrick, used by leading contractors in all parts of the Dominion, made in standard sizes from ¾ of a ton upwards, operated by hand or power. Also the "New State" concrete mixer, claimed to be the most practical machine on the market for mixing sand, gravel, crushed stone, cement, etc.

American Road Machine Company, of Canada, Ltd., Goderich, Ont.—Crushing and road building machinery. Exhibiting "Champion" dump wagon. An excellent line manufactured by this firm is one of the best propositions of its kind on the market.

Asbestos Manufacturing Co., Ltd., Montreal, Que.—Asbestos building lumber, corrugated sheathing, asbestos cement shingles. Products of this firm are claimed to be water and fire proof, and very durable. Asbestos lumber claimed to be indestructible by exposure to elements.

Archer Light, Heat & Power Co., Ltd., Toronto, Ont.—Hot water furnaces, bath tank heaters, etc.

Bournival & Co., Toronto, Ont.—"Field" gas and gasoline engines; also the "Champion" combination woodworker, an economical and labor saving machine for the contractor.

Smart-Turner Machine Co., Ltd., Hamilton, Ont.—Leading lines of manufacture: power and steam pumps, condensers, travelling cranes, etc. An interesting exhibit.

Johns-Manville Co., Ltd., Toronto, Ont.—Fireproofing of all kinds, asbestos roofing, etc.

Canadian Producer & Gas Engine Co., Ltd., Toronto, Ont.—Producer gas power plants, claimed to represent the "acme of power economy."

H. W. Petrie, Ltd., Toronto, Ont.—Comprehensive line of machine supplies and transmission. Much interest is being taken in the Keighley gas engine in operation.

N. J. Holden Co., Ltd., Montreal.—A comprehensive and interesting exhibit of railway and contractors' supplies. The various tools and appliances shown by this firm are well known and receive a great deal of attention at the hands of the contracting interests. The Maxwell Deformed Bar, for concrete reinforcement, placed on the market by this company last Fall, is earning an excellent reputation.

London Concrete Machinery Co., Ltd., London, Ont.—One of the best displays of concrete machinery at the Show, and probably the largest exhibit of the kind ever made by one firm at a Canadian exhibition. The company are showing most of their leading lines, including the London automatic batch concrete mixer and the London automatic cement drain tile machine. (We learn with interest that this company will commence shortly the erection of a new plant ten times the capacity of their present factory.)

Amherst Foundry Co., Ltd., Amherst, N.S. (represented by Ontario agents: Monarch Brass Manufacturing Co., Ltd., Toronto.)—A comprehensive line of Beaver Brand porcelain enamelled sanitary ware. The attention paid to this exhibit is sufficient evidence of the increasing popularity of the Amherst Company's products. The plumbers' supplies shown by the Monarch Company are also of much interest, representing a considerable number of new designs in valves, etc.

Standard Paint Company of Canada, Ltd., Montreal, Que.—Devote most of their time at the Show to explaining the merits of Ruberoid Roofing. Ruberoid contains no rubber, tar or asbestos. It is claimed to represent the last word in permanent, fire-resisting roofing material.

Berg Machine Manufacturing Co., Ltd., Toronto, Ont.—Demonstrating the latest improvements made in the realm of the brick manufacturer. The products of this firm are of neat design and well calculated to meet every requirement affecting durability and cost. The "Style A" pressed brick machine, with a capacity of 35,000 to 50,000 brick per day, is one of the firm's best lines.

Merillat Culvert Core Co., Winfield, Iowa.—Demonstrating an adjustable culvert core for sizes between 20 and 48 inches. This machine is expansible, collapsible and portable. It is extremely simple in operation, and has done well on the Canadian market since its introduction at the Cement Show at London in the spring. Mr. Merillat informs us that a Canadian company is now being organized.

Corrugated Pipe Co., Ltd., Stratford, Ont.—Showing their product in a number of different sizes. Special merits claimed to be strength, durability and economy. The company guarantee their culverts, which are made exclusively under the Moore & Hall patents, for 20 years if placed properly.

Waterous Engine Works, Ltd., Brantford, Ont.—Featuring the Seagrave fire apparatus. The steam road rollers manufactured by this company have many claims to superiority. Each roller manufactured at the Waterous Works is subjected to a vigorous test before shipment, with the result that the machines are absolutely reliable as regards operation and durability.

F. W. Bird & Son, Hamilton, Ont.—Samples of "Neponset" products. "Neponset paroid" roofing is easy to apply and guaranteed to stand the tests of time and wear. It is made from high-grade material, and treated with a preparation that renders it strictly waterproof.

Berry Bros., Ltd., Detroit, Mich.—Specimens of work finished with the varnishes manufactured by this firm, claimed to give the best results in staining, shellacking and finishing.

Down Draft Furnace Co., Ltd., Galt, Ont.—Demonstrating among other things the ready adaptability and other merits of their coal and wood chutes.

Imperial Plaster Co., Ltd., Toronto, Ont.—"Wood Fibre Plaster" and the advantages that commend it to architects and builders are the centre of interest at this booth.

Factory Products, Ltd., Toronto, Ont.—Noteworthy exhibit demonstrating principally the excellent lighting capacities of "Osram" lamps. This company is the Canadian agent of Stothert & Pitt, Bath, Eng., manufacturers of travelling cranes and hoisting machinery, Mr. H. G. Nicholls being the general manager.

Cement Tile Machinery Co., Chatham, Ont.—The Schenk machine manufactured by this concern is the first of its kind manufactured in the United States or Canada. It is sold on a guarantee and is claimed to be very speedy and profitable in operation.

F. Sturgeon, Toronto, Canadian agent for Major & Co., Ltd., Hull, Eng.—Demonstrating the appliance and advantages of Solignum, a wood preservative and stain that is claimed to be an absolute preventive against decay.

Richards Bros., Toronto, Ont.—Kelsey warm air generator, an excellent system of heating and ventilating for churches, schools and residences. 37,000 Kelseys in use.

Wettlaufer Bros., Toronto, Ont.—An interesting line of mixers and other machinery for cement users.

Pease Foundry Co., Ltd., Toronto, Ont.—"Economic" boilers and furnaces, also the new "Economic" blower for ventilating and heating public buildings.

Northern Electric & Manufacturing Co., Ltd., Toronto, Ont.—Demonstrating the operation of their fire alarm equipment as adopted by the city of Toronto. Also the advantages and low cost of operation of their inter-phones, well worth investigating by business concerns.

North Lanark Marble & Granite Quarries, St. Catharines, Ont.—Beautiful samples of verde antique marble.

Milton Pressed Brick Co., Ltd., Milton, Ont.—Various samples of dark red and buff pressed brick and other products well known to the trade.

Gurney-Tilden, Ltd., Hamilton, Ont.—The builders' hardware shown by this firm is worthy of special inspection by architects and builders. In excellence of manufacture it compares favorably with any of the U. S. products. Also "New Idea" furnaces, boilers and radiators.

Canada Cement Co., Ltd., Montreal, Que.—Materials used in the manufacture of high-grade Portland cement.

W. D. Beath & Son, Toronto, Ont.—Adjustable parlor and barn door rollers. The triangle mesh concrete reinforcement manufactured by this firm is being used to a greatly increasing extent, and their business is growing very rapidly.

Jas. Morrison Brass Mfg. Co., Ltd., Toronto, Ont.—Electric fixtures and brass goods of all kinds.

Positive Clutch & Pulley Works, Ltd., Toronto.—Demonstrating the combined jaw and friction clutch, the [illegible] bination of the kind to be placed on the market. The materials entering into the manufacture of this clutch have been carefully selected, and the parts being interchangeable it should have strong claims for inspection.

Dominion Roofing & Supply Co., Toronto, Ont.—Roofing materials. Feature: sample of Malthite asphalt roofing. Malthite roofing material is saturated and coated with natural asphalt and is said to be especially durable.

George B. Meadows Wire, Iron & Brass Works Co., Ltd., Toronto, Ont.—Comprehensive line of their various products. Builders' iron work, ornamental iron fences and metal lockers, of special interest. One of the most artistic displays at the Exhibition.

Canadian Steam Boiler Equipment Co., Ltd., Toronto, Ont.—Economic vacuum steam heating specialties.

Among other interesting exhibits may be mentioned those of the Butterworth Foundry Co., Ottawa; Jas. Stewart Manufacturing Co., Ltd., Woodstock; Norsworthy Co., Ltd., St. Thomas; Wizard Furnace Co., Ltd., Toronto; Peerless Furnace Co., Toronto; McClary's, London, represented by David Millar, Toronto; Hall Zryd Foundry Co., Ltd., Grimsby; A. Welch & Son, Toronto.

Royal Architectural Institute

Concluding Details of 3rd Annual Meeting at Winnipeg—Proposed Federation of Provincial Associations

A preliminary report of the 3rd annual assembly of the Royal Architectural Institute of Canada, at Winnipeg, which was held during the last week of August, appeared in our last issue, together with a list of the new officers. Since going to press, we have received further details which may be of interest.

In addition to the names published in our previous issue, the following gentlemen were elected to the council of the Institute: W. H. Archer, Vancouver, A.I.A.; C. B. Chappell, Prince Edward Island; A. F. Dunlop, Montreal, R.C.A., P.Q.A.A.; D. Ewart, Ottawa, I.S.O., O.A.A.; C. E. Fairweather, St. John; H. E. Gates, Halifax; H. B. Gordon, Toronto, O.A.A.; E. L. Horwood, Ottawa, O.A.A.; J. P. Hynes, Toronto, T.S.A.; R. P. Lemay, P.Q.A.A., Quebec; C. P. Meredith, Ottawa; G. A. Monette, Montreal, P.Q.A.A.; James A. Wise, A.A.A., Edmonton, and Sam Hooper, Winnipeg, M.A.A.

The federation of the various provincial associations of Canada under the Royal Institute was brought up at the closing business session. It was announced by the president to be the most important business which had been brought before the assembly. "It means," he said, "that instead of continuing as an absolutely independent organization, as at present, the Association will become the parent body of the various associations of the Dominion. The motion to change the charter to permit of the change is being made at the request contained in a joint resolution of the four established provincial associations. The matter has been very thoroughly considered by this council, and if the motion carries, the council will be given full power to deal with the matter and apply for the powers necessary to effect confederation. If the proposal fails, then the Institute will continue as at present. As I have said, the motion is the result of the application of the provincial bodies. We are certain of their co-operation in the matter, and it simply remains for the details to be decided upon."

Upon the platform with the President during the hearing of this problem were: Mr. Edmund Burke, representing the Ontario Association; Mr. Joseph Gardiner, for Quebec, and Mr. J. H. G. Russell, for Manitoba. While the importance of the matter was generally recognized, the preliminary canvass had completely covered all details, and in the main discussion there was little dissention.

Federation and Protection

A motion, which read as follows, was introduced by Mr. Edmund Burke, of Toronto, seconded by Mr. E. L. Horwood, of Ottawa, and carried unanimously: "The council be hereby empowered to obtain amendments to the charter of the Royal Architectural Institute of Canada, and to take the other steps necessary to alter the constitution of the Royal Architectural Institute of Canada, to comply with the request in the joint resolution of all the offiical provincial associations throughout Canada to form the R.A.I.C., into a federation of official provincial architectural bodies, with the approval of such official bodies."

Among the important papers of the convention were those of Mr. Isaac Campbell, K.C., on "Architectural Jurisprudence" (extract published in this issue), and Prof. P. E. Nobbs, of McGill, on "Canadian Architecture." Mr. Joseph Greenfield, past president of the Manitoba Association, was scheduled to present a paper on the architecture of the west, but, owing to serious illness, he was unable to attend the convention, and Mr. S. F. Peters, of Winnipeg, undertook to fill the vacancy. Mr. Peter's paper will appear in our next issue.

When the matter of providing better protection for Canadian architects was brought before the assembly, Mr. S. Frank Peters, of Winnipeg, made a motion, which read: "That the Canadian Government be asked to increase the duties on the service of foreign architects." In the discussion which ensued, a general rate of 2½ per cent. on all services was suggested, but the convention finally adopted a blanket resolution which paves the way for an increase without stipulating the amount.

Outside the business sessions of the assembly, the time of the delegates was occupied in a continual round of entertainments and luncheons. Trips were made to the Garson Quarries, at Tyndall, and to the St. Andrew's Locks.

The paper on Canadian Architecture, prepared for the convention by Professor Percy E. Nobbs of McGill University, Montreal, was read in his absence by Mr. H. E. Matthews.

It was decided to hold the next annual convention at Montreal.

Representative Attendance at Banquet

The annual banquet of the Institute was held at the Royal Alexandra Hotel on Friday, August 26th, and proved a most enjoyable function. The attendance numbered about fifty. Mr. F. S. Baker occupied the chair. Those present included: H. B. Gordon and Edmund Burke, Toronto; Alcide Chausse, J. Rawson Gardiner, Montreal; T. Chapman Clemesha, Regina; David Webster, Saskatoon; Chas. F. Burden, Massey, Ont.; E. L. Horwood and J. H. Watt, Ottawa, and from Winnipeg: W. H. Carter, president Builders' Exchange; T. W. Drewry, president Board of Trade, and E. H. Rodgers, J. Prendergast, J. Woodman, Wm. Fingland, F. S. Murdock, W. A. Elliott, Fred G. Pusey, J. D. Matheson, Sam Hooper, J. H. G. Russell, S. Frank Peters, D. A. Ross, Herb B. Rugh, W. Percy Over, H. E. Mathews, L. P. Kenwick, W. B. Lait, A. J. Rowley, Geo. H. Measham, Harold Edwards, Hector L. Chalmers, Hart Leech, G. Chignell, Lawrence Hooper, John Hooper, Geo. W. Goodall, William T. Davis, R. O. McGougan, R. B. Pratt and D. W. F. Nichols.

The toast of the King was proposed by Mr. H. B. Gordon of Toronto, and duly honored. Mr. Gordon spoke of the wonderful progress that had been made in the western city during recent years.

"Sister Societies" was proposed by Mr. E. L. Horwood of Ottawa and responded to by representatives from four provincial organizations, Messrs. Russell, Burke, Chausse, Gardiner and Clemesha.

Settlement of Winnipeg Strike

Interesting Statement by Mr. Peter Lyall, Sr.—Items of Interest from Architects and Contractors

Winnipeg, Sept. 3rd, 1910.

Good progress is being made on civic contract work. At the McPhillips Street subway Jno. Gunn & Sons are making rapid strides. The preliminary construction for the overhead bridge on Arlington Street, formerly Brown and Brant Streets, is being pushed ahead by Contractor Newman. Thos. Kelley & Sons are making good progress with the Pembina Street subway.

Provincial Architects' Association and Competitive Plans.

A protest has been made in writing, for the Architects' Association of the province, against the changing of the draft advertisement for competitive plans for a tubercular hospital by the city. The co-operation of the president of the Association was asked by the city and given, but his suggestions were afterwards altered and the Association objects. Two clauses caused the friction. One provided that a member of the Architects' Association be one of the judges of the plans submitted. The other restricted drawings to resident architects. In the first case the city struck out the clause pertaining to the judging. It was intended to secure professional opinion on the plans, but by letting the clause go providing for a member of the Association as judge the board felt that it was recognizing the organization, and as there were a number of architects of the city not connected with it, this was deemed unfair. The other clause, if inserted, would bar the plans of Dr. Sharpe, which were considered meritorious and eligible for the competition.

The Association now bases its chief protest on the striking from the draft the condition of judging, asserting that after the architects spent so much labor on the plans it would be unjust to them not to have professional judges technically qualified to select the most advantageous drawings. The letter has been sent to the Board of Control, but has not yet been dealt with.

Peter Lyall on the Labor Situation.

Upon his arrival in the city from Montreal last week Mr. Peter Lyall, Sr., discussed the present labor troubles of his own firm, Peter Lyall & Sons, of Montreal, and the firm of Lyall-Mitchell, of which his son, Peter Lyall, Jr., is managing director, reaffirming the statement made by his son that the two firms are distinctly separate. Mr. Lyall, Sr., states that he has an interest, less than one-third, in the Winnipeg firm, but that he takes absolutely no hand in its management in any way. Also he states that Peter Lyall, Jr., has not, and never had, any direct connection with the Montreal firm and has no pecuniary interest whatever in it.

About two years ago, Mr. Lyall explained, his firm declared for the open shop at Montreal, simply because the union there had become affiliated with the international union, and he found that his men were being dictated to by alien agitators. He simply refused to recognize the union. Some little time ago the international union demanded that his foreman at Montreal become a member of the union, and Mr. Lyall refused to sanction this arbitrary demand, although he believes that some of his men were and had been members of the union. This precipitated the strike at Montreal, which was followed by a walkout of the masons and bricklayers at Regina, where the contract for the new parliament buildings and the hospital is held by the Montreal firm.

As to the situation in Winnipeg, Mr. Lyall, Sr., had nothing to say, as he had never had anything to do with the active management of the local firm. He offered the opinion, however, that the men had acted unfairly, and in direct violation of a signed agreement and the finding of an arbitration board provided for in the agreement.

Reverting to conditions at Montreal, Mr. Lyall stated that work on the several big contracts his firm has there was not interfered with to any extent by the strike, as the strikers had been readily replaced. At one time he had made arrangements to import a number of Scottish masons and bricklayers, but the order was countermanded when it was found that enough men could be obtained in Canada. He thought the men ill-advised in their action in the present state of the labor market in the Old Country and the freedom of the contractors to bring into Canada workmen who are British subjects. If forced to import men by the action of the international union, he would not hesitate to do so, but at present he has all the men required on the contracts under way.

Concerning Professional Labor Leaders.

"I am in deep sympathy with the men, and a firm believer in unions," he added, "but Canadians should belong to Canadian unions, and not have their bread and butter dependent on the manipulations of foreign professional labor leaders. I believe thoroughly in a Canadian federation of labor unions, and think it could be made successful. I pay the highest union wages, and do not interfere with any man in his union connections. I simply refuse to recognize an international union which takes the money of Canadian workmen and puts over them professional leaders, whose very jobs depend on fermenting labor trouble. I was a workman and a union man myself for many a year, but I did not belong to an American union."

Strike Settled by Arbitration

A board of arbitration, the appointment of which was brought about by Mayor Evans, vindicated the action of the Builders' Exchange in forcing a lockout and ordered the striking bricklayers and masons back to work on the Lyall-Mitchell contracts. The action of the international union in ordering out the workers on the Lyall-Mitchell contracts was heavily censured.

The effect of the lockout and strike upon the building situation has not been very serious. Owners of buildings under construction were beginning to grow anxious, when the Mayor intervened and brought about what proved the settlement. It is stated that these owners approached the contractors and informed them that it was desirable to call off the trouble and get down to work, thereby insuring the completion of works. The arbitration movement was partly a result of this.

The proceedings before the arbitration board were devoid of features. Mr. Lyall simply submitted evidence as to the ownership of his firm and proved conclusively that there was no connection with his father's business in Montreal. Geeves, representing the union, deplored the fact that this information had not been given the men earlier, so as to prevent the strike, but this was ridiculous in view of the fact that identically the same evidence had been presented before the strike commenced.

The members of the Builders' Exchange are now endeavoring to find some method by which a repetition of the trouble can be guarded against. Clauses 5 and 6 of the present working agreement between the union and the contractors stipulates that the men shall not walk out without first calling an arbitration board, but in this instance the clauses were ignored.

One undoubted effect of the strike and lockout in Winnipeg was to hush up all information concerning projected work. A round of the architects' offices this week, in search of information of new work, was met everywhere with evasive replies which boded well for the future, but left the present in doubt. The object of this move was evidently to abstain from giving the men the impression that business was so heavy that they could afford to hold off.

Mr. Alcide Chausse, building inspector of Montreal, has been asked to attend the Town Planning Conference, which is to be held in London early in October, under the auspices of the Royal Institute of British Architects.

Shortage of Cement at the Coast

Building operations at Victoria, B.C., are reported to be seriously hampered by a shortage of cement. For the past month the situation has been almost acute. Cement has been brought into the city from Seattle and other points, but so great is the demand that supplies are inadequate. Last week a supply arrived from the Old Country on the Blue Funnel boat, some 1,000 barrels, but this will only meet immediate demand and make no provision for the future. The same trouble is being experienced at Vancouver. This cement shortage is seriously affecting civic sidewalk work, and in combination with a shortage of gravel, is holding up progress on several of the street works.

Building Operations at Fort William

Fort William, Ont., has been a scene of remarkable building activity this season. The progress made is particularly noticeable. Real estate men state, however, that there is a shortage of houses for renting purposes. One of the most interesting works is that being done by the Canadian Stewart Company in the additions to the Consolidated elevator. The walls have all been constructed and the machinery is being installed in the workhouse, which will be in operation September 15. The storage house will be completed by November 30. With the completion of the annex the capacity of the Consolidated elevator will be doubled. The storage capacity will be increased from 850,000 bushels to 1,700,000.

Contractors Seaman and Penniman have a large force of men working on the construction of the main building at the West Algoma Agricultural Fair Ground. The structure will be 80 by 120 feet. The total height of the building will be 45 feet, with a gallery around the entire centre portion, which will be supported by five large trusses.

The contractor for the alteration to one of Winnipeg's city churches is a Toronto man, named Van der Feen. This gentleman is a recent arrival from Amsterdam, where he is considered something of an expert on church decoration.

Vancouver Builders' Exchange Working for Industrial Peace

The work of the National Industrial Peace Association, which has for its object the establishing and maintaining of more harmonious relations between employee and employer, received the endorsement of the Vancouver Builders' Exchange recently in the adoption of the following resolution after an address delivered by Mr. P. H. Scullin of San Francisco, a representative of the society:

"Resolved, that we, the members of the Vancouver, B.C., Builders' Exchange, in special meeting assembled for the purpose of investigating the educational work, plans and purposes of the association, do most heartily endorse the same, and call upon our fair-minded citizens, in every walk of life, to give their earnest support to this humane and patriotic effort for our city's and country's good."

Port Mann, B. C. the C. N. R. Terminal

There are fresh evidences of the intention of the C. N. R. to make Port Mann, opposite New Westminster, their main terminal on the Pacific coast. It is stated on the authority of the head office of the company that the plans for the railway yards along the waterfront have been greatly extended.

Under the revised scheme the business and residential section of Port Mann will be shifted back to the sloping hillside, extending southward in a series of terraces. Along the two-mile waterfront sites will be reserved for wharves, grain elevators, freight sheds and factories. Surveyors are still at work locating the boundaries of the townsite as a preliminary to undertaking the subdivision of the big area into lots.

The work of laying out the yards has been entrusted to Mr. W. G. Swan, division engineer, who will act under the direction of Mr. T. H. White, chief engineer. Mr. Swan's staff has nearly completed the taking of soundings for the initial wharf to be located about a mile and a half above the railway bridge. The wharf will be 1,000 feet long.

Grading and clearing of right-of-way between Port Mann and Chilliwack, a distance of sixty-six miles, is now in progress. A return received by the chief engineer shows that 880 men are employed by the various sub-contractors in the eight construction camps established along the route through Fraser River Valley.

Brandon Wants Labor Badly

The scarcity of labor at Brandon, Man., is acute. Contractors in that city are offering higher wages than ever before, but the supply is not one-half equal to the demand.

On one piece of construction, that of the excavation being carried out for the public heating system mains, the work is being held back on account of the inability to secure laborers. At the present time Contractor Bullock, who has the work in hand, is advertising for seventy-five more men to go to work at $2.50 a day.

On the large business block being constructed for the McKenzie Co. on Ninth Street the need of more help is also badly felt. This block, which will practically contain more floor space than any other structure in the city owned by one business concern, is being constructed of reinforced concrete, and must, therefore, be completed before the cold weather sets in.

These two cases are cited as an indication of existing affairs in the city. The problem is a serious one for the Brandon contractors, as at this period of the year time is the essence of the whole business.

Personal and General Notes

Contractor Cream, of Edmonton, Alta., sustained severe injuries last week in falling from the city power house to the concrete floor of the building.

Controller Ward, of Winnipeg, returned home last week from St. Paul, Minn., where he attended the convention of the League of American Municipalities.

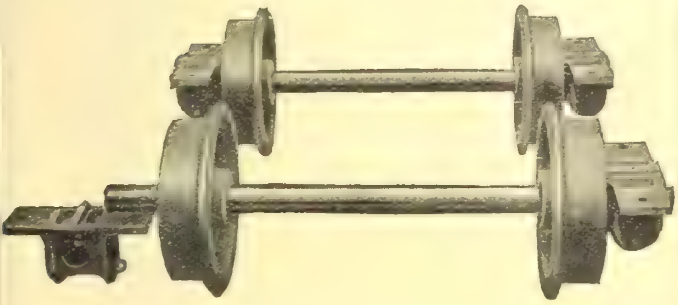
The sheet metal workers' union of Edmonton declared a strike last week for the recognition of the union and the fixing of a minimum rate of 50 cents per hour for an eight-hour day.

As the result of the combined calls of railway contractors and Western farmers, the labor market has suffered, and at Fort William it is difficult to procure ordinary laborers for $2.50 per day. It is estimated that Fort William and Port Arthur employment agents have sent out less than 4,000 hands during the summer to Manitoba, Saskatchewan and British Columbia construction camps.

The death occurred last week at Boscombe, Eng., of Mr. J. M. Gander, a well-known Toronto contractor, and for almost thirty years a resident of the Queen City. The late Mr. Gander came to Toronto from England in 1871. He was a former president of the Toronto Builders' Exchange and was at one time chairman of the Technical School Board. He returned to England a year ago owing to failing health.

The Montreal Board of Control is on the war-path hunting for paving contractors who are not giving first-class construction to the city. Last week a flaw was discovered in a cement

Build Your Own Cars Using Our Irons



Your cars will cost you less, and will be built just to your liking.

We make a business of manufacturing car wheels, axles and boxes.

We employ expert, high-priced metallurgists to regulate the composition of iron in our wheels and get just the right chill.

We guarantee our car wheels to be strong, tough and well chilled, ensuring long service.

We make wheels any size, fit them to axles for any gauge track, and supply any style of box required.

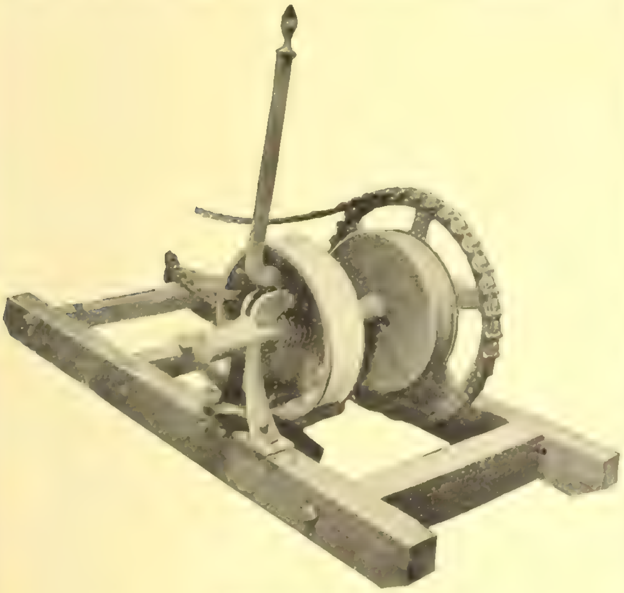
Let us quote you.

Marsh & Henthorn, Limited

Makers of Hoisting Machinery **Belleville, Ont.**

Sales Agents: MUSSENS LIMITED, Montreal

DO YOU WANT A GOOD HOIST ?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited

Engineers and Machinists London, Canada

> *"The durability of a building is the gauge of its value from an economic standpoint."*
>
> *—The Philosopher of Metal Town.*

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality OLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1955

The Metallic Roofing Co Limited

TORONTO & WINNIPEG

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

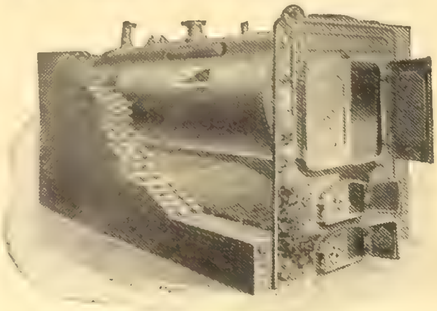
We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO



STEAM HEATING BOILERS

OF ALL SIZES
FOR
Public Buildings

Manufactured
as a Specialty

Quotations and
Information given by

E. LEONARD & SONS, Engine and Boiler Manufacturers, **LONDON, ONT**

Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

JAMES BRODIE & CO.
Quarriers and Manufacturers of
Canadian Quinsy, Ebony and Stanstead Granite
Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty
IBERVILLE, QUE.

Canada Lumberman & Wood Worker
Toronto, Canada

walk on St. Hubert St. The Board decided to notify the contractor that he must do this work over again; should he refuse, he will not be paid for what he has done. The Board is determined that a thorough inspection shall be made of all the work that has been done this summer by contractors. Any contractor who is found to have shirked the specifications will be brought promptly to time.

Railroad Intelligence

A jury at Weyburn, Sask., which has been investigating the death of D. M. McLean, the sub-contractor on the G. T. P. near Cordeaux, about 18 miles from Weyburn, has returned a verdict that he came to his death by the accidental discharge of a gun.

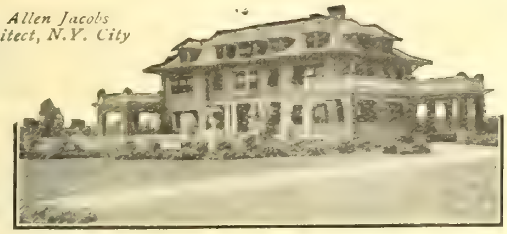
It is reported that construction work will be started soon on the Alberta and Great Western Waterways Railway, which is surveyed to run from Edmonton, Alberta, to Fort McMurray. W. R. Clarke and J. A. L. Waddell, both of Kansas City, Mo., are president and chief engineer respectively of the road.

Officials of the Canadian Pacific Railway at Winnipeg have announced that the double track between Winnipeg and Portage la Prairie will be in operation by Sept. 15. Double tracking will be continued to Brandon, grading being under way, and steel may be laid this year if conditions are favorable.

The Canadian Northern Railway is reported to have completed arrangements with the Council of the city of St. Boniface, Man., for extensive improvements there within the next two years, including a large roundhouse, storehouses, coal warehouses, freight sheds, the union depot to be shared with the G. T. P., and a new traffic bridge to be built across the Red River from Winnipeg. The total improvements will cost over $1,000,000, and the company has signed a bond guaranteeing the completion of the work within two years.

Instead of double tracking its line from Smith's Falls to Peterboro, as originally planned, the Canadian Pacific Railway is now said to be planning in the near future to build an entirely new road west from Smith's Falls to Toronto through a country a part of which at least is not at present served by a line of railway. A survey party has been looking over the country between Smith's Falls and Belleville, and everything is said to have been practically arranged for the building of a line between these two points and from Belleville to Toronto. The survey is already made from Belleville to Toronto. The new line will run north of the Rideau Lakes, the present line being in all probability used to either Perth or Bathurst,

According to a statement of C. M. Hays, the Grand Trunk Pacific management expects to have the main line completed into Prince Rupert in 1912, or 1913 at the latest. The rapidity of construction hinges upon labor conditions, which this year have been very unfavorable. On the main line and prairie branches construction gangs are deficient to the number of 5,000 men. Two exploratory parties are now engaged making a reconnaissance in connection with the proposed branch from the main line to Vancouver. One party is working south from a point near Fort George. This would indicate that its starting point may be farther east than was originally proposed. The other party is working north from Lytton. The determination of the route into Vancouver, whether by way of the Lillooet country, branching off from the Fraser above Clinton, or by way of Lytton, has been left for future consideration. Construction will not be undertaken until the main line is completed. No purchases of terminals or waterfront in Vancouver or vicinity have been or are contemplated at present. False Creek as a terminal is still regarded with favor by the management.



Harry Allen Jacobs
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving strains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Sand & Supplies
LIMITED
Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite
Crushed Stone and
Sewer Pipe

M. 4507

Summer Contracts

Architects and contractors who are desirous of making or of keeping a good reputation will act in their own interests by specifying

Port Credit Brick

We have recently made extensive enlargements and improvements to our plant and have now one of the finest equipments in America.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES

True to Size.
Impervious to Water.
Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe

Single and Double Strength. Sizes 3" to 42"

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

J. H. NEW
President

RYLAND H. NEW
Vice-President

Hamilton Vitrified Salt Glazed Sewer Pipe
Acknowledged by **all Engineers** to be
More **durable** and **superior**
In every way than other makes.
Let us tell you where we **excel**
The **delivery** that we give, cannot be
Obtained from other manufacturers.
No order too small, none too large.

Price lists, discounts and all other
Information furnished promptly on request.
Price always consistent with market values.
Experience "50 years in the Business."

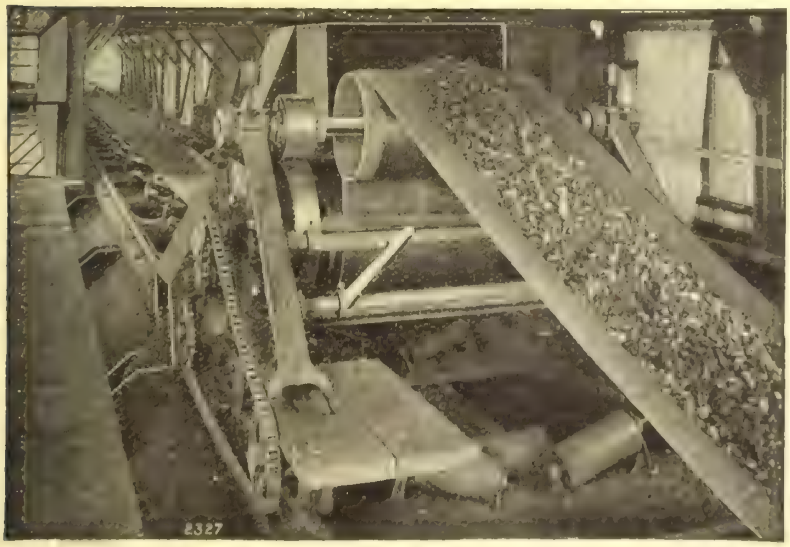
The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or Write us

Hamilton and Toronto

Scandinavia Belting

FOR TRANSMISSION AND CONVEYING



A 30" Extra Stout Scandinavia Belt in Operation Carrying Coal.

A Solid-woven, Impregnated Textile belt.

Equally good in wet and dry places.

Not made in plies and will not come apart.

Made in three weights and in widths up to 60 inches.

WE GUARANTEE that this belt on a basis of price will give you better service than any belt on the market.

Write for Bulletin "A" and Discounts to

Federal Engineering & Supplies Limited

284 Yonge St. - TORONTO

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

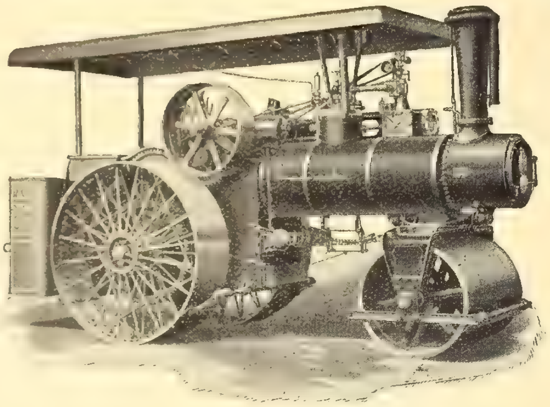
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

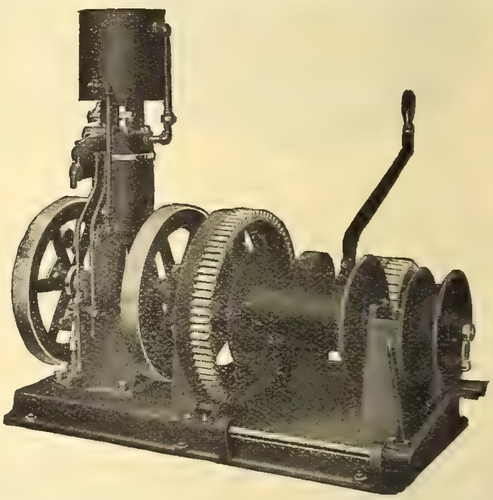
J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.

Hamilton, Ont.

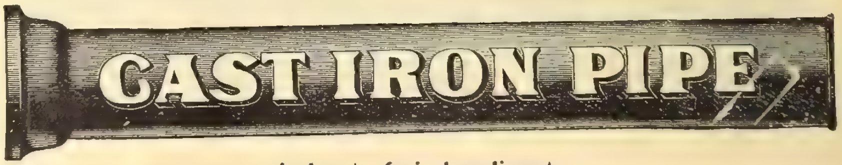
JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

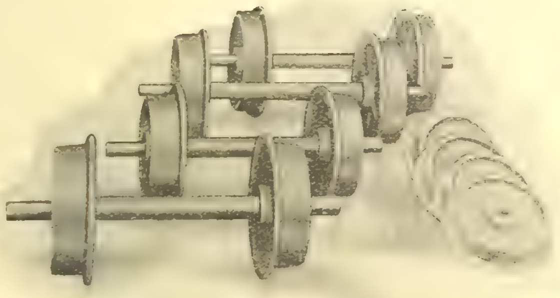
Flexible and Flange Pipe,
Special Castings and all kinds of
Waterworks Supplies.



3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business

Write our nearest plant for further information as to prices, deliveries. etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N.S.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE -Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
CONSULTING ENGINEER
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.
405 Dorchester Street West, MONTREAL

John. T. Farmer
MECHANICAL AND
HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising Engineers
Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants
Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.
BARBER & YOUNG
Bridge and Structural Engineers
Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.
'Phones { Day, M. 1664
Night, C. 118 or N. 3217
57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.
Consulting Engineer
Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work
Continental Life Bldg. TORONTO

The John Galt Engineering Co.
Consulting, Civil and
Sanitary Engineers
General Municipal Engineering
Specialties: { Waterworks, Sewerage and Electric Lighting.
Toronto and Winnipeg
John Galt John Haddin

NADEL & ADLER
375 St. James St., MONTREAL
The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

The KATIE Foundry,
Galt, Ont.
Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.
CONSULTING ENGINEERS
VACUUM STEAM HEATING and DRYING SYSTEMS
Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.
Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.
67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Conrractors, Switches, Girders, etc. New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street, W, TORONTO

Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

TRADE MARK TAMCO
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on Application
Rose and Pink Granite Quarries at Stayner-ville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g
224 St. James St. Montreal
Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to colo., 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

J. R. Painchaud, Montreal, Que, electrician, it is stated has assigned to Alex. Desmarteau.

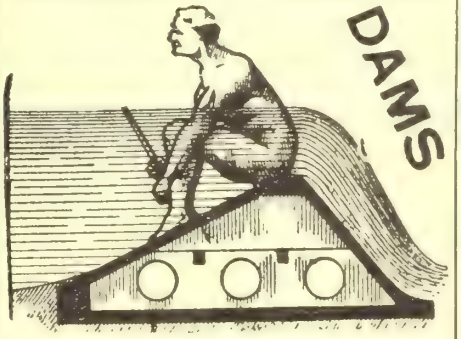
It is stated that Leblanc & Richard, sash and door manufacturers, Asbestos, Que. have dissolved.

It is stated that Maryfield Lumber & Hardware Company, Maryfield, Sask., have sold their hardware business to J. B. Stallwood and lumber to W. A. Taber.

The Goldie & McCulloch Company, Limited, Galt, Ont., manufacturers of mill machinery, safes, etc., have sold woodworking machinery department to Canada Machinery Corporation, Limited, Galt, Ont.

The B. C. Gazette gives notice of the incorporation of the following companies: Canadian Western Lumber Company, Limited, capital $10,000,000; British Empire Timber Company, Limited, capital $1,500,000; Wells Construction Company, capital $25,000; The John McDougall Caledonian Iron Works Company, Limited, capital $500,000.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

WIARTON STONE QUARRY
J. S. Cook, Proprietor Wiarton, Ont.
All kinds of Building Stone, Coping, etc.
Cut to order or shipped direct from Wiarton Quarry
Get my prices before placing your order

J. HARVEY
CONTRACTOR
Greenaville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

German Alsen, at **higher prices** than competitors, has again this year been awarded the **most important contracts** of the World, because practical tests by leading Engineers proved its merit and **relative economy.**

Note the following:

	1905-1906		1905-1909
Mexico City	**120,000 bbls.**	**U.S. Philippine Govmt.**	**40,000 bbls.**
Necaxa Dam (shipping instructions so far 60,000 bbls.) approximate amount	**175,000 bbls.**	**Govmt. Order South America**	**150,000 bbls.**
Xochimilco Water Works. Mex. approx.	**200,000 bbls.**	**Rio de Janeiro, Satos, etc.**	**40,000 bbls.**

Also enormous quantites for the Pacific Coast, Australia, England, South Africa, &c.

There is always a certain trade who WILL PAY for THE BEST. We also American Alsen, the highest grade of domestic Portland Cement.

Cement 45 BROADWAY - NEW YORK CITY **Cement**

We protect our customers! - See page 155 in "Sweets" for full particulars.

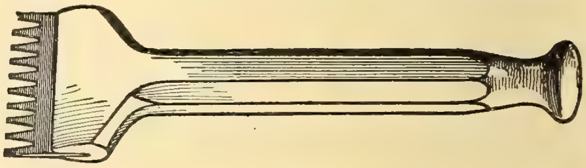
Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.



The
"Simplex" Stone and Marble Cutter

Does away with sharpening of tools. When the teeth are worn replace with a new blade. The new blades are cheaper than sharpening, and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

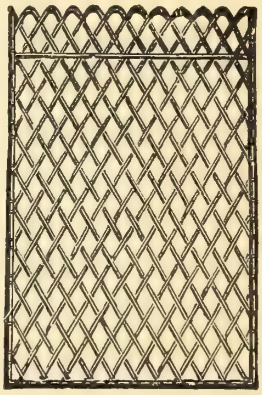
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

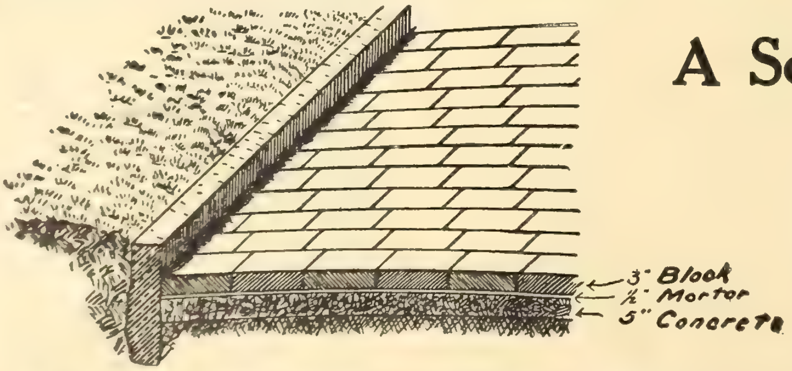
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co., Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by
Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

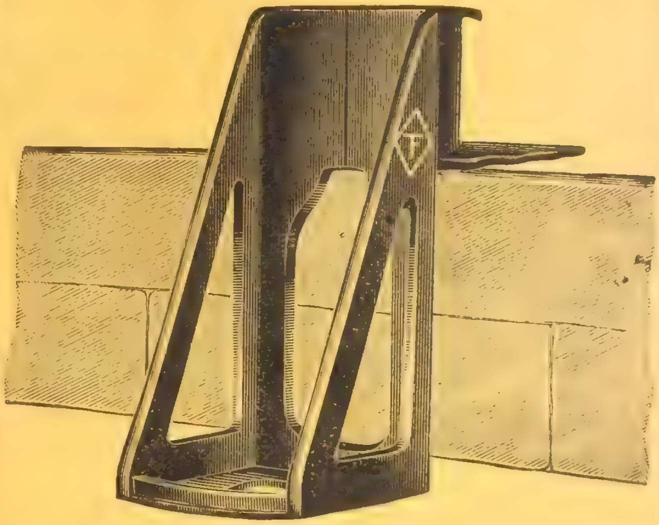
It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited

GUELPH, ONTARIO

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee

Reducing in Run or Branch

Standard Fitting & Valve Co.

Limited

GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

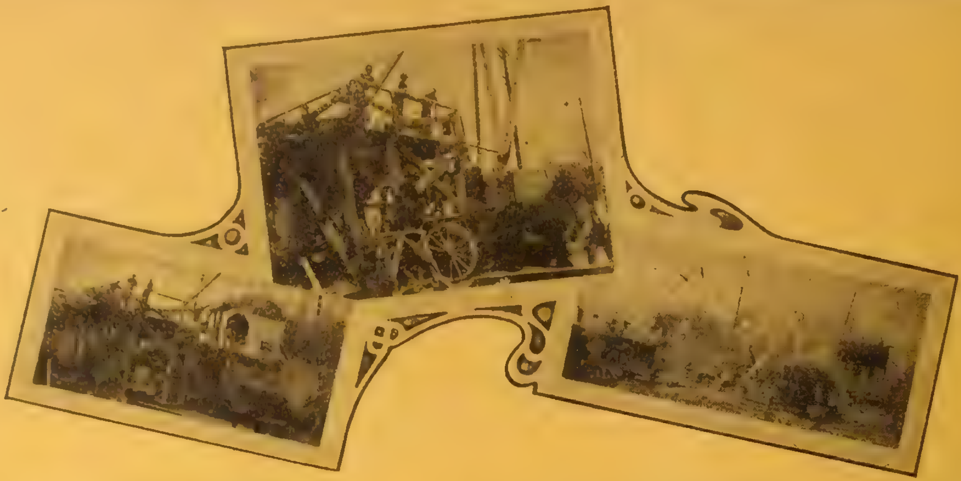
Give us a trial order

Our work will convince you

Georgian Bay Shook Mills

Limited

Midland, Ontario

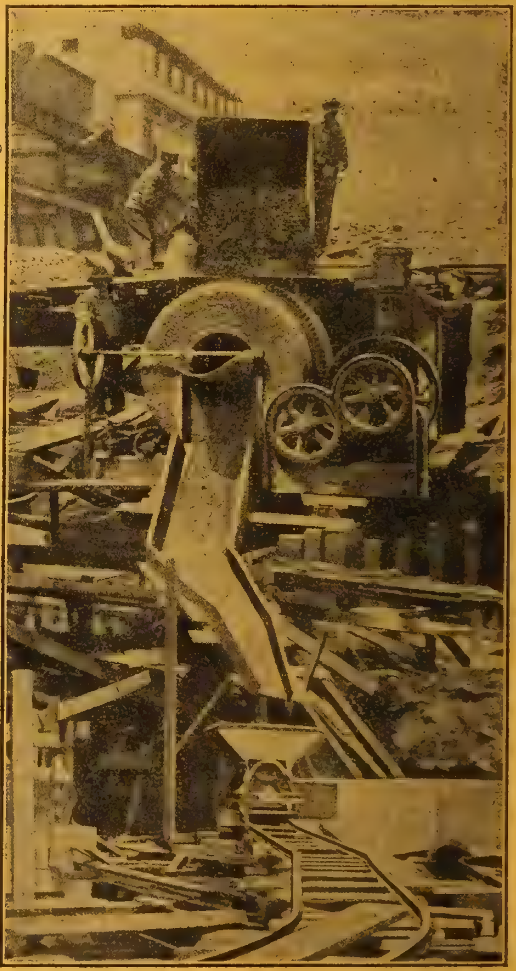


Ransome Concrete Mixers

are being used on all large Contracts To-Day

Ransome Mixers have proved time and again that they will stand up under the most severe usage. No intricate parts to get out of order. Simple and durable. A Concrete Mixer to rely upon and will save you time and money. Easily discharged—Very efficient and the best mixer to be obtained for all classes of work.

All sizes in stock—Supplied with and without power.



F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

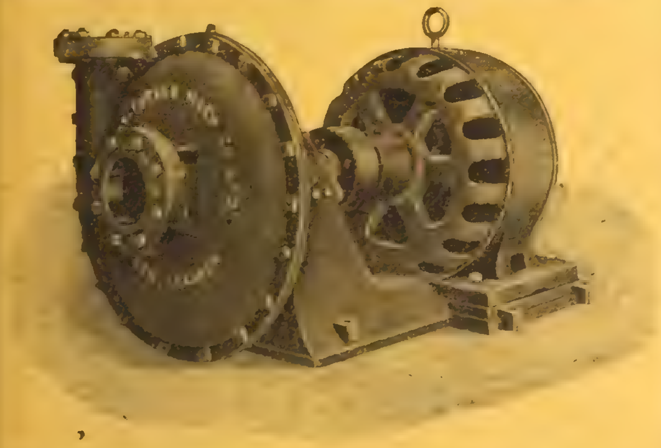
Vol. 24 Toronto, September 14, 1910 No. 37

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps, Condensers, Travelling Cranes, etc.



The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works : Don Speedway
Bending Works : 209-213 Victoria Street, TORONTO

SANDERSON'S

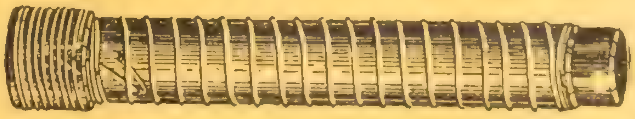
CAST STEEL

Canada Crown
Crucible Tool
Superior
Extra

Special
Double Special
Self Hardening
"Rex" High Speed

All Good Grades at Lowest Prices

A. C. Leslie & Co., Limited
Montreal
Canadian Sales Agents



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

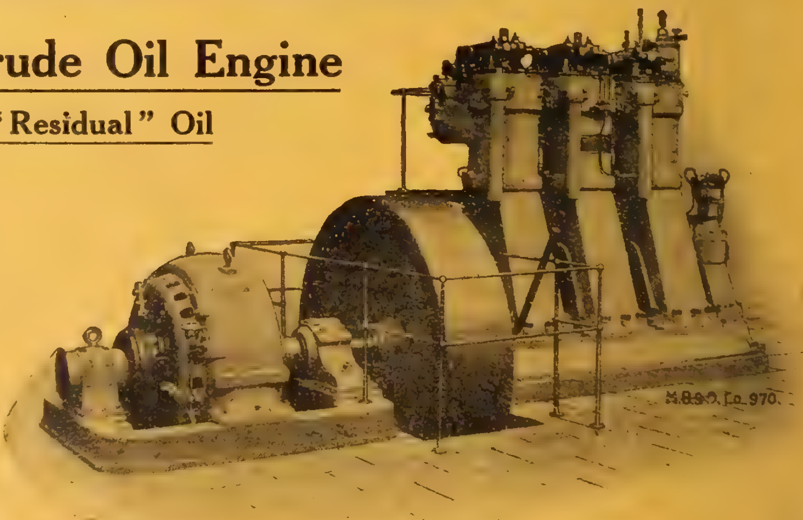
The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear	No Vapourizer
No Producer	No Boiler
No Chimney	Self Contained

- Continuous Running
- No Breaksdown
- Cheaper Buildings and Foundations
- Unskilled Labour only
- No Standby Losses

HIGH SPEED SLOW SPEED



35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work	Page
Canada Wire Goods Mfg. Co.	15
Dennis Wire & Iron Works	16

Belting	
Federal Engineering & Supplies, Ltd	51

Boilers	
Inglis, John	22
Jenckes Machine Co	2
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Mussens Limited	32
Taylor-Forbes Co	
Waterous Engine Works Co.	53

Brick	
American Enamelled Brick Co.	
Canadian Pressed Brick Co.	55
Don Valley Brick Works	7
Hamilton Pressed Brick Co.	10
Milton Pressed Brick Co	54
Port Credit Pressed Brick Co.	55
Toronto Pressed Brick Co.	34

Bridges (Steel)	
Canadian Bridge Co.	18
Cleveland Bridge Co.	18
Dickson Bridge Works	
Dominion Bridge Co.	18
Phoenix Bridge and Iron Works	19
Pennsylvania Steel Co.	18

Builders' Hardware	
Taylor-Forbes Co.	

Cement	
Alsen Portland Cement Co.	62
Britnell & Co	53
Bremner, Alex	59
Canada Cement Co	3
McNally & Co., W.	55
Morrison & Co., T. A.	60
Rogers, Alfred	4
Rogers Supply Co.	31
Sand and Supplies	55

Conduits	Page
Conduits Co., Limited	53

Concrete Mixers and Machinery	
Canada Foundry Co.	5
Cropp Concrete Machinery Co.	6
Goold, Shapley & Muir	9
Hopkins & Co., F. H.	64
Jenckes Machine Co.	2
London Concrete Machinery Co.	21
Mussens Limited	32
Morrison & Co., T. A.	60
Rogers Supply Co.	31

Concrete and Steel Reinforcements	
Ambursen Hydraulic Construct'n Co.	61
Beath & Son, W D	
Buffalo Steel Co.	
Canada Wire Goods Mfg. Co.	15
Hamilton Iron & Steel Co.	34
Trussed Concrete Steel Co.	63

Contractors' Plant	
Beatty & Sons, M.	15
Hepburn, John T.	17
H. & E. Lifting Jack Co.	19
Hopkins & Co., F. H.	64
Katie Foundry Co.	60
Marsh & Henthorn	51
Mussens Limited	32

Crushers (Stone and Rock)	
Hopkins & Co., F. H.	64
Jenckes Machine Co.	2
Mussens Limited	32
Morrison & Co., T. A.	60

Corrugated Iron	
Galt Art Metal Co.	20
Metallic Roofing Co.	51
Metal Shingle and Siding Co.	
Ormsby, A. B., Limited	5
Roofers Supply Co.	59

Contractors	Page
McIlwraith, Jas. A.	60

Drills	
Beatty & Sons, M	15
Canadian Rand Co.	1

Deafening Felts	
Cabot, Samuel, Inc.	55

Drilling Contractors	
Harvey, J.	61

Dredges	
Beatty & Sons, M	15

Engines	
Canadian Boving Co.	2
Inglis, John	24
Jenckes Machine Co.	2
Mussens Limited	32
Waterous Engine Works Co.	53

Excavators	
Harris, J. W.	11

Electrical Apparatus and Supplies	
Northern Electric & Mfg. Co.	

Engineers (Civil and Mechanical	
Barber & Young	60
Chipman & Power	60
Bowman & Connor	60
Davis & Johnston	60
Farmer, John T.	60
Fuce, Edw. O.	60
Galt Engineering Co., John	60
Glaubitz, H. J.	60
Hunt & Co., Robt. W.	55
Inglis, John	22
Lea & Ferguson	60
Mace, T. Harry	60
Mitchell, C. H.	60
McRae, John B.	60
Moore & Scollan	60
Nadel & Adler	60

Fire Apparatus	Pag
Morrison & Co., T. A.	60
Seagrave, W. E.	16

Fireproof Doors and Windows	
Douglas Bros.	14
Mussens Limited	32
Ormsby, A. B.	5

Granite and Marble	
Laurentian Granite Co.	60
Missisquoi Marble Co.	13
Rogers Supply Co.	31
Smith Marble & Construction Co.	17

Glass	
Chance Brothers & Co.	
Consolidated Plate Glass Co.	
Luxfer Prism Co.	
Thompson & Co., B. & S. H.	
Toronto Plate Glass Importing Co.	1

Heating Apparatus	
Jenckes Machine Co.	2
Leonard & Sons, E.	
Taylor-Forbes Co.	

Hoisting Machinery	
Beatty & Sons, M.	15
Inglis, John	22
Jenckes Machine Co.	2
Hopkins & Co., F. H.	64
Marsh & Henthorn	51
Mussens Limited	32
Scott Machine Co.	57

Hydrants	
Canada Iron Corporation	59
Gartshore-Thompson Pipe Co.	58
Kerr Engine Co.	8

Lime	
Christie, Henderson & Co.	17
Jamieson Lime Co.	19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

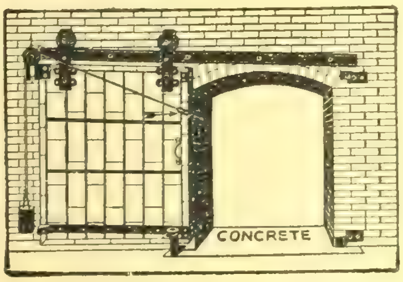
Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Do You Know Why We Label Our Fireproof Doors?

To protect your Client in two ways—To see that the maximum reduction in Insurance Rates is given—only **Labelled Doors** get this—others mean but a partial allowance—and to give really Fireproof goods—



Labelled doors are sure to prove themselves when struck by Fire. Let us quote you on them.

Manufactured by

A. B. ORMSBY, Limited
Experts in Fireproof windows and Doors
Factories - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

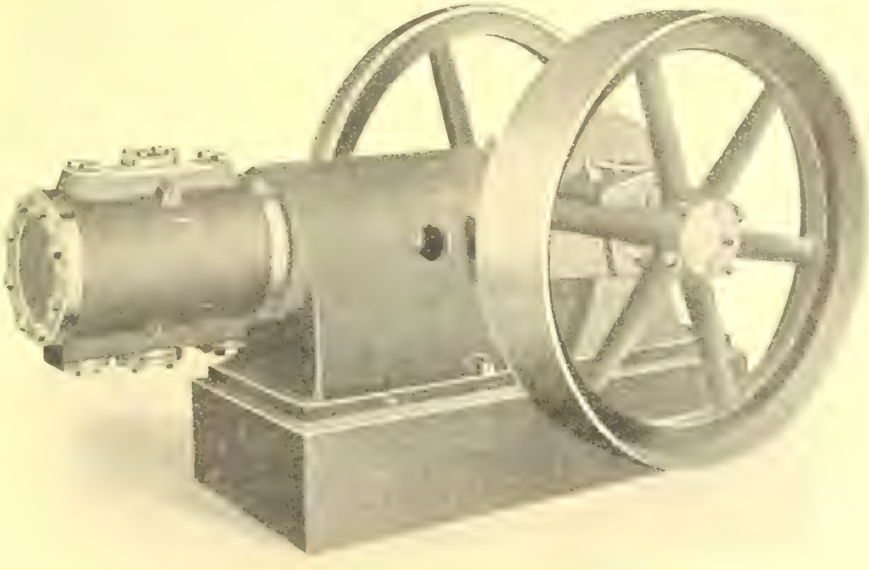
Hagersville Contracting Co.
Limited
Hagersville - Ont.

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



Canada Foundry Company, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

Lumber and Interior Finish

	Page
[illegible] Limited	10
[illegible] Lumber Co	
[illegible] Ltd	20
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	[illegible]
[illegible] & Co	
[illegible] Floor Co	62
[illegible] Bros	57
Woodstock Lumber Co	62

Metal Lath

Galt Art Metal	20
Metallic Roofing Co	51
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co	15

Paving and Paving Materials

Dominion Carbolineum Works	12
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario.	61

Plaster

Albert Mfg. Co.	
Britnell & Co	53

Pipe

Canadian Pipe Co	58
Dominion Wood Pipe Co	9
Gartshore-Thomson Pipe Co.	58
Municipal Construction Co	16
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co	
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery

Beatty & Sons, M	15
Goulds Pump Co	
Hopkins & Co., F. H.	64
Inglis Co., John	22
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	57
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	53

Roofing Materials

Barrett Mfg. Co.	
Brantford Roofing Co	11
Galt Art Metal Co.	20
Metallic Roofing Co.	51
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies

Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	58
Climax Road Machine Co.	58
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	53
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	31
Standard Drain Pipe Co.	56

Sand

Rogers Supply Co.	31
Sand & Supplies	55

Stone

	Page
Britnell & Co.	53
Christie, Henderson & Co.	17
Consolidated Stone Co.	20
Contractors' Supply Co.	59
Corinthian Stone Co.	15
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	15
Sand and Supplies	55

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	18
Hamilton Iron & Steel Co.	34
MacKinnon Holmes & Co.	19
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H.	19

Shovels (Steam)

Beatty & Sons, M.	15
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Safes and Vaults

Taylor, J & J	

Stone Cutters

Bailey-Underwood Co.	62

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co	

Tiles

Smith Marble & Construction Co.	17

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co.	2
Marsh & Henthorn	51
McDougall Caledonian Iron Works.	31
Ontario Wind Engine & Pump Co.	19

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	8
Standard Fitting & Valve Co	63

Ventilating System

Gardiner & Gaskill	54

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	

Wire Guards and Screens

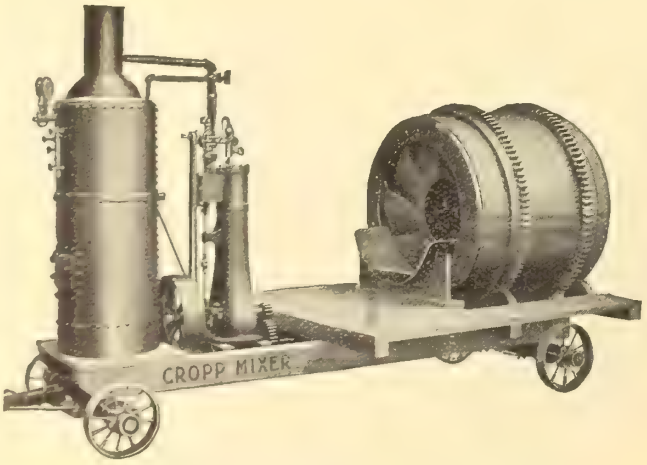
Canada Wire Goods Mfg. Co.	15

Water Wheels

Canadian Boving Co.	2

The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

The Goods with a Record

Don

Bricks

- Pressed Bricks
- Enamelled Bricks
- Vitrified Bricks
- Porous Terra Cotta Bricks
- Wire-Cut Bricks

Fireproofing

- Arches
- Blocks
- Column Covering
- Furring

Don Valley products have been the leading building material for many years. Their value is known.

Don

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Water Crane and Hydrant Combination

Webber Gate (Brass)

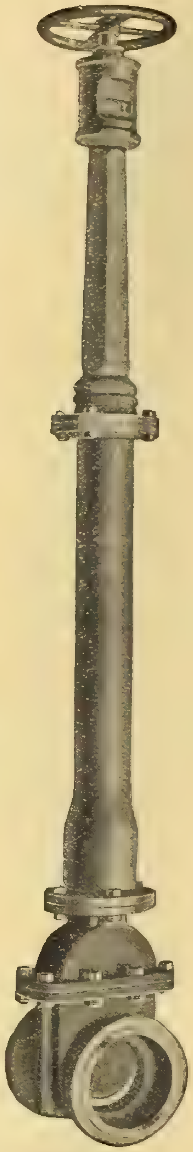
Hub End Gate

IRON

BODY

GATE

VALVES



Indicator Post for Fire Protection Valve

KERR

Our policy of careful manufacture for severe duty is maintained throughout our whole establishment and as a result our products are of the highest quality.

Every "Kerr" valve is accurately made and finished. They are perfectly tight when closed and have full area when open.

We have a complete catalogue

Have you a copy of it?

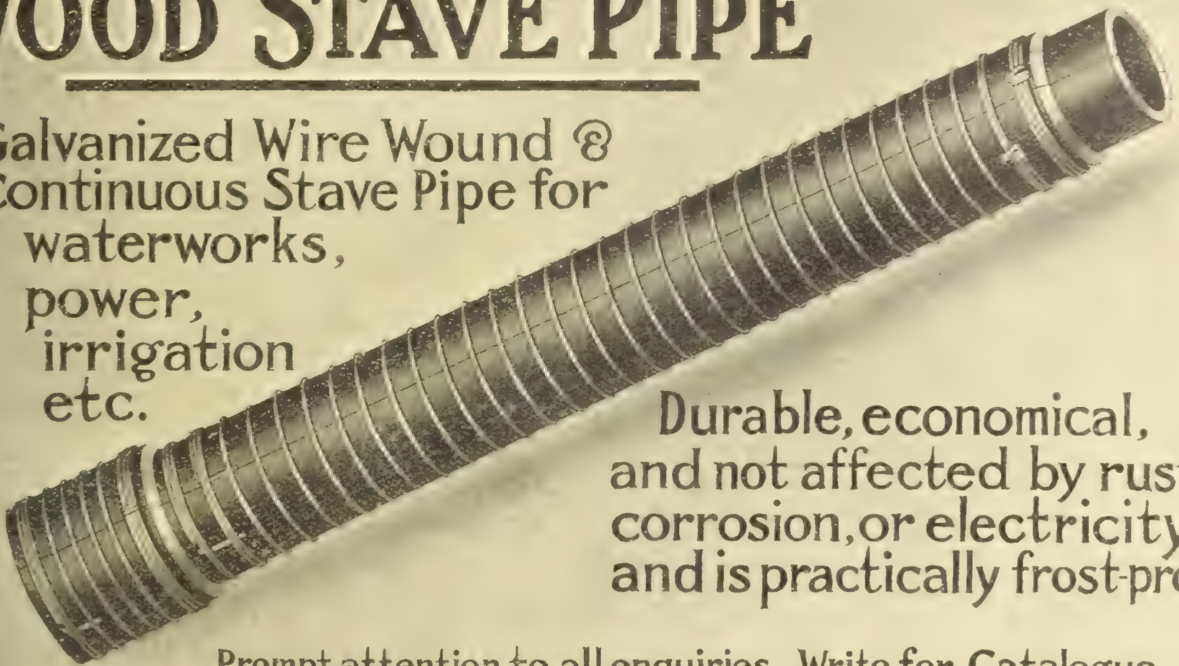
VALVES

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Compression Hydrant

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

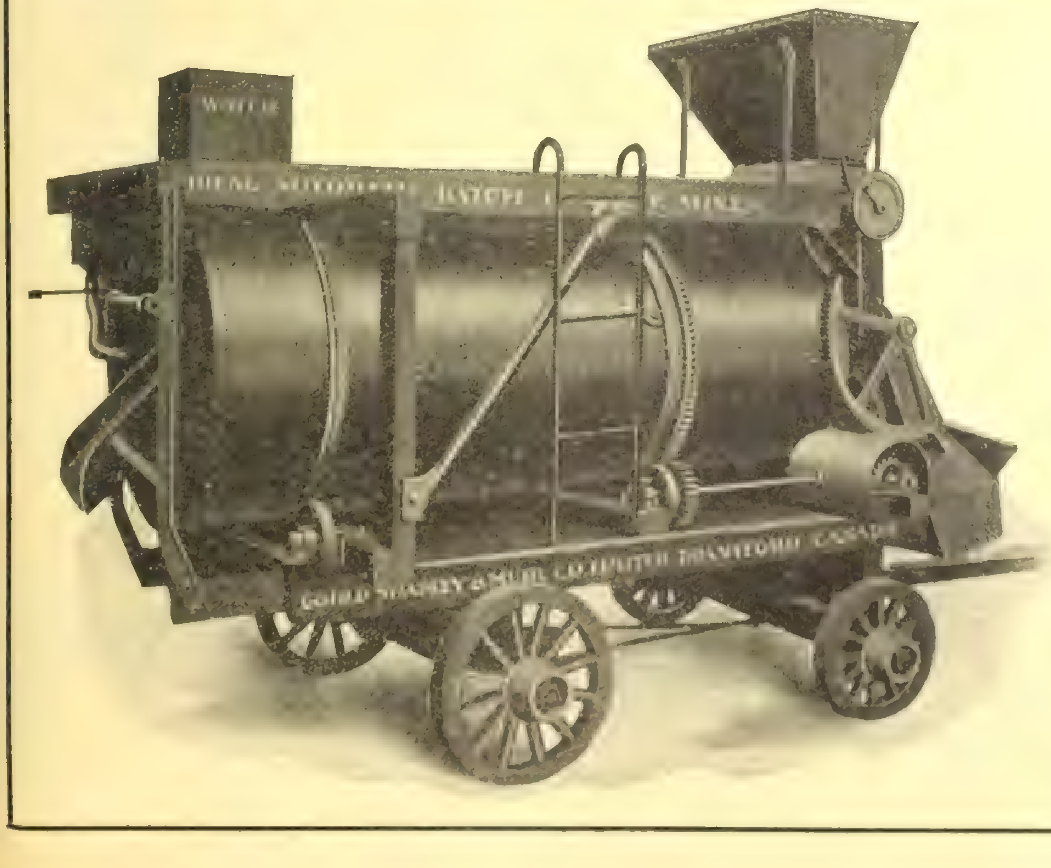


Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer



Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**

"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

Why Shingle a House when Brantford Roofing is better

Many builders and contractors, who have made a close study and inspection of the different classes of roofing materials on the market, recommend Brantford Roofing for use on dwelling houses as well as on factories and stores.

They do so, because Brantford Roofing makes a neat and attractive appearance on the roof;

Because Brantford Roofing makes a perfectly water tight roof;

Because Brantford Roofing will not melt in summer or turn brittle and crack in winter;

Because Brantford Roofing is fire-resistant;

Because Brantford Roofing is more than TWICE as durable as wooden shingles, yet costs no more.

Send for our big roofing booklet. It gives valuable facts about roofing materials.

Also ask us for samples of Brantford Roofing.

Brantford Roofing Company, Limited

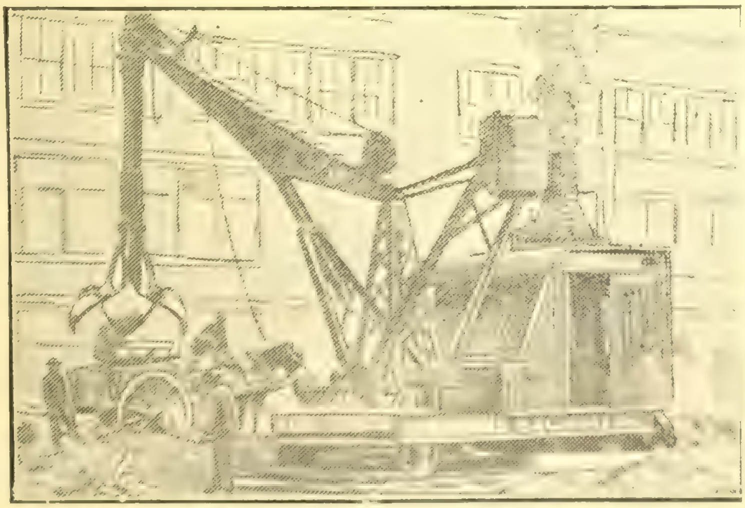
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

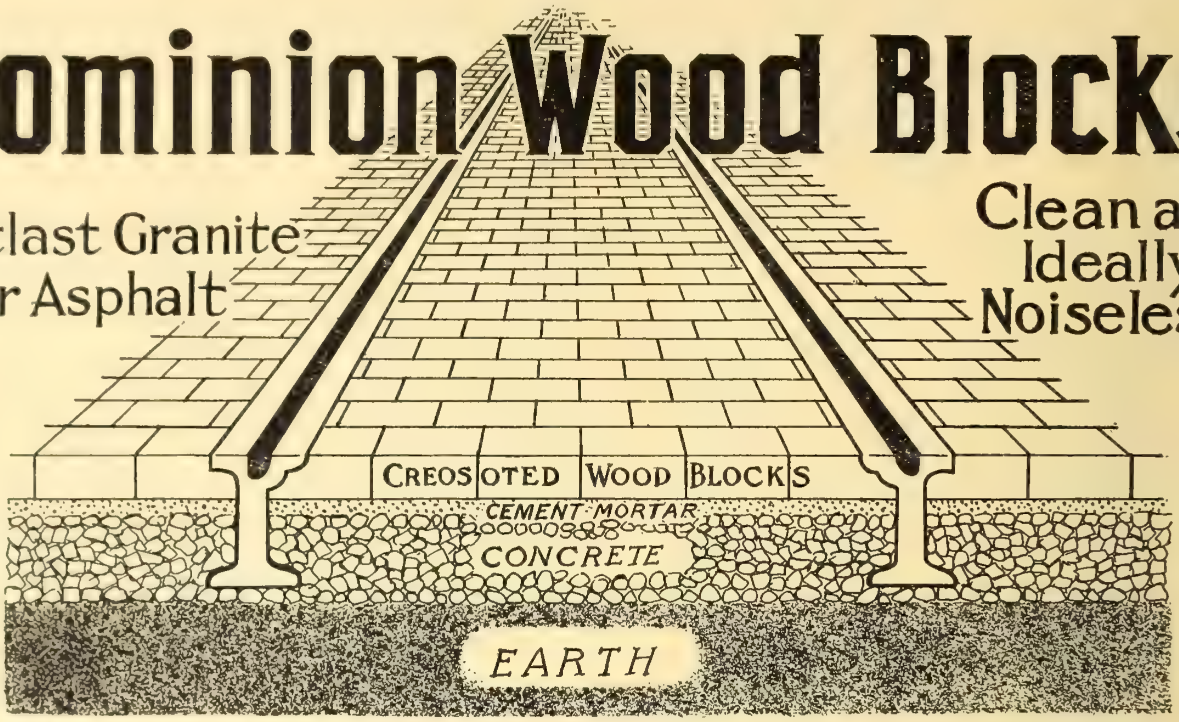
No Contractor should be without it.

For further information apply:

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks



Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless

Reasons Why

YOU should use Dominion Creosoted Wood Blocks for your city's or town's paving.

These blocks make a pavement that is not only cleaner, quieter and more sanitary than asphalt but is cheaper.

Dominion Wood Blocks are made in a mill specially designed for their particular manufacture. They are made from live Douglas Fir logs, the best material known for the purpose and our creosote is purchased under rigid specification.

A better pavement than Dominion Wood Blocks cannot be made.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

What More Do You Want?

than a high-grade marble with all the richness of color and lasting qualities of the imported product.

Quarried right here in our Dominion.

Missisquoi Marble

has been used as a building and finishing material for the past forty years. There is ample proof that its color is permanent and its strength everlasting.

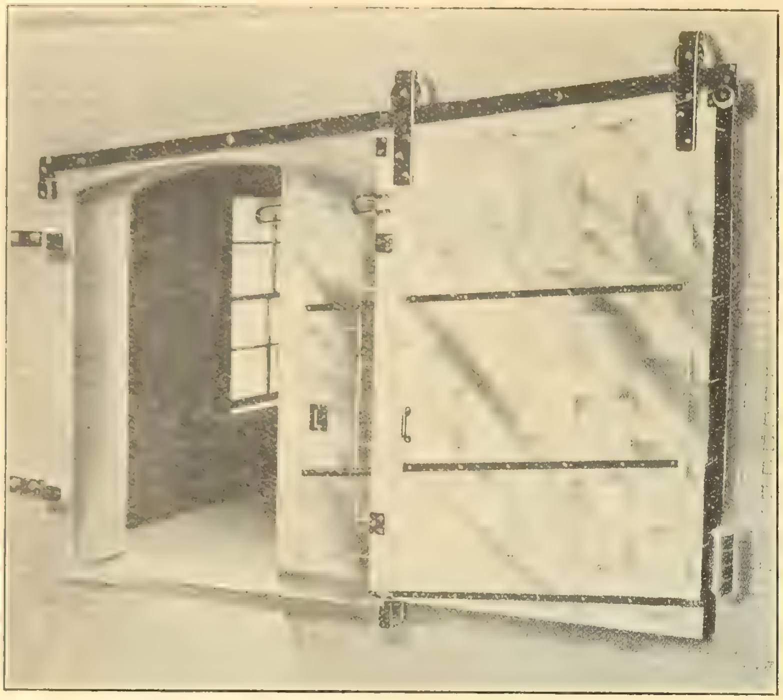
With our new equipment we can fill the largest order that can be transported.

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
Bosse & Banks, Quebec
Jas Robertson & Co., St. John, N. B.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver
General Contractors' Supply Co., Halifax
Also Branch Office, 85 Sparks St., Ottawa, Ont.



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

Sewer and Culvert Pipe

made of

FINE PLASTIC CLAY and WELL BURNED are about as DURABLE as the pyramids. They are the only class of pipe on which the ACIDS and GASES of SEWAGE HAS NO EFFECT. If you want a PERMANENT job and the kind of clay goods that are SURE TO PLEASE, write us for particulars.

Large Stock 4 inch to 24 inch, always on hand.

Telephone Toronto Connection, Parkdale 422.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

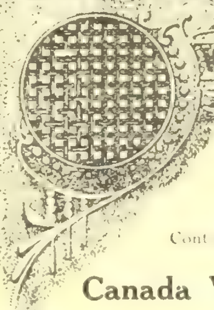
Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS



Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

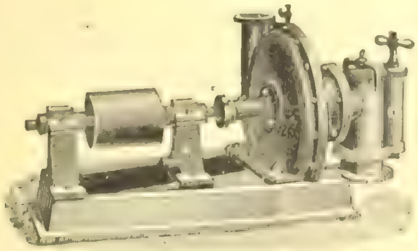
Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

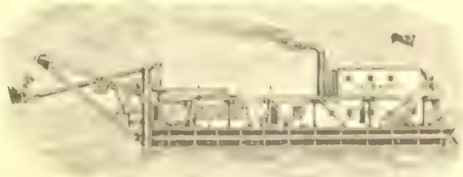
Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada
Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

DENNIS-LONDON ORNAMENTAL IRON

The **Dennis Wire & Iron Works Co.** Limited
London, Canada
Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

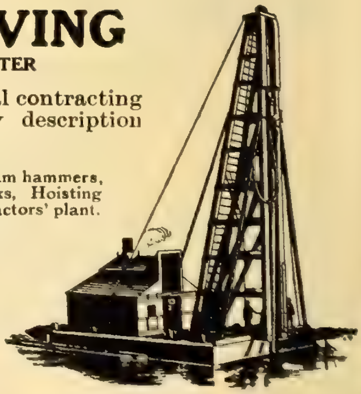
Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



The Calkins Tile & Mosaic Co., Limited

Wall Tiles, Hexagon Floor Tiles, Quarries, Ceramic Mosaic, Marble Mosaic

Interior Marble, Slate and Granite Work

The
Smith Marble & Construction Company, Limited
458 Bleury Street, Montreal

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced Concrete Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

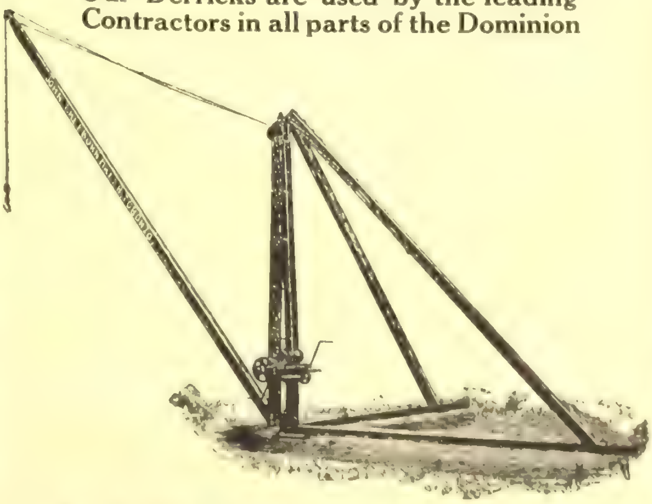
Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

Our Derricks are used by the leading Contractors in all parts of the Dominion



They are made in standard sizes from ½-ton upwards, have single and double purchase gears, band brake and an ample length of best quality wire rope.

From first to last they are made from the finest materials, by our own workmen, and in our own shops.

They may be operated either by hand or power, and effect a labour saving of fully fifty per cent. over the old style derrick.

JOHN T. HEPBURN
18-40 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

——Bridge and Construction Dep't.——

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.

Limited

Civil and Mechanical Engineers, Manufacturers, Contractors.

Head Office and Works:

Drummond Street - - SHERBROOKE, QUE.

The

Phœnix Bridge & Iron Works

MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P. 1040

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds

(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.

Limited

TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

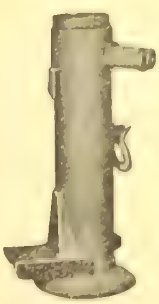
Jamieson Lime Company

Renfrew, Ont.

White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use



Made by practical Jack Builders. Material best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long stroke of the lever together with [illegible] construction of the jack makes it the [illegible] and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company

Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

"Lead and Steel Die Process"

"GALT"

Embossed Steel Ceilings

Artistically and practically a little ahead of anything else in this line being made in Canada.

The clean, sharp embossing that distinguishes "Galt" Ceilings and Walls is produced beween **Lead** and **Steel Die**, therefore—always uniform in depth, bold and clear-cut in appearance and free from cracks.

Machine-Cut Beads—another patented improvement. They make erection easier, 25% cheaper and a perfect job surer.

In art-work and mechanical production "Galt" Ceilings represent the latest developments in metal ceilings. Why be satisfied with old-fashioned stuff when the modern is here and costs less? Get our estimates on your work.

The Galt Art Metal Co., Limited
Galt, Ont.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

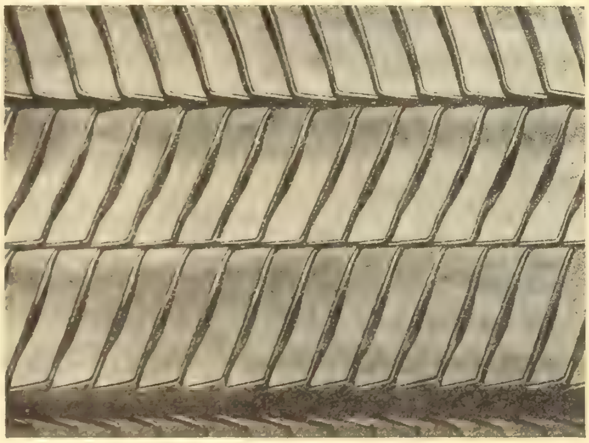
The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange



The Herringbone Ribs

are the secret of Herringbone success

Each rib is a miniature beam adding its part to the total of Herringbone stiffness. At the edge of the sheet the ribs are selvages, locking the adjacent sheets together without waste. From the front they are baffles, pushing the excess of plaster back on the trowel. At the back they are shelves, sustaining the clinch and preventing mortar from dropping.

CLARENCE W. NOBLE
GENERAL AGENT SALES
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

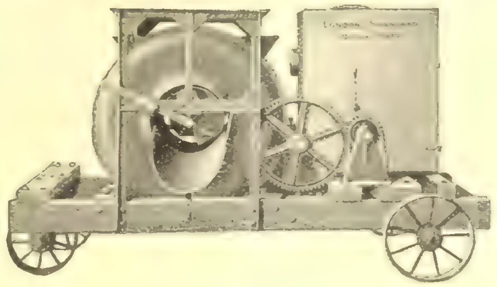
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Standard Drum Batch Concrete Mixer



The very latest ideas and improved plans of construction are embodied in this machine. CONTRACTORS it will be well worth your while to write for full particulars.

We Can Save You Money {
On the first cost of machine
Cost of maintenance
Cost of producing Concrete

This machine is manufactured in several sizes and with every equipment desired. Let us tell you all about it. State capacity required when writing. We also manufacture the now famous LONDON AUTOMATIC BATCH MIXERS No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full Line of Concrete Machinery.

The London Concrete Machinery Company

19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A. G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

Sash
Veneered Hardwood Doors
Pine Doors
Frames

Ceilings
Mouldings
Stairs
Pine and Hemlock

"Empire Brand"

Hardwood Flooring

We make a specialty of mixed cars of the above contractors' supplies which are made for those demanding perfectly manufactured goods.

Best facilities for prompt shipment.

J. R. Eaton & Sons

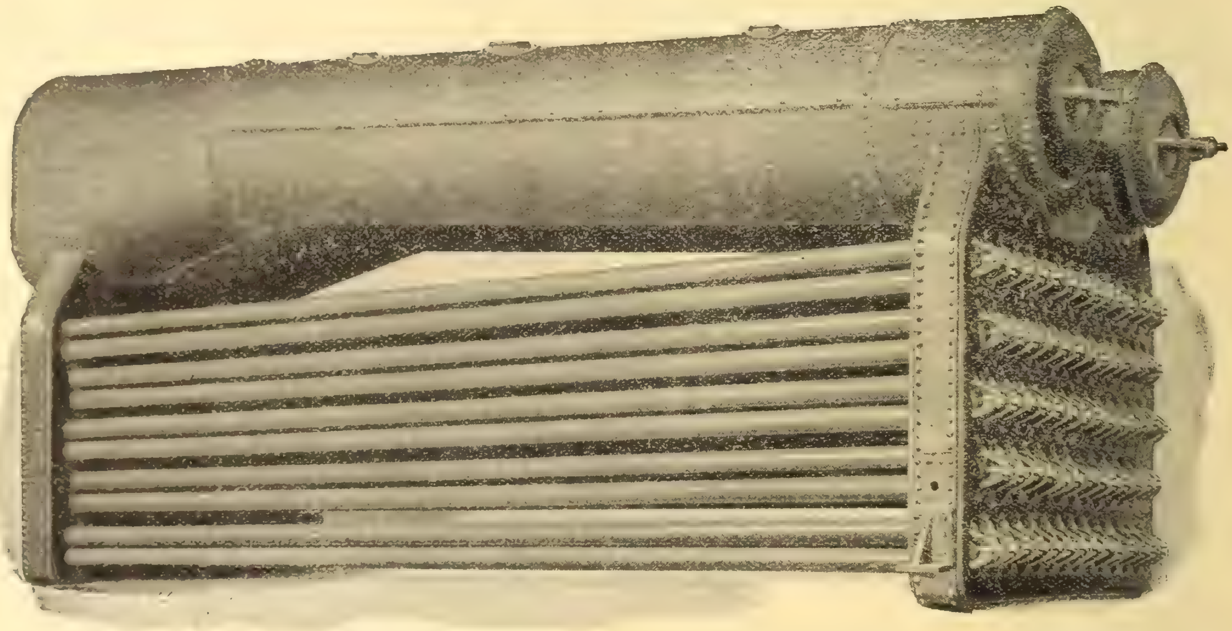
Orillia, Ontario

Montreal Agent: C. A. SPENCER, 55 St. Francois Xavier St.

Water Tube Boilers

that are

Economical



THE ERIE CITY WATER TUBE BOILER

Perfect combustion is the first step in the economical use of fuel; a glance at the above illustration will show you how carefully we have the heating surfaces arranged to secure that remarkable economy for which our water tube boilers are noted. We build these boilers for high pressure service in standard units from 100 to 500 H. P.

CATALOGUE UPON REQUEST

The John Inglis Company

Limited

ENGINEERS AND BOILERMAKERS

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Antigonish, N.S.

On September 17th tenders will be received for $25,000 30-year waterworks debentures. D. C. Chisholm, treasurer.

Chippewa, Ont.

On October 25th a bylaw will be voted on to issue $30,000, 30-year, 4½ per cent. waterworks debentures. Chas. Weinbrenner, clerk.

Chilliwack, B.C.

Tenders addressed to J. H. Ashwell, city clerk, will be received until October 1st for the purchase of the following 20-year debentures: Road machinery, $10,000; drainage, $10,000; interest at 5 per cent.

Halifax, N.S.

The Government of Nova Scotia invites tenders until September 15th for the construction of a public highway, leading around Big Pond, near the town of Sydney Mines. C. P. Chisholm, commissioner public works.

Hamilton, Ont.

Tenders will shortly be called for the construction of sewers on Main street between Garth and Locke streets. Estimated outlay, $5,000.

Humberstone Tp., Ont.

On September 28th the ratepayers will vote on a by-law to raise $2,500 to construct a road.

London, Ont.

Tenders addressed to J. A. Tancock, chairman No. 2 Committee, will be received until September 15th for tile sewers on Redan and Marmora streets. Plans, etc., in City Engineer's office. G. W. Wright, deputy city engineer.

Montreal, Que.

Tenders addressed to Board of Commissioners will be received until September 23 for designing, building and erecting at the Papineau avenue pumping station, one electrically driven, 6,000,000 imperial gallon turbine, or improved centrifugal pump, with direct connected motor complete. Specifications, etc., obtained from Superintendent, Waterworks, City Hall. L. N. Senecal, secretary.

Moose Jaw, Sask.

To build a dam on the Moose Jaw river which would raise the water 65 feet above its present level is projected. Three years would be spent on the undertaking, and when the construction work was finished the town would have a water supply which would be sufficient for a population of 100,000. Estimated cost, about $1,500,000.

Penticton, B.C.

Municipal Engineer Latimer has been asked to prepare a preliminary report upon the cost of installing water, light and power, on the completion of which by-laws will be prepared. An estimate of the resources of the three great reservoirs, now the property of the municipality in this connection, has just been made. It is stated that at Ellis creek reservoir, 240 horse power is available, sufficient to feed 1,200 sixteen candle power lights, while it will be possible to generate at least 300 horse power. Noted in issue of August 31st.

Regina, Sask.

Money by-laws, authorizing the issue of debentures totalling $196,000, to be distributed as follows, were carried: Pavements, $132,000; fire protection, $16,000; sewer, and waterworks extension, $20,000; sidewalks, $59,000. Total, $196,000.

Red Deer, Alta.

Tenders will be received until October 1 for $9,000, 30-year, 5 per cent. park; $5,500 30-year, 5 per cent. cement sidewalks; $4,000, 20-year, 5 per cent. purchase of pump; $500, 10-year, 5 per cent., new cell; $2,500, plank walk, 5-year, 5 per cent. purchase of hose debentures. A. T. Stephenson, secretary-treasurer.

St. John, N.B.

Time for receiving tenders for sewer and water main construction on Douglas avenue has been extended to September 20th.

St. Lambert, Que.

The construction of macadam roads and cement sidewalks throughout the town will be undertaken shortly.

Swift Curent, Sask.

Tenders are being called by G. W. Bilbrough, secretary-treasurer, until September 27th for contracts C, power house; contract D, settling tank and in-take; contract E, pumping machinery (compressed air system); contract F, electrical machinery; contract G, producer gas plant. J. Darlington Whitmore, engineer, Regina.

St. Andrews, N.B.

The C. P. R. has decided to spend about $100,000 in bringing water from Chamcook lake to St. Andrews. The water is intended, primarily, for the use of the Algonquin hotel, the artesian well system having proved a failure, but it is understood that the company hopes to make an arrangement with the town corporation to supply the town with water. The work is to be pushed forward with the quickest possible despatch, so that it may be ready for use next year. Engineer Lumsden is looking after it.

Tp. of McKillop, Ont.

Tenders for construction of Johnson drain will be received until September 20. M. Murdie, township clerk, Winthrop P.O.

Toronto, Ont.

The directors of the Toronto Industrial Exhibition have decided to pave all the main thoroughfares in the grounds before next year's show. Dr. Orr, manager.

An overflow sewer from Broadview avenue to the Don river to relieve the Langley avenue sewer, at a cost of $1,500, and a special sewer to relieve the Starr avenue sewer, at a cost of $500, were decided upon by the Board of Control as works that should be pushed forward at once.

Victoria, B.C.

See "Public Buildings."

Vancouver, B.C.

The city engineer presented a recommendation, based on the local improvement principle, covering the granitoid paving of Broadway, from Granville street to Bridge street. The estimated cost was $167,099, of which the city was to pay $87,296. In connection with the Broadway paving the city engineer said that a trunk sewer should be laid on the street before the pavement was laid, the cost being $42,000. Referred back to city engineer. The report of the city engineer on the tenders for sewer pipe recently submitted was presented. This stated that the aggregate of the tenders was as follows: Evans, Coleman & Evans, $19,315; Dominion Glazed Cement Pipe Company, $24,500; G. Gardiner Johnson & Company, $26,265.

Winnipeg, Man.

Tenders are called by Board of Control until September 15th for construction of granolithic walks, asphalt pavements, water mains. M. Peterson, secretary.

AWARDED.

Fernie, B.C.

The contract for extending the sanitary sewer system was awarded to J. J. Wood, $12,560.

London, Ont.

Contracts to the amount of $16,943 have been let by the Water Commisisoners for electrical equipment at Springbank pumping plant to the Canadian Westinghouse, Allis-Chalmers-Bullock, Seamans Brothers and John McDougall & Company.

Ottawa, Ont.

The Board of Control considered the following tenders for paving: Wellington street, Irving to Pinhey street (Hintonburg), Union Construction Company, $16,226; City Engineer, $15,947; Barber Asphalt Company, $15,660; Ottawa Construction Company, $15,586 (accepted). Melgund avenue — Union Construction Company, $4,618; Barber Company, $4,543; City Engineer, $4,526; Ottawa Construction Company, $4,895 (accepted). Little Ann street — Union Construction Company, $2,000; City Engineer, $1,963; Ottawa Construction Company, [illegible]; Barber Company, $1,900 (accepted). Flora street— City Engineer, [illegible]; Union Construction Company, [illegible]; Barber Company, $[illegible],670; Ottawa Construction Company, $20,560 (accepted).

Peterboro, Ont.

The Ontario Sewer Pipe Company will supply the vitrified pipe for the new sewerage system; Taylor & Hall, the reinforced concrete pipe. Contract awarded to [illegible] Conroy for sewers, storm drains and pumping station.

Quebec, Que.

The following tenders for supply of about [illegible] feet of curb stone, cement or asphalt sidewalks for this municipality were received: Blais & Frères, Quebec, [illegible] cents a foot for cement work, and [illegible] paving for stone work: Canadian Hassam Paving Company, Montreal, 98 cents; Mr. [illegible], Quebec, $1.00 (accepted); Reid Craig & Company, Quebec, $1.05 (accepted). For cement sidewalks, Mr. Glode, $[illegible], Hassam Company, $2.33; Reid & Company, $2.39. For asphalt sidewalk, Glode, $4.00; Hassam Company, $2.85 and $3.26. Only one tender, that of the Sicily Asphaltum Company for the paving of Caron street, opposite Jacques Cartier Church, in asphalt, was received, the price being $3.54 per square yard, and on motion of Ald. [illegible], that firm was awarded the contract.

Rainy River, Ont.

The contract for installing sewer system and disposal plant has been awarded to the National Paving & Contracting Company, Limited, of Winnipeg, at $18,239. J. H. Wilson, city clerk.

St. John, N.B.

The tender of the Caritte-Patterson Manufacturing Company for the Germain street paving was accepted at $12,545. City engineer, Murdoch.

Swift Current, Sask.

Tenders for laying sewers and water mains were received as follows: M. A. Pigott, & Son, Kenora, Ont., $49,739; S. E. McManus & Son, North Battleford, Sask., $87,457.50; Broley & Martin, Fernie, B.C., $71,535.13; H. G. McVean, Moose Jaw, Sask., $62,673; W. I. Gray & Company, Winnipeg, $59,000; Laidlaw & MacDonald, Fort William, $39,179.85 (accepted). Tenders for constructing sewage disposal works as follows: M. A. Pigott & Son, $11,801; Broley & Martin, $11,137.95; Laidlaw and MacDonald, $8,299 (accepted). G. Marriott, engineer of construction. Two contracts yet to be awarded. J. Darlington Whitmore, Regina, consulting engineer.

Vancouver, B.C.

The contract for paving Second avenue was awarded to Hassam Paving Company. Other tenders awarded were to the Warren Bitulithic Company for paving Tenth avenue from Granville to Laurel, and Palmer Bros. & Henning for block-paving on Fourth avenue, from Maple to Cedar. The tender of M. P. Cotton for laying cement walks at 15 cents per square foot was rejected. The council awarded the contract for the First avenue paving to the Independent Company and instructed the solicitor to move promptly in connection with the Hastings street repairs.

Railroads, Bridges and Wharves

Calgary, Alta.

See "Power Plants."

Edmonton, Alta.

Premier Sifton has signed the plans for the first 100 miles of the line to cross the whole province from the international boundary to Peace river, distance of over 700 miles. The company will be known as the Pincher Creek, Cardston & Montana Railway. Connections will be made with the C. P. R. at Pincher Creek and with the Hill lines in Montana. Application will be made next session for an extension of the charter.

Goderich, Ont.

Tenders are being called by Department of Public Works until October 4th for construction of breakwater here. Plans, etc., at office of J. G. Sing, district engineer, Toronto; J. L. Michaud, district engineer, Montreal, and on application to local postmaster.

Hamilton, Ont.

The tenders for the building of the revetment wall at Burlington Beach were much higher than anticipated, the tender of Jaseph Battle, Thorold, being the lowest. His figure was $22,412, and the beach commissioner's estimate of the cost of the work was $17,000 or $18,000. The building of the wall may be delayed temporarily, owing to the high cost, but it will eventually be built.

Lakeport, Ont.

Tenders are being called by Department of Public Works until October 4th for reconstruction of wharf here. Plans, etc., at office of J. G. Sing, distributing engineer, Toronto, and on application to the local postmaster. R. C. Desrochers, secretary.

London, Ont.

See "Business Buildings."

Tenders are called for diverting waters of Medway river and erecting concrete breakwater at the Hugabone bridge. Plans and specifications at the county engineer's office. S. F .Glass, Reeve.

Levis, Que.

Plans for the dry dock here are ready to submit to tne government. The following firms are comprised in the Dominion Drydock Company, the Canadian Pacific Line, the White Star Line, the Allan Steamship Company, Harland & Wolff, of Belfast, and Davie Bros., of Quebec, under the bonus system provided in the subsidy act of last May Sir R. Perks, representative.

New Mills, N.B.

Tenders are being called by the Public Works Department until October 3rd for the construction of wharf here. Plans, etc., with district engineers at St. John, Chatham, and on application to local postmaster.

North Vancouver, B.C.

It is stated that tenders will shortly be invited from several bridge firms in America, England, France and Canada for the bridge over Second Narrows. Reeve McNaught is interested. Noted previously.

Orillia, Ont.

The Township of Orillia reeve and Councillor Joyce have been appointed as committee to call for tenders for Marchmont steel bridge; cement work to be done by day labor. C. E. Rose, township clerk.

Quebec, Que.

Mr. D'Abbadie, chief engineer, for M. P. and J. T. Davis, contractors, is the authority for the statement that the construction of the bridge here will not be seriously delayed by the accident to the caisson.

Saskatoon, Sask.

The route by which connection will be made between the G. T. P. and the Hudson Bay Railway has been decided upon. A G. T. P. branch line will be run from here through Melfort, and connect with the Hudson Bay Railway at Pas Mission.

Tofield, Alta.

See "Business Buildings."

Township of Elgin, Ont.

On November 15 a by-law will be taken into consideration by the county council to issue $10,000 bridge debentures. K. W. McKay.

Vancouver, B.C.

The G. T. P. Railway has abandoned the idea of calling for tenders this fall for the building of the 500-mile section, representing that portion of the road between Aldermere in the Bulkeley Valley and Tete Juane Cache, not under contract. Scarcity of labor is given as the cause for this decision. Unless conditions radically improve there is no possibility of the company carrying out the terms of its statutory agreement with the Dominion Government requiring the completion of the line by 1911.

AWARDED.

Aylmer, Que.

Mr. A. Laflamme, of Montreal, has obtained the contract for the building of the new government wharf here. It will cost in the neighborhood of $12,000.

Belleville, Ont.

The section of the C. N. R. from Trenton to Belleville has been sub-let as follows: J. Stewart, two miles; Murray & McDonald, five miles; McGinnes, three miles.

Guelph, Ont.

H. E. Croft was awarded the contract for the concrete bridge over Presant's Mill raceway.

Public Buildings, Churches, Schools, etc.

Belleville, Ont.

The Board of Education decided to expropriate the Lingham property which is required for the school site and to consult with Messrs. Ellis & Connery, architects, Toronto, as to plans.

Tenders will be received at the Y. M. C. A. until September 17th for the excavating by the yard of Y. M. C. A. building site, Campbell street; also the excavating and laying of a sewer from above site to main street. Specifications may be seen at the Y. M. C. A. rooms.

Crossfield, Alta.

Tenders were called until September 15th for erection of stone and brick school for district No. 752. Plans, etc., with G. H. Murrin, architect, this place.

Chippewa, Ont.

A petition is in circulation asking the government to aid in the establishment of a lighthouse on Hog Island, at the mouth of the Welland river (Chippewa creek), in the Niagara river.

Calgary, Alta.

A by-law authorizing a grant of $150,000 from the city toward a university, is being prepared.

Chilliwack, B.C.

Tenders addressed to J. H. Ashwell, city clerk, will be received until October 1st for $15,000 municipal hall debentures.

The plans submitted by Mr. Thos. Hooper, architect, Vancouver, for the new city hall have been approved.

Tenders addressed to J. A. Ashwell, city clerk, will be received until September 24 for erection of city hall building. Plans, etc., at office of the above; at office of city clerk, New Westminster, and at office of the architect, Thos. Hooper, 526 Winch Building, Vancouver.

Gilbert Plains, Man.

On September 20th the ratepayers will vote on a by-law to issue $10,000 6 per. cent., 20-year school debentures. J. C. Turner, secretary-treasurer.

Halifax, N.S.

Tenders were called until September 14 for erection of brick building to be used as power house for Victoria General Hospital.

Howe Sound, B.C.

Tenders are being called until September 26th by Public Works Department, Victoria, for erection of 2-room school here. Plans, etc., at above Department; at office of Jas. Fletcher, Gibson's Landing; the provincial timber inspector, Vancouver.

Hamilton, Ont.

A special committee was appointed by city council to confer as to site for Children's Shelter.

Koksilah, B.C.

Tenders are being called by Public Works Department until September 20th for erection of a one-room school.

London, Ont.

Plans prepared by City Architect Nutter for new school to replace Colborne Street school have been accepted and tenders will be called shortly.

Levis, Que.

The eastern wing of the Hospice de St. Joseph de la Deliverance was damaged by fire to the extent of about $20,000 on the 1st inst.

Montreal, Que.

Mr. Alphonse Contant, architect, 17 Plyace d'Armes Hill, has prepared plans and specifications for the erection of St. Philomene School in Rosemount for the Catholic School Commissioners.

Megantic, Que.

Tenders are being called until September 27th by Public Works Department for construction of public building here. Plans, etc., at office of H. N. Lymourner, Superintendent of Dominion Buildings, Post Office, Montreal; at local past office and at the above Department. R. C. Desrochers, secretary.

North Toronto, Ont.

The Eglinton Young Men's Own Club have completed final arrangements for their proposed gymnasium and reading room here.

New Westminster, B.C.

Tenders have been called until September 12th for erection of church on Sixth Avenue. Plans, etc., at office of Thomas Hooper, architect, Winch Block. J. W. Macdonald, secretary.

Tenders addressed to the Minister of Public Works will be received until September 26th for the erection of additions to Court House. Plans, etc., at offices of the Government Agent, this city; Provincial Timber Inspector, Vancouver; and at the Department of Public Works, Victoria. F. C. Gamble, public works engineer.

Ottawa, Ont.

Building Superintendent Garvock, of the public schools, announced that the new school at Ottawa South will be ready for opening on January 1st.

It is reported that the Public Works Department will call for tenders at the end of the year for erection of new departmental block. Plans are being revised.

Pembroke, Ont.

Notice was given by Mr. Bromley of his intention to introduce a by-law to borrow $2,500 for library site.

Rock Bay, B.C.

Queen's Hospital of the Columbia Coast Mission here was totally destroyed by fire on the 3rd inst. Estimated loss, $10,000. The hospital was the property of the Hastings Mill.

St. Catharines, Ont.

The Public School Board have decided to call for competitive plans for a new school on the ground recently purchased on Niagara street.

Summerside, P.E.I.

Tenders are being called by Public Works Department, Ottawa, for construction of armory here. Plans, etc., on application to Mr. A. McSween, Post Office Building, this place, and at office of J. H. Hegan, resident engineer, Charlottetown, and at above Department. R. C. Desrochers, secretary.

South Vancouver, B.C.

Tenders were called until September 8th for the following: Erection of brick and stone building at Ontario street; erection of wood frame school at Wilson and Victoria; erection of brick and stone school at Wilson and Victoria roads. W. Ferris, secretary; J. H. Bowman, architect, 112 Crown Building, Pender street, Vancouver.

Strathcona, Alta.

Tenders addressed to John Stocks, Deputy Minitser of Public Works, Edmonton, will be received until September 20th for plumbing, steaming, electric wiring for the Dormitory Building; also interior hardware for certain public buildings. Plans, etc., on application at engineer's office, Department of Public Works, or at Branch Department, Calgary.

St. John, N.B.

Hon. Wm. Pugsley is authority for the statement that specifications for the drill hall were being drawn up and that tenders would be called for within a few weeks. The site has been chosen.

Toronto, Ont.

Permit was granted to Board of Education for a 2-storey school on Ashdale avenue, $36,590.

Tenders addressed to the Chairman of Building Committee, will be received until September 17th for the various trades required in the erection of buildings for the Medical Wing and Administration Building in connection with General Hospital. Darling & Pearson, architects. See advertisement in this issue.

It is understood that an offer will be made shortly to the governors of University of Toronto by the Department of Militia and Defence for the purchase of a piece of the University College grounds for an armory site. Sir Frederick Borden, Minister of Militia and Defence.

Tenders for the work on the new school building to be erected on Manning avenue were recommended to the Board for acceptance as follows: Mason work, Chalkley & Sons, $22,397; carpentering, Frank Armstrong, $4,770; roofing, Regan and Spence, $745; plastering, T. Blackburn & Son, $2,500; painting, J. Phinnemore, $95; plumbing, Fred Armstrong Company, $575; structural steel, W. H. Salter, $2,800; heating, J. R. Seager, $5,450; heat regulating, Johnston Temperature Regulating Company, $825; electric wiring, Fred Armstrong, $60; total, $40,217. The contract for the planking at the Parkdale School was recommended to be given to Frank Armstrong at $2,431.

Victoria, B.C.

It has been decided by the provincial government to raise the status of the Queen Charlotte school district, and a new school will be built as soon as the local board provides the site.

The following by-laws were carried: Spring Ridge high school site, school loan by-law, $60,000; Dallas road foreshore protection by-law $75,000; Isolation hospital, $35,000; public convenience by-law, $20,000; sewer loan by-law, $50,000. That for the placing of telephone wires underground was defeated. Total amount, $275,000.

Preliminary plans for the new theatre, proposed by the Northwest Theatrical Association of which Mr. Cort, Seattle, Wash., is general manager, have been prepared by the association's architect, Mr. E. W. Houghton. Messrs. Simon Leiser, R. Hall and C. W. Rhodes are named as provisional trustees. Estimated outlay on building and equipment, about $80,000.

Vancouver, B.C.

At a recent meeting of the Women's Auxiliary of Westminster Hall, the proposal was made to erect a thoroughly modern young ladies' college. The project has been referred for consideration to the different Presbyterian congregations of this city, represented by the auxiliary, and it is fully established that they will announce in favor of building such an institution.

Welland, Ont.

The estimated cost of the proposed rink, mentioned in last week's issue, is $6,000. As yet the proposition is not far enough advanced to give news for publication. For further particulars apply to Mr. H. E. Cooke, Welland. F. S. Port, architect.

Warren, Man.

Tenders addressed to M. S. Peacock, secretary-treasurer School Board, Hanlan, will be received until September 23rd for erection of school here.

Winnipeg, Man.

Tenders closed recently for the North Winnipeg building for the Y. M. C. A. The architect, J. H. G. Russell, states that half a dozen tenders for the work were opened. The contract will be awarded within a few days.

The city will shortly call for tenders for the construction of a public bath. The rough plans are now being drafted. The bath is not to cost more than $50,000.

P. C. Samwell has completed plans for a sanatarium to be built in Elmwood at a cost of about $40,000. It is to be three storeys in height and will have accommodation for about thirty patients. Dr. A. D. Carscallen is identified intimately with the project, which is the first of its kind to be noted in Winnipeg.

AWARDED.

Cornwall, Ont.

The members of the Cornwall Club have decided to erect a building for their own use on their property west of the Public Library on Second street. It is to be a substantial two-storey brick building with all the modern appointments for a club house. Atchison & Company have the contract. Work was commenced on the foundation last week.

Hatzic, B.C.

The contract for the erection of a new public school was awarded to Thos. Turnbull, Victoria.

Meaford, Ont.

The contract for improvements to school building were awarded as follows: Cleland Bros., heating and ventilating; D. B. Brown, plumbing; Jesse Sparling, excavating, masonry and carpenter work. Probable expenditure, $[illegible]

Montreal, Que.

Ward & [illegible], 608 [illegible] street, have the general contract for the Library building on [illegible] street for the Protestant School Commissioners. Architect, A. F. Dunlop, Lindsay Building.

The contract for the steel work in the Central Y. M. C. A. building has been awarded to the Structural Steel Company; that for brickwork and masonry, to John Stewart & Company. Foundations having already been prepared, work will start at once. It is expected that contracts for the building at Westmount will be awarded shortly.

North Vancouver, B.C.

The contract for the erection of the new North Star school at North Vancouver has been awarded to Mr. F. P. Rogers, Victoria.

Toronto, Ont.

The Finance Committee of the Board of Education has withdrawn the contract for heating, ventilating and plumbing which had been awarded to J. R. Seager for $5,450, and has given the heating to Keith & Fitzsimons for $5,495, and that for the plumbing to Fred Armstrong Company for $775.

Winnipeg, Man.

The contracts for plumbing, heating and ventilation of the two new technical high schools were awarded as follows: St. John's school, Standard Plumbing & Heating Company, at $35,650; South End school, Cotter Bros., $35,497.

Duncan & Macdonald, 562 Balmoral street, this city, were awarded the contract for erection of Olivet Baptist Church. Architect, Geo. G. Teeter, 604 Builders' Exchange.

Residences

Edmonton, Alta.

Buildings, for which permits have just been issued include one for a dwelling for Dr. G. H. Malcolmson, east side of Seventh street, $6,400, McSporran, contractor; three dwellings on the west side of Tenth street for Armstrong Bros, by Dewar & Conover; dwelling on east side of Syndicate for C. Querengesser, $2,100.

Fort William, Ont.

Tenders will be received until September 16th for erection of a residence. Plans with Hood & Scott, architects.

London, Ont.

W. H. Hayman, this city, is the architect for the 4-storey apartment house, corner of Queen's avenue and Wellington, of which the owner is John Hayman & Sons. Materials, red pressed brick and cut stone; estimated cost, $35,000.

Ottawa, Ont.

Among the building permits taken out recently were: Omer C. Lyon, dwelling, Lisgar street, $4,500; A. E. Shaver, dwelling, Powell avenue, $6,000; David Cuthbertson, Turner street, dwelling, $3,800; D. L. Campbell, apartments, Preston street, $4,000.

South Vancouver, B.C.

Broadhurst & Witaker, real estate firm, will have constructed on the Angus road at Mills street an apartment house, 116 x 132, three storeys in height. A. J. Bird, architect.

Toronto, Ont.

Permit was granted to A. G. Saunders for 1 pair semi-detached, 2-storey brick dwellings, near Ossington, on Manchester, $16,000.

Vancouver, B.C.

Permits were issued to Dr. D. H. Wilson for a dwelling to cost $31,000; another to W. J. Harrington for a $13,000 home on Alder street, Fairview.

Mr. Ward, of the Prudential Builders', Limited, has informed Building Inspector Jarrett that his concern expected entering upon an extensive building programme in West Fairview. The tract purchased by them from the C. P. R. contains 105 lots and they intend to erect seventy-five residences on the property, each to cost from $3,500 to $5,000. The concern will have fifty buildings erected by next spring.

AWARDED.

Ottawa, Ont.

P. W. G. Adamson has been awarded the carpentering contract for Admiral Kingsmill's residence at Rockcliffe. Jas. Mather is architect. H. Robilliard will furnish the limestone, on which this dwelling will be constructed.

Strathcona, Alta.

D. Grant & Company, Edmonton, are the contractors for the residence being erected for Mr. J. W. Tipton on First avenue south. Cost, $4,500. Architects, Wilson & Herald.

Business Buildings and Industrial Plants

Burnaby, B.C.

Mr. O. S. Wakeling has charge of the construction of the new plant being established by the Sumner Iron Works of Everett, Wash. The site for buildings will occupy about 10 acres. The foundry, boiler shop and three erecting shops will be built in the order named.

Beauport, Que.

The town council has voted a loan of $20,000 to the promoters of the Canadian Silk & Cotton Company, who are to erect a factory to employ 250 hands.

Brantford, Ont.

Tenders will be received by Taylor & Taylor, architects, Brantford, Ont., up to September 20th for the various trades required in the erection of a bank and office building for the Imperial Bank of Canada. See advertisement in "Tenders and For Sale Department" of this issue.

Calgary, Alta.

Permit was issued to A. A. Dick for hotel, Ninth avenue, $140,000.

Comber, Ont.

The lumber and stave mills of J. S. Ainslie & Bros. was destroyed by fire on the 11th inst. Estimated loss, over $6,000.

Compton, Que.

The Oriental Hotel, owned by E. S. Squire, with three other buildings, were destroyed by fire on the 9th inst. Estimated total loss, $60,000.

Eastview, Ont.

R. W. R. Cummings is erecting an elevator and feed mill in Eastview. It will be entirely of reinforced concrete and the elevator will have a capacity of 15,000 bushels. It will cost about $12,000. Fred Kuntz, of A. E. Baxter Company, Buffalo, will superintend the work.

Fredericton, N.B.

The John Palmer Manufacturing Company is to be reorganized and capital increased. In return for civic privileges, the company will build a new modern factory. R. W. McLean, solicitor.

Hamilton, Ont.

The Oliver Chilled Plough Works have taken out another permit for a factory building. The building will be of brick, steel and concrete and will cost $45,000.

Kingston, Ont.

It is stated that the Hawthorne Silver & Iron Mines has acquired about 20,000 acres in this vicinity. This will, in all probability necessitate the erection of large plants for the manufacture of pig iron later.

Kenora, Ont.

Murphy's hotel and the residences of M. Nelson and Dr. Beatty were destroyed by fire on the 6th inst. Total estimated loss, $6,000.

Leduc, Alta.

The sheds and machinery rooms of the Telford Lumber Mills here were gutted by fire on the 8th inst; loss, $3,000. J. M. Telford, M.P., is the owner.

London, Ont.

The plans for the C. P. R. improvements in this city show that the company will build a larger new station at Quebec street, a new roundhouse, capable of accommodating 26 of the largest-sized engines, machine shops, and office buildings, and very extensive improvements to the yard. It is not unlikely that the work will be rushed through this fall.

Moncton, N.B.

The Massey-Harris Company will erect a new warehouse to replace the one torn down.

Maisonneuve, Que.

The Bell Telephone Company will erect a branch exchange building here. Plans, specifications and all information to be obtained from the architect, Mr. J. W. Carmichael, Bell Telephone Building, Montreal.

Milestone, Sask.

A temperance hotel is to oe started here. - joint stock company has been fromed and arrangements are being made for immediate construction.

Midland, Ont.

The cast-house of the Midland Engine Works Company was damaged by fire to the extent of $12,000 on the 8th inst.

Mission City, B.C.

The Fraser Valley Sugar Works, Limited, New Westminster, incorporated at $300,000, will, it is stated, construct an extensive plant here.

Montreal, Que.

It is reported that a new building of 10 storeys will be erected, possibly not before the spring, on the site occupied by the Oak Hall restaurant, corner Notre Dame and St. Peter street. The property belonged to the Carsley Company.

North Vancouver, B.C.

The Bank of Hamilton has completed plans for its new building on Lonsdale and First street. The structure will be massive and ornate and will consist of three storeys. It is expected that work will be proceeded with very soon.

New Westminster, B.C.

The decision of the city council to tear down all the old rookeries in the heart of the city has had a good effect and already many large buildings are talked of. It has been tentatively announced that the Kelly-Douglas Company, of Vancouver, is to erect a large wholesale house in the city for the supplying of the Fraser Valley trade.

Penticton, Sasr.

An important industry will be established here this fall if a site on the waterfront can be secured from the council. A syndicate of local men and outside capitalists proposes to secure 250 feet of waterfrontage on the Esplanade and to construct a brick kiln with extensive yards, as the cliffs in the immediate vicinity are said to afford ideal clay for brick manufacture.

Prince Rupert, B.C.

Sir Wilfrid Laurier is quoted as saying that the government will build a grain elevator here.

Perth, Ont.

Winn Bros., shoe manufacturers, will locate their factory here, in which local capital is invested. The site has not yet been secured. Estimated total outlay, $60,000. Mayor Hall, Col. Balderson and Mr. J. H. Mendels, provisional directors.

Port Arthur, Ont.

The ratepayers ratified an agreement with Robert Greig, of Toronto, whereby he will establish here a branch of a New York enamel works, to employ not less than 200 men. By-laws for building car barns, building swimming pools were carried also.

Princeton, Ont.

The Bank of Hamilton, owned by Mr. Thos. Starr, was destroyed by fire on the 8th inst. Estimated loss, $2,500.

Regina, Sask.

Tenders are being called for erection of brick warehouse here, two storeys and basement, with sufficiently strong walls to carry two other storeys. Reily, Dawson & Reily, architects.

St. Boniface, Man.

It is reported here that the C. N. R. (T. Turnbull, assistant chief engineer, Winnipeg, Man.), will erect a warehouse and freight sheds, storehouses and round house. It is proposed to share the Union Depot with the G. T. P. Railway there, and build a new bridge across the Red river. The total improvements will cost over $1,000,000.

Sydney, N.S.

A new company capitalized at $100,000 and known as the Nova Scotia Hotel Company, have acquired the Alfonso Hotel and the adjoining Hillis block.

Tofield, Alta.

Tenders are being called for the construction of the G. T. P. station here. The station designed is in the class E. The system for grading in sizes is from A to F.

Toronto, Ont.

Wm. Davies Company has obtained a permit for the erection of a two-storey stores and office building at the corner of Bloor and Yonge streets, $20,000. The Mendelssohn Piano Company has been given a permit to erect a four-storey and basement brick factory building at rear of 110 Adealide street west, $20,000.

Consolidated Optical Company will erect a 4 storey brick building 88 x 138 feet on Richmond street west, just east of Spadina avenue. Machinery to be operated electrically. Denison & Stephenson, architects, King street.

A large retail store, it is stated, may be opened in Toronto, in which Harrods, of London, England, is stated to be interested. The managing director of Harrods was recently appointed to the directorate of the Hudson Bay Company, which also comprises Mr. Wm. Mackenzie, of the C.N.R.

Victoria, B.C.

Mr. Hayter Reed, superintendent of C. P. R. hotels, it is stated, will recommend that the 70-room addition to the Empress hotel be undertaken immediately.

The option taken by the G. T. P. Railway Company on the site for its big new hotel, to be built on Government street, opposite the parliament buildings, has been taken up, and one more block, added, in order to round out the site. It is understood that the hotel will be built next spring.

Vancouver, B.C.

Among the building permits granted was one to Mr. W. T. Whiteway covering a large six-storey warehouse at 130 Water street; cost, $45,000.

Tenders addressed to W. Marbury Somervell, architect, 43 Exchange Building, will be received until September 17th for supply of materials and construction of 8-storey and basement office and bank building for the Bank of Ottawa.

Woodstock, Ont.

By-laws to grant certain privileges to the Canadian Linerman Company and the Fibre Board Folding Package Company, Limited, in return for which factories will be erected, will be submitted to the ratepayers on September 19th.

Winnipeg, Man.

Tenders were called until September 10 for erection of brick warehouse for the W. J. Guest Fish Company, Alexander street. Jas. Chisholm & Son, architects.

There will be a meeting of the C. P. R. directors shortly, at which plans for alterations to Royal Alexandria hotel will be discussed. Mr. Hayter Reed, superintendent of C. P. R. hotels.

Tenders were called until September 10 for the proposed St. John's Telephone Exchange Building. Plans, etc., on application to provincial architect.

It is stated on good authority that the Hudson Bay Stores will be extended to cover the whole block bounded by Main, Fort, York and Broadway streets. Commissioner Chipman is in charge.

Plans have been completed by John D. Atchison, for a structure to enclose the first engine to cross the Red river, which is to be set up in Whyte park. The Board of Control is calling for tenders now for the construction of the building.

Tenders are called until September 14th for the erection of factory for Speirs-Parnell Baking Company. Matthews & Le Maitre, architects, Bank of Nova Scotia Building.

AWARDED.

Hamilton, Ont.

The contract for erection of storage warehouse for the Armstrong Cartage & Warehouse Company has been given to Contractor Cooper, $25,000. Architects, Staunton, O'Heir & Morison.

David Dick & Sons, Welland, have been awarded the contract for the erection of additional buildings for the Oliver Plow Works Company at $15,000.

Morden, Man.

M. McKinnon has the contract for the erection of warehouse for the Imperial Oil Company, of Winnipeg.

Orillia, Ont.

The contract for the office and main building of the Canada Smelting & Refining Company's plant has been awarded to Mr. E. Webb.

Saskatoon, Sask.

Shannon Bros & Cassidy are reported to have secured the contract to erect for the Cockshutt Plow Company, a warehouse to cost about $60,000. F. Peter, architect, Winnipeg, Man.

Woodstock, Ont.

The Industrial Committee awarded the contract for the erection of the buildings for the Woodstock Textile Company to Messrs. T. D. Broom & Son, at $10,800. The contract calls for the completion of the building by December 1st, 1910. Mr. B. McNichol, architect.

Winnipeg, Man.

The contract has been awarded to W. Beverley Robinson, Montreal, for supplying "Carrara" (white semi-glazed terra cotta) manufactured by the Royal Doulton Potteries, London, Eng., for the exterior of the new premises to be erected for the Trust & Loan Company of Canada.

Power Plants, Electricity and Telephones

Brandon, Man.

Prof. Herdt, of McGill University, Montreal, is making an investigation of the various power propositions near this city, at the request of the city council.

Burnaby, B.C.

The site is being cleared for the $80,000 power sub-station to be erected on the G. N. R. line.

Calgary, Alta.

On September 15 the ratepayers will decide whether the following will be issued: $484,000 4½ per cent. 30-year debentures for a municipal street railway; $100,000 4½ per cent. 30-year debentures for parks and cemeteries; $40,000 4½ per cent. 30-year debentures for a subway under C.P.R. W. D. Spence, city clerk.

Guelph, Ont.

On September 26th a by-law will be voted on to issue $85,000 4½ per cent. 30-year street railway debentures. T. J. Moore, city clerk.

Maisonneuve, Que.

See "Business Buildings."

Montreal, Que.

See "Waterworks."

Five companies tendered for street lighting, etc., but three only desired to light parts of the city. The Montreal Light, Heat & Power Company, who have the job of street lighting at present, tendered as follows: For 1,650 lamps or more, $72.70 per annum; for 1,000 lamps, $80, and so on down to 500 lamps at $90.55. At present they are charging $90 per lamp. The Provincial Light & Power Company, a new concern, offered to light the streets for $54.80 per lamp, and enclosed a certified cheque for $25,000 to show their good faith. They propose getting their power from Cedar Rapids. The awarding of the contract was held over until further investigation could be made.

Ottawa, Ont.

Tenders are being called by Board of Control until September 15th for electric light fittings for city registry office. Specifications at office of Architect Ewart, 153 Sparks street. John Henderson, city clerk.

Port Arthur, Ont.

The by-laws to build car barns and to buy land for power plant were carried.

Prince Rupert, B.C.

The question of the city lighting problem has come up again before the city council. The engineer's report showing the cost in detail of establishing the plant required for the temporary scheme at the sash and door factory was presented. The

(Continued on page 28)

Tenders and For Sale Department

Tenders Wanted

Bulk and separate tenders for all or any of the different branches of work and material required in the erection and completion of a

Bank and Office Building

to be erected in Brantford for the Imperial Bank of Canada, will be received up to 12 o'clock noon TUESDAY, SEPTEMBER 20TH, 1910. Plans and specifications may be seen at the office of

TAYLOR & TAYLOR, Architects,
Hope Chambers, Brantford, Ont.

Lowest or any tender not necessarily accepted. 38

City of Moose Jaw,
Saskatchewan

Tenders

Tenders will be received by the undersigned up to 8.30 p.m. on MONDAY, OCTOBER 10TH, for supplying (for the use of the City Fire Department), one standard combination chemical and hose wagon with capacity 50 gallons chemical tank and 800 feet of 2½-inch fire hose, or 40 gallons chemical tank and 1,000 feet of 2½-inch fire hose. Wagon to be fitted to carry one 20-foot extension ladder on top.

Tenderers are asked ot quote prices for either 2½-inch steel or 2½-rubber tired Archibald wheels; also for one extra set of Archibald wheels, 1⅞-inch axle, 2½-inch steel or rubber tires.

Tenderers are asked to furnish detailed specifications and cut of wagon and equipment, and give price f.o.b. Moose Jaw.

The lowest or any tender not necessarily accepted.

W. F. HEAL,
City Clerk.

Moose Jaw, September 10th, 1910. 39

Tenders Wanted

Sealed tenders, addressed to John I. McLaren, Chairman, Board of Control, and endorsed "Tender for Sewers," will be received by the undersigned up to 11 o'clock a.m. of WEDNESDAY, SEPTEMBER 21ST INST., for constructing the following sewers:

Main Street, from Locke Street to West End Main Sewer.

Greig Street, from Little Greig Street to Barton Street.

Sherman Avenue, from Brant Street to G. T. R. tracks.

Ravenscliffe Avenue, both branches.

Aberdeen Avenue, Hyde Park Avenue to Chedoke Ravine.

MacDonald Avenue, from Aberdeen Avenue to Stanley Avenue, and on Stanley Avenue, from MacDonald Avenue to Garth Street.

Chedoke Avenue, Aberdeen to Hillcrest Avenue.

Flatt Avenue, Aberdeen Avenue to Hillcrest Avenue.

Hyde Park Avenue, Aberdeen Avenue to Hillcrest Avenue.

Aberdeen Avenue, Garth Street to Hyde Park Avenue.

Glenside Avenue, Garth Street to Chedoke Avenue.

Hillcrest Avenue, Garth Street to Chedoke Avenue.

Plans and specifications and other information can be obtained at the office of the City Engineer.

The lowest or any tender not necessarily accepted.

S. H. KENT,
City Clerk.

Hamilton, September 12th, 1910. 37

To Contractors

Tenders will be received at the office of the Registrar, Queen's University, Kingston, up to 6 p.m. of TUESDAY, SEPTEMBER 20TH, for the several trades works required in the erection and completion of the Nicol Building for the Governors of the School of Mining and Agriculture.

Plans and specifications may be seen at the University and at the office of the undersigned.

The lowest or any tender not necessarily accepted.

POWER & SON, Architects,
Merchants' Bank Chambers.
Kingston, Ont. 37

TENDERS

Toronto General Hospital
College Street

Tenders addressed to the Chairman of the Building Committee will be received by the undersigned up till noon TUESDAY, SEPTEMBER 27TH, 1910, for all the various trades required in the erection and completion of buildings for the medical wing and administration building in connection with the General Hospital.

Plans and specifications and all other information can be obtained at the office of the architects.

The lowest or any other tender not necessarily accepted.

DARLING & PEARSON,
37 2 Leader Lane, Toronto.

Power Plants, Electricity and Telephones

(Continued from page 27)

total cost was figured out at $11,363, being an increase of $2,400 over the estimate made in the report of August 13th for a 60 kilowatt plant. The operating cost was put at $28,230. Street lamps consumption 87,600 kilowatt hours winter, and 43,700 summer, or 131,400 per year. Consumers consumption was estimated at 114,975 kilowatt hours winter, and 49,275 summer, or a total of 164,250 kilowatt hours per annum, and the city engineer estimated the probable revenue to amount to $29,656 at 10 cents per kilowatt hour.

Strathcona, Alta.
See "Public Buildings."

Sherbrooke, B.C.
The Sherbrooke Railway & Power Company will require new cars of the latest type.

Swift Current, Sask.
Tenders addressed to G. W. Bilgrough, secretary-treasurer, will be received until September 27th for contracts C, power house; contract D, settling tank and intake; contract E, pumping machinery (compressed air system); contract F, electrical machinery; contract G, producer gas plant. J. Darlington Whitmore, engineer, 104 Willoughby and Duncan Block, Regina.

Vancouver, B.C.
In order that the B. C. E. R. may extend the system in all parts of the city and district it has been decided to postpone the erection of a new terminal depot and offices until next year. Mr. J. Buntzen, managing director.

The part which pumping machinery plays in the equipment of a modern pulp mill and paper mill is shown by an order for 11 Worthington centrifugal pumps, recently received by the John McDougall Caledonian Iron Works Company, Limited. These 11 pumps, which will be built in their shops in Montreal, are for the new mill of the Powell River Paper Company, Limited, near Vancouver, B.C. They will have an aggregate capacity of over 37,000,000 gallons in 24 hours, which is about equal to the pumping capacity of the city of Montreal water works. Two of these pumps, having each a capacity of 4,200 gallons a minute against 40 foot head, will be used in the grinder room for carrying ground wood pulp stock to the screens. Two others, of a capacity of 4,000 gallons a minute against 100 foot head, will be stationed in the screen room for carrying ground wood stock to deckers. Others again will be used for carrying stock to beaters and digestors and for boiler feed purposes. Six of these pumps will be direct connected to motors, two of them will be direct connected to a water wheel, and the balance will be belted to motors.

Winnipeg, Man.
See "Business Buildings."

Yorkton, Sask.
W. E. Skinner, of Winnipeg, is consulting engineer to supervise the installation of its thirty-five thousand dollar electric light system. Tenders will be called for immediately for steam, oil and gas producer plants and work on the pole line will commence as soon as possible. It is hoped to have the plant in operation by February 1st.

AWARDED.

Fort Saskatchewan, Alta.
The contract has been let by this municipality to the Evans Construction Company, Edmonton, for the construction of a dam on Sturgeon river at a cost of $20,000. Lighting and power for other purposes will be supplied.

Port Credit, Ont.
The Hydro-Electric Commission awarded the contract for the erection of a distributing station and the necessary electrical apparatus at Port Credit at a total cost of about $90,000.

Winnipeg, Man.
The tender recommended for acceptance of cables for power transmission was that of the Canadian Insulated Cable Company of Montreal. The contract involves $51,520, being for the supply and installation of 46,000 feet of 13,000-volt three-core cable for distribution of the city's power between stations Nos. 1 and 2. Wm. Kennedy, Jr., consulting engineer.

Miscellaneous

Hamilton, Ont.
Recent building permits include: W. A. Pettit, seventeen brick dwellings, corner Fullerton avenue and Princess street, $17,000; Wray & Nichols, ten brick dwellings, Cedar avenue, between Cumberland and

Central avenue, for A. Ward, $16,500; W. H. Yates, jr., brick factory building, Hughson street, between Rebecca and Gore streets, for the F. F. Dalley Company, Limited, to cost $20,000.

London, Ont.

This city may purchase a motor fire engine of 300 gallons capacity, or a steam engine of 1,000 gallons capacity. Alderman Ashplant is interested. Tenders will be called shortly.

Montreal, Que.

Recent building permits include: F. Pageau, 1103 Huntley street, house containing two dwellings, on Boyer street, $2,000; H. L. Deslauriers, 1427 Papineau avenue, house containing five dwellings on Papineau avenue, $5,000; D'Ambroise & Frere, 2828 St. Lawrence Boulevard, four houses containing eight dwellings on Alexandra street, $8,000; A. Arcand, 1216a St. Denis street, two houses containing four dwellings and two stores, 1272 St. Denis street, $8,000; D. Cusson, 171 Parc Cartier street, two houses containing six dwellings on Parc Cartier, $6,008; E. St. Pierre, 159 Parc Cartier, two houses containing nine dwellings, St. Antoine and Lenoir streets, $7,000; Dubuc & Chartrand, 610 St. Hubert street, four houses containing eight dwellings on Mariana street, $7,000; A. Pepin, 75 Buller street, house containing two dwellings on Buller street, $92,000; J. Dugas, 2752 St. Lawrence Boulevard, house containing two dwellings and two stores, $2,300; Mitchell & Deguise, 432 St. Germain street, four houses containing twelvee dwellings on St. Germain street, $10,000; Jules Labelle, 13 Guy avenue, house containing two dwellings on Alma street, $2,500; Protestant School Commissioners, a two-storey dwelling on Canning street, $4,000; D. Raymond, 244 Clark street, three houses containing egiht dwellings on Laurier avenue, $12,000.

Toronto, Ont.

Recent building permits include: N. C. McEachren, pair semi-detached 2-sty. brick dwellings, Strathcona, $4,000; R. Paterson, 2-sty. and attic brick dwelling, on Evelyn avenue, $4,000; N. D. Pratt, 2-sty. and attic brick dwelling, on Edna, $4,000; M. Healy, 2½-sty. brick dweling, 65 Rowanwood avenue, $6,000; Wm. Brown, 2 pair semi-detached 2-sty. brick dwelling, corner Shaw and Garnet, $7,000; G. M. Bryan, 3-sty. brick addition, to pair dwellings, on Yorkville, $8,000; Walker & Palmer, pair semi-detached 2-sty. brick dwelling, near Dufferin, on Millicent, $4,000; D. E. Moore, pair semi-detached 2-sty. brick dwellings, 1105-07 Gerrard street, $1,000; Mills and Holmes, pair semi-detached 2-sty. brick dwellings, near Willoughby, on Central, $4,400; R. C. Bustard, 4 pair semi-detached 2½-sty. brick dwellings, near Harbord, on Crawford, $18,000; A. O. Scott, 2 pair semi-detached 2-sty. brick dwellings, near Emerson, on Royce avenue, $8,000; Jas. McDonald, 2 pair semi-detached 2-sty. brick dwellings, near Emerson, on Millicent, $8,000; Rolph, Clark, Limited, 4-sty. brick and steel factory, rear Simcoe and Pearl, $10,000; Robt. Stubbs, pair semi-detached 2½-sty. brick dwelling, on 680 Manning avenue, $5,000; Dundas Building Company, pair semi-detached 2½-sty. brick dwellings, near Caer Howell, on Murray, $6,000; J. Bone, 2 pair semi-detached 2-sty. brick dwellings, near Wallace, on Campbell, $8,000; B. J. Case, 2½-sty. brick dwelling, on Westminster, $4,000; News Publishing Co., 2-sty. brick mechanical building, rear 107 Bay street, $5,000; City of Toronto, 1-sty. brick lavatory, near Roncesvalles, Queen, $5,000; H. E. Mitchell, 2-sty. and attic brick dwelling near Highland, Binscarth, $7,000; Waters & Porter, 4 pair semi-detached 2-sty. brick dwellings, near Ossington, on Manchester, $16,000; A. G. Saunders, pair semi-detached 2-sty. brick dwellings and stores, near Wallace, on Lansdowne, $5,000; Coltman & Pearson, pair semi-detached 2-sty. brick dwellings, near Garden, on Sunnyside, $4,000; F. G. I. Whellers, 2-sty. brick dwelling, 16 Laws street, $4,000; J. H. Maguire, 2 detached 2½-sty. brick dwellings, on Medland, $5,000; W. J. Cole, pair semi-detached 2-sty. brick dwelling, on Margueretta, $4,000; P. B. Kaiser, pair semi-detached 2-sty. brick dwellings, on Dovercourt road, $4,000; C. McCracken, 2½-sty. brick dwleling, on 267 Havelock street, $4,000; J. J. McLaughlin Company, 3-sty. brick addition to warehouse and shows rooms, 155 Sherbourne, $26,000.

Victoria, B.C.

After nearly two months' delay the tenders for garbage tins, 1,000 of which will be ordered at once, but 8,000 of which will utlimately be purchased, was awarded by the city council recently. The tenders received for garbage tins were as follows: J. A. Johnston, $2.85 per tin; C. M. Cookson, $3.39; Clarke & Pearson, $4.00; Andrew Blythe, $2.80; Joseph Market, $2.70; S. Little, $3; A. Warren, $2.88; H. Pooley, $3.48. Joseph Market's tender was accepted. 1,000 will be required at once and 8,000 ultimately.

Recent building permits include: Mount Edwards apartment house, corner of Vancouver and Coutts streets, $65,000; warehouse for R. P. Rithet & Company, Dallas road, $13,598; Moore & Whittington, dwelling, Fisguard and Richardson streets, $2,500; John Vaio, dwelling, corner of Government and Bay streets, $8,350; Trustees of the Baptist Church, temporary church, corner of Yates and Quadra streets, $2,000.

Vancouver, B.C.

Recent building permits include: Additional storey to the Granville Loan & Investment Company, Granville street, $15,500; R. A. Ogilvie, warehouse, three storey brick, corner Hamilton and Helmcken, $36,000; W. W. Ross, dwelling 1649 Third avenue east, $3,500; Tomlinson & Cook, one storey brick building for stores, Water street, $4,000; J. Skeffington, 1761 Third avenue west, $2,650; J. Lumsden, 115 Tenth avenue west, $3,000; McDermid & McIntosh, 1879 Third avenue east, $2,700; C. Ehler, 522 Salisbury drive, $4,000; H. G. Winters, 1350 Thirteenth avenue east, $2,000; Black & McDonnell, 634 Semlin drive, $4,000.

Winnipeg, Man.

Recent building permits include: All Saints' Church, school, north side of Broadway, opposite Osborne street, $9,500; Salvation Army, detention home, west side of Home street, between Portage and Buell avenues, 3-storey building, $6,500; G. Jones, two dwellings, west side of Horne street, between Wolseley and Ida avenues, $7,000; W. Gray, two dwellings, west side of Ruby street, between Buell and Portage avenues, $9,500; W. J. Hood, two houses, south side of Jessie, between Hugo and Helen, $6,000; Angus Galbraith, two houses, west side of Stiles, between Portage and Wolseley, $3,600; M. McDougall, two houses, west side of Stiles, between Portage and Wolseley, $3,600; A. J. Cowan, house, east side of Home, between Ellice and Sargent, $2,800; L. H. Shepley, church for Rosedale Methodist congregation, northeast corner [illegible]ford and Nassau, $2,500; E. W. Andrews, house, west side Chestnut, between Buell and Wolseley, $4,500.

New Companies

The Andrews Wire Works of Canada, Limited, Watford, Ont., capital $49,000, incorporated to manufacture and sell articles of wood or metal. Incorporators, Alfred W. Andrews and Frank C. Andrews, Rockford, Ill.

The Robertsonville Foundry Company, Robertsonville, Que., capital $20,000. Incorporators, J. Edouard Morency, merchant, and Geo. Rosseau, manufacturer, both of Robertsonville.

Conduit and Cable Company, Limited, of Toronto, Ont., capital $20,000. Incorporators, John F. MacGregor, accountant, and Francis Walkingshaw, solicitor's clerk, both of Toronto.

The T. Sidney Kirby Company, Limited, Ottawa, Ont., capital $100,000, incorporated to carry on business as builders and general contractors for buildings of all kinds. Incorporators, Thos. S. Kirby, Geo. H. Bowie and John C. Roger, contractors, Ottawa, Ont.

British Columbia Portland Cement Company, Limited, Princeton, B.C., capital $500,000. Incorporators, Robt. P. McLennan, merchant, and Jas. A. Harvey, barrister-at-law, Vancouver, B.C. .. ..

The Lesslie Contracting Company, Limited, Kingston, Ont., capital $10,000. Incorporators, Henry E. Richardson, banker, Jas. F. Lesslie and Ernest V. Lesslie, accountants, all of Kingston.

Dominion Wireless Telegraph-Telephone Company, Limited, Windsor, Ont., capital $40,000. Icorporators, Leroy F. Bloomer, Cleveland, Ohio, capitalist, and Thos. E. Clark, Detroit, Mich., electrical engineer.

The Linden Baptist church in Camden, N.J., presents several mechanical features which are of peculiar interest to contractors and builders, not the least interesting being the dome of concrete slabs with which the building is crowned. The dome has a radius of 36 feet 2½ inches and a rise of 27 feet, the cement roofing slabs being carried on 16 wooden rafters built u pof yellow pine boards. Fifteen courses of slabs were used on the dome, the ends being covered with tiles, these being interlocking.

The following is Dr. M. F. Bonzano's recipe for preparing caustic potash lye for removing old paint from iron: Dissolve 2 pounds of potash in a bucket of water, add about 1½ pounds of slaked lime and stir it well. With a mop apply this mixture to the paint, and after a few minutes it may be easily removed by scraping. As rapidly as the old paint is scraped off rinse the iron with fresh water and dry it. This will leave the iron clean and bright.

The B. C. Gazette gives notice of the incorporation of the following companies:—Canadian Holding Company, Limited, capital $1,250,000, incorporated to carry on the business of loggers, contractors, dealers in bricks, cement, lumber, etc.; the Vancouver Sewer Pipe and Refractories Company, Limited, capital $250,000; the Bridges Lumber Company, Limited, capital $125,000; Electric Railways Construction Company, Limited, capital $600,000; Notch Hill Builders' Supply Company, Limited, capital $75,000; Shurly Dietrich Company, Limited, capital $100,000, incorporated to manufacture, sell and deal in saws, mechanics' tools, etc.; the Dominion Radiator Company, Limited, capital $600,000, incorporated to manufacture radiators, heating apparatus, plumbers' supplies, etc.; the Swanson Bay Forests, Wood Pulp and Lumber Mills, Limited, capital, $1,500,000.

The Field of the Constructing Engineers

An Increasing Scope for Techincally Trained Men with Initiative and Insight into Practical Work—Desiderata for the Position

The constructing engineer is rapidly winning a professional standing decidedly novel in some of the latest developments. Until quite recently it has been customary for the plans for civil engineering works to be developed in minute detail at the headquarters' designing office, and the field work of the resident engineers was little more than inspecting and clerical. This system is giving way under some conditions to one in which the field staff has far greater responsibilities. The general designs prepared in the main office go to the field for criticism and suggestion regarding details, and the latter are not developed until after the field staff has made a thorough study of the best methods of fitting the general projects to the local conditions. In some cases the final plans for the details are made in the office of the constructing engineer, in order that his more accurate knowledge of the problems that will arise during the execution of the work may be utilized to the fullest extent. In this way, the old time resident engineer, who was little more than an inspector, is being superseded by a man with sufficient knowledge, responsibility and executive ability to co-operate fully with contractors endeavoring to carry out the work properly and to interpose a firm and successful resistance to any attempts to scamp the work.

As a result of these changed conditions, a demand has arisen for field engineers possessing certain characteristics which were described forcefully by Mr. John A. Bensel at a recent dinner given to the Board of Water Supply of the city of New York. The development of engineering, in his opinion, has reached a state when it is necessary for us, while acknowledging that we can be licked and killed, to prove that we cannot be scared because things not covered by precedents are presented to us. Mr. Bensel said: "No engineer is worthy of being entrusted with responsible charge of work who is afraid of the risk involved in such responsibility, and yet, as a matter of fact, one too often finds a fear for the personal result of a line of action to be the governing motive in arriving at a decision." Just how far this criticism is accurate is left to the reader; it is made by one of the leading engineers of the country, of wide experience, particularly in works undertaken by public authorities. Another statement that he made was: "One too often finds men afraid to risk anything by a separation from the protecting arms of precedents, thereby becoming as useful along the lines of professional activity as a well-wrapped Egyptian mummy in the affairs of living men." This certainly is pretty strong, and when printed in cold type it has a harshness which was softened, when it was spoken, by the speaker's smile. Inferentially it explains, however, the reason why the constructing engineer is rapidly having more and more responsibility put upon him, while that of the designing engineer is diminishing. The constructing engineer is face to face frequently with conditions whose solution must be made without regard for precedents. A knowledge of engineering principles and of various methods of construction is as necessary as an acquaintance with previous practice, and unusual resourcefulness has consequently become the primary requisite in such a position.

The delegation of large authority to the field staff and its association with the designing office during the preparation of plans and specifications may result, however, in a condition productive of legal complications. It is in this respect that the new type of engineering organization is most open to criticism. When plans and specifications are made part of a contract, any subsequent change in them is likely to open the way for claims for extras. It is the easiest thing in the world for a contractor, bent on securing such extras, to obtain from a resident engineer in the presence of witnesses a verbal consent to accept something which differs from just what has been specified. It is evident, moreover, that where the resident engineer has taken part in the preparation of plans and specifications and knows thoroughly the intention of them, down to the most minute detail, his inclination is to accept something not called for in place of something that is, provided the substitute will serve the purpose equally well and will materially help along the progress of the work.

On large undertakings or those where difficulties will certainly arise which cannot be exactly foreseen, considerable latitude must necessarily be left to the field force. Provision should be made for this, however, in the contract, and also in the instructions governing the constructing engineer. Probably every field engineer of much experience has been in charge of work where foundation difficulties have been developed, where piling became necessary in places and footings had to be spread owing to unforeseen defects in the soil. Where the work is being conducted far from headquarters with which communication is slow and tedious, while the early completion of the undertaking is urgent, it is a mistake not to give the man in responsible charge on the ground authority to meet the conditions that arise.

If a competent man is on the work as constructing engineer, he should be provided with the necessary authority to use his knowledge and experience for the advantage of the work. Otherwise the expense of keeping him there is wasted. The only reason why this responsibility is not given to him more often is through a lack of satisfactory means for doing so in a legal way, and the sooner this point is settled, the better it will be for economical field construction. As Mr. Bensel well said, more real engineering progress is evidenced to-day in the methods of construction than in the design of the works themselves. The constructing engineer has necessarily become an important factor in any large undertaking, and it is time that his duties and responsibilities received more thoughtful attention.—Engineering Record.

According to a recent dispatch from Winnipeg, the Builders' Exchange of that city have decided to declare a lockout unless the striking bricklayers resume work immediately on the Lyall-Mitchell Company's construction. In Winnipeg building circles it is considered that the joint arbitration board was a thoroughly represented body; its finding had been mutually agreed upon and the action of the union in setting aside the decision is considered most unreasonable.

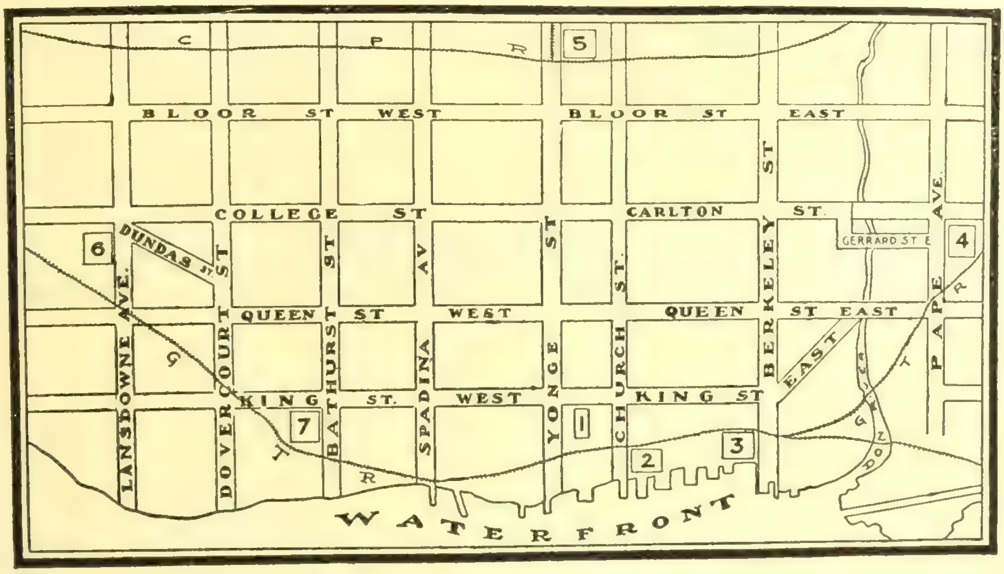
Mr. A. H. Van Cleave, of Niagara Falls, N.Y., has been appointed city engineer of London, Ont., vice A. O. Graydon, resigned. The position is worth $4,000 per annum.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5

No's
2,
4,
5,
6



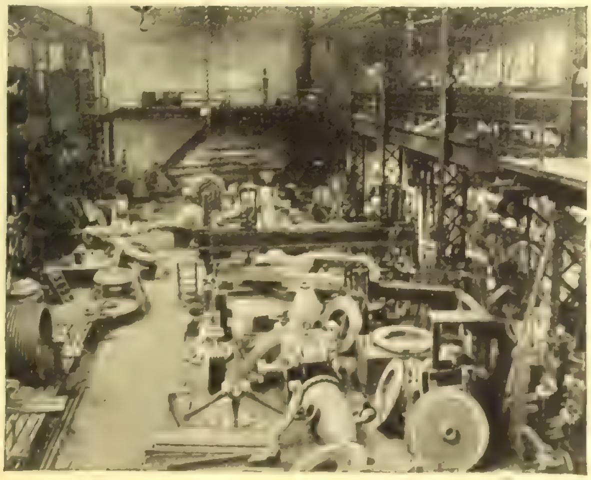
Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is

PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WORTHINGTON TURBINE PUMPS

EFFICIENCY TELLS



Over 80 per cent of the turbine pumps in Canada have been built in our shops from the designs of our consulting engineer, Mr. W. C. Brown, formerly chief engineer for Henry R. Worthington, New York.

The illustration shows the following turbine pumps under construction:

6 for Toronto, daily cap. each........6,500,000 gals.
1 " London, " " " 1,500,000 "
2 " Hamilton, " " " ....6,000,000 "
1 " Lachine, " " " 5,000,000 "

SEND FOR DESCRIPTIVE LITERATURE

Works—512 William St., Montreal

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

The “V
is the best Cont

Steady
Strong
Durable
Efficient

We solicit your enquiries for

Steam Shovels - Dump Cars
Rock Drills - Drill Steel
Blasting Equipment

Head Offices and Warehouses :
Montreal

MUSSEN

LCAN"

tors' Locomotive

Great Hauling Capacity

Quick Steamers

All Parts Easily Accessible

Reliable for Heavy and Continuous Service

LIMITED

BRANCHES:

Toronto -	73 Victoria St.
Cobalt, Opp.	Right of Way Mine
Winnipeg -	259-261 Stanley St.
Calgary - -	Crown Block
Vancouver - -	Mercantile Bldg.

The Hamilton Steel & Iron Co.
Hamilton - Canada
LIMITED

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto September 14, 1910 No. 37

The City Engineer as a Contractor

When is a city engineer not a city engineer? We venture to think that the writer of a letter published in this issue would have little difficulty in offering an approximate solution.

The city engineer's "estimate" in many cases provides a reasonable objection on the part of contractors. It cannot be denied that there is a certain unfairness in contractors having to compete with the engineer when the latter is bidding under entirely different conditions. The engineer's estimate seems to be made on the "heads I win, tails you lose" basis. It is not required to come within a certain figure, no deposit cheque is required, neither is a bond of any kind necessary. The case cited in the letter to which we refer provides a good example of the unfairness of the thing. A 10 per cent. retainer for three years has to be figured on by the contractor and the loss of interest has to be included in the expenses of the work.

It is against the etiquette of the architectural profession to engage in building and surely it is opposed to all the principles of common sense and economy for an engineer to contract for his own work. It is sometimes adduced in favor of the city engineer in the capacity of a contractor that it facilitates the modification and changing of plans after the commencement of work, but surely such an argument reflects upon the capability of the engineer, whose first essential is that he be qualified to devise contractors' requirements for varying conditions. Changes in the plan are more often the result of an incomplete grasp of the problem, and even if there be a possible increase in the cost of construction resulting from modifications after the award of contracts it is more than likely to result in an ultimate saving in cost and increased efficiency.

Every man to his own particular calling. The contractor has the practical experience and the first hand knowledge of construction that the engineer does not possess, and it is economically absurd to try and pit day labor against the contract system. Apart from these considerations there are several other interesting points contained in the article published on page 36 of this issue.

Changes in Plans and Specifications

An engineers' accountability to a client is generally of a peculiar character, except when he is engaged on a salary basis, because few engineers make any definite contracts respecting their own services. Architects are much better off in this respect, because the form of contract for architectural services of the American Institute of Architects is practically universally employed in this country, and a similar form, which has been interpreted and tested by numerous judicial decisions, is employed in Great Britain. Even among architects, however, great caution must be exercised in their dealings with clients, as Mr. H. A. Hudson pointed out in an address before the Royal Institute of British Architects. In his legal connection with members of the profession, he had observed a tendency among them to believe they could work their own sweet will in every thing, though this is far from the facts. They get into trouble because they fail to keep their clients regularly and promptly informed of the variations from plans and specifications necessary in a building while it is in course of erection. Mr. Hudson counseled them to bear in mind that there is grave question regarding the scope of any variation which may be safely ordered without the client's knowledge, unless the architect is willing to assume responsibility for the changes. Such advice is still more applicable in the case of an engineer serving a client without any written contract. Under such circumstances it is always desirable to submit immediately to the client for his approval copies of all orders making any needed modification of requirements which have been previously adopted, with a full written explanation of the reasons for the change and a request for an approval of it. It is only in this way that the engineer can prove in court the limitations of his responsibility for changes in plans and specifications. He should never forget that he is the interpreter and not the maker of the contract between the client and the contractor, and whenever his interpretations approach the field of orders for changes he must exercise great caution.

A feature of interest in the settlement of the bricklayers' strike at Montreal is the provision that no members of the union "shall be allowed to work for any person, firm of corporation not a bona fide builder or contractor for less than 10 cents more per hour than the current rate of wages." The city is alarmed at what savors of a combination in restraint of trade. The question is whether a protective clause of this nature is a restraint. Should not the regular contractor have a little advantage over the casual employer who steps into another man's business for fear that a working profit should be made out of him? Doubtless the clause will be the cause of a little anxiety to the advocates of the day labor system, for it would be hard to prove that the city is a bona fide builder or contractor.

The article on the Detroit river tunnel construction, published in this issue, will doubtless be of interest. Final touches have been put to the work and two large electric locomotives are at Windsor, Ont., awaiting operation

An Arbitrary Compensation Act

The New York State Legislature has the distinction, if such it be, of having passed one of the most arbitrary labor acts on record. Under the provisions of the enactment a workman is entitled to compensation for injury even though the accident be brought about by negligence or carelessness on his own part. The Act is stated to have been passed by the legislature in compliance with the recommendations of the Wainwright Commission, which spent several months investigating cases of refusal by employers to grant financial relief. Heretofore a workman disabled by accident could get no damages until he had shown that the injury was due to the negligence of his employer, but this formality is now dispensed with. Canadian contractors will doubtless be interested in developments. Doubtless we shall see a material increase in the number of building accidents reported and contemplated over the border.

The City Engineer's Estimate

Winnipeg, Sept. 7, 1910.

Editor, "Contract Record":—

In a recent issue of your journal I noticed an editorial reference to the matter of city engineers bidding on municipal work.

Certainly there could be no objection to having the city engineer submit an estimate if, as you suggest, he were to bid under the same restrictions that are laid upon contractors.

Recently I was requested to bid in a certain city in Saskatchewan, and after making three trips to secure the necessary information and to put in my tender at a cost of at least $200 (partly due to the delay in securing plans and specifications), I was within a fraction of a cent a square foot of the "estimate" of the city engineer. Although I pointed out to the council the absurdity of awarding the work to the engineer, who lacked contracting experience, who did not have to put up bonds or even to guarantee his work, who did not even put up a deposit cheque, who did not have to pay for water, or for insurance on labor or the public in case of accident, etc., they decided to let him do the work and run chances.

Apart from these considerations, the specifications called for the purchase of cement from the city at a profit of about 20 cents per barrel, and also for a retainer of ten per cent. of the contract moneys for three years without interest. The use of the money alone was sufficient to make more than the difference in the prices quoted. I refuse to say "tenders" because the city engineer's was only an estimate.

Unfortunately for the poor ratepayer, the work, I am told upon good authority, is proving very unsatisfactory, and has been delayed much longer than if done by contract. The worst feature of this particular case is that there is a prospect of there being little competition next time, as contractors do not care to waste time and money on such cases.

It is too bad that councillors cannot see these things in their proper light, as it stands to reason that an engineer, even though the best in his profession, cannot do the work as well as a contractor who has spent years in perfecting an organization, choosing his experts in different branches of the work and using his experience in securing the best results.

In the particular instance to which I refer, the cement was being supplied to the city by an alderman (under the guise of an incorporated company). It looked to me like a case of "a bird in the hand is worth two in the bush."

The writer does not feel in the least displeased at losing this particular contract, but he does feel very sorry for the poor ratepayer who has to take what he gets in the shape of poorer results at possibly a greater cost than if the contractor were paid a price slightly in advance of the "engineer's estimate."

City engineers have admitted to me that they would rather see work left undone than have it carried out by day labor. These men see that the work is properly done when let by contract and the ratepayer secures value for every cent expended.

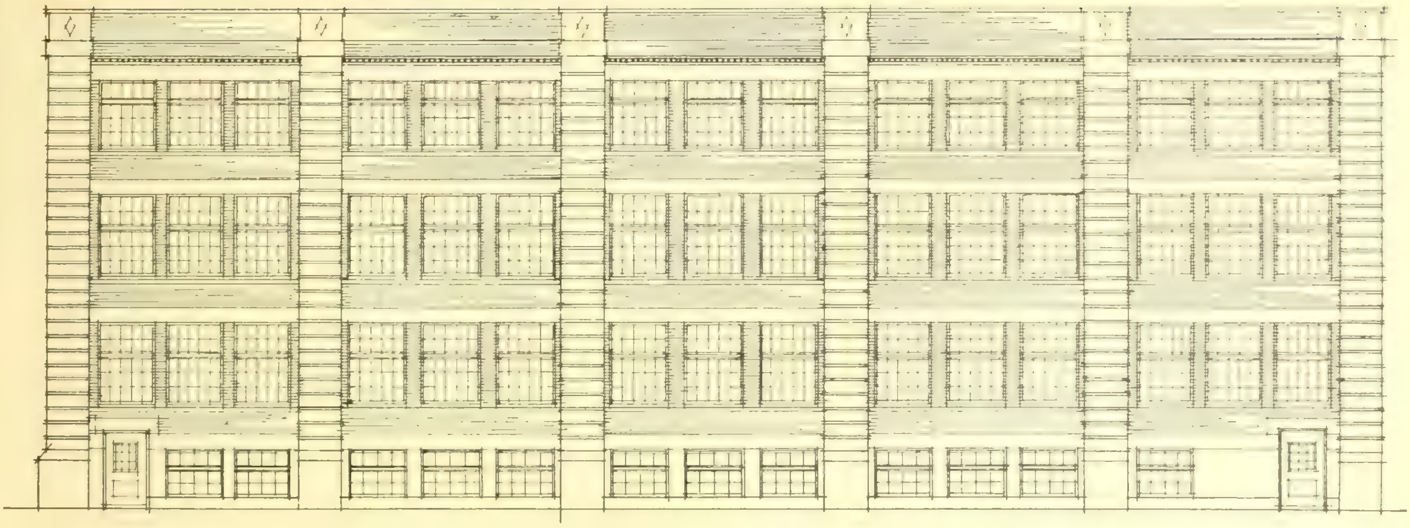
Yours very truly,
WESTERN PAVERS, LIMITED,
Charles Curtis, Manager.

Rules for Measuring Concrete and Excavation

A joint committee, consisting of architects, engineers and contractors of the city of Chicago, has recently adopted rules for measurement of excavation and concrete work. The formulated rules cover all the details for this kind of work on building construction, defining specifically how certain classes of work shall be paid for. The adoption of this set of rules, according to our contemporary, the "Contractor," of Chicago, is the outgrowth of difficulties in coming to an agreement for compensation, entailing not only disputes and bad feeling between the parties, but litigation as well. It is only natural that a contractor will make claims for extra compensation when his margin of profit is dwindling because he was obliged to go to additional expense in erecting forms for concrete, or sheeting in for excavation, which could not be foreseen when he made his estimate. Under the rules drawn up, provision is made for these contingencies, and extra compensation is allowed where excavation becomes difficult, or where forms for concrete are complex, so that they require not only more time, but additional outlay for material.

There can be no doubt that the step taken by this committee is in the right direction, and that much resultant good will be the outcome. More than this, it is worthy of imitation and an extension with modifications to suit, into the general contractors' field. Here it would undoubtedly prove quite a factor in solving some of the problems which arise in reference to proper compensation. Most contractors would not require deep research in the repertory of their work to adduce instances of this kind, where, for instance, the encountering of a certain kind of material made the execution of the work a dead loss at agreed prices, which would not have been accepted had the circumstances been foreseen. It is a fact well known to contractors that in many of these cases the solution has to be sought in the arbitrary decision of the engineer, who would or would not allow additional compensation, according to his interpretation of the contract or specifications. In almost every contract instances of this nature arise, and it would seem that a logical solution would be the establishment of standards to cover these contingencies.

As a step towards standardization alone, this Chicago body has marked an advance. A little study of organization proves that the establishment of standards has been the keynote of success for all enterprises, which would apply in this case. It would furthermore promote good feeling between all parties concerned, which in turn would result in better work. Another benefit which would result from this is that the establishment of such rules of measurement in the general contracting field would make a better basis for estimates.



Alliance Manufacturing Building, Montreal—Elevation to Clark St.

Turner "Mushroom" System at Montreal

First Application in the Eastern Metropolis—Its Several Advantages as Illustrated by the Alliance Manufacturing Building

An interesting reinforced concrete building is now being erected in Montreal and we have pleasure in illustrating a form of construction known as the "mushroom system," which, although used quite extensively in the west of Canada and all over the United States, is its first application in Montreal.

The Turner "mushroom" system, as described in a pamphlet issued by the patentees, is so called from the peculiar formation of the rods and the concrete around the column head and for the remarkable rapidity with which it may be erected.

The idea of this system is:

(1)—To build the floor slabs so as to transport the load directly to the columns without the use of beams and girders and take full advantage of the extraordinary strength developed by slabs reinforced in several directions.

(2)—To simplify the centering and thus to reduce the cost of the temporary parts of the construction.

(3)—To eliminate the beams and ribs which interfere with light, catch dust, cost money to plaster and finish, and reduce the clear storey height. The arrangement of the reinforcement is designed with a view to secure the maximum efficiency of the material and place the maximum amount of steel around and over the top of columns where shear and the negative moments are the greatest.

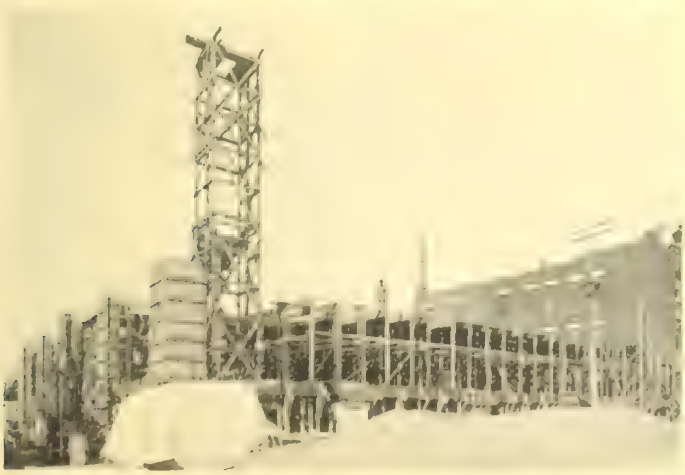
The flat ceiling so obtained gives free and unobstructed illumination from the windows and permits one to place partitions anywhere without regard to the floor, giving unusual stiffness and solidity due to the fact that a part of the material which in the beam type is placed in the rib, is consolidated in the slab, making the slab of unusual thickness with an actual decrease in the total amount of material where the loads are at all heavy.

In a factory building, such as is illustrated, the "mushroom" system possesses the following important advantages:

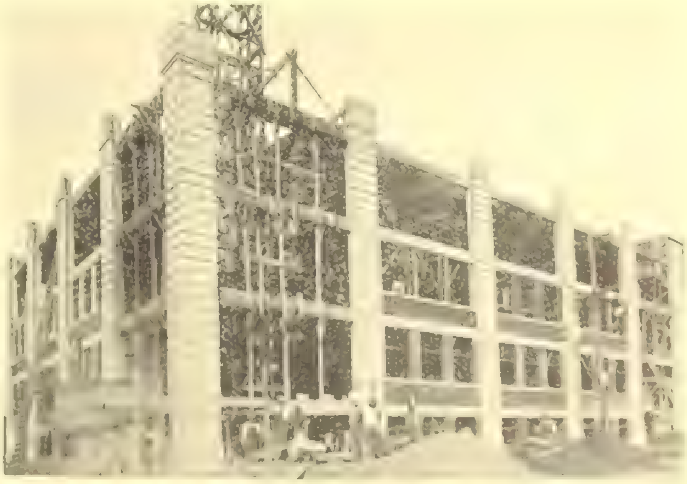
(1)—The better distribution of light.

(2)—The flat ceiling enables more convenient places for shafting than where ribs are used.

(3)—Freedom from vibration—owing to the fact that any concentrated load brings into action the reinforce-



Centering in Place for First Floor



Constructional View from Clark St., Aug. 18th, 1910.

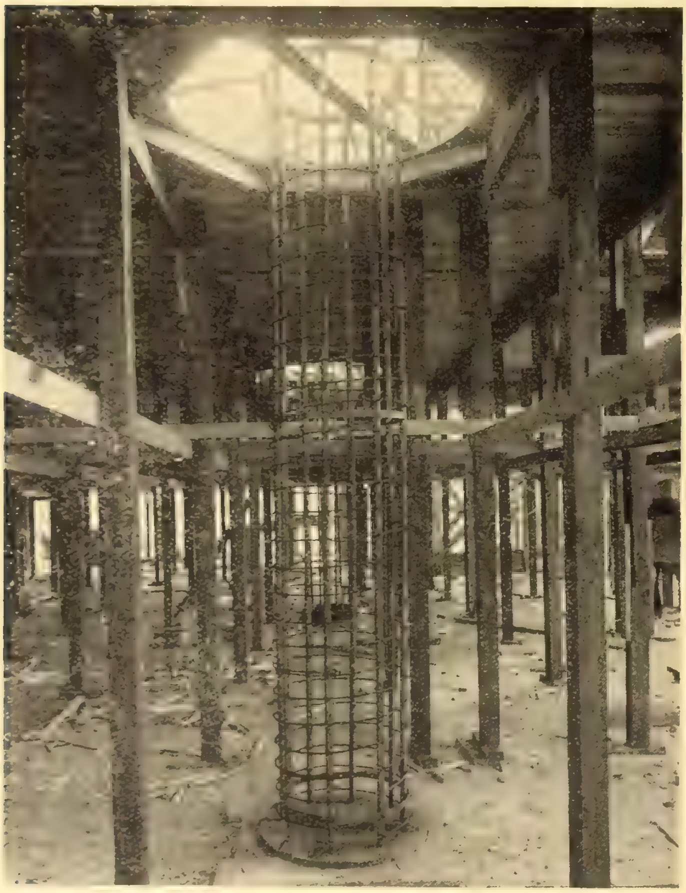
ment of the entire panel, it has little local effect and consequently the construction is more nearly free from vibration than any other type of construction being put up to-day.

(4) Great saving in the first outlay—and reduced time of construction.

The Alliance Manufacturing Building, which is being built for Messrs. L. H. & N. A. Timmins, is 115 feet long and 88 feet wide. It has a basement 12 feet high, and three floors 11 feet high from finished floor to finished ceiling.

The distribution of light is a perfect one, the building having light from three sides. When completed this month the structure will be the most modern and up-to-date factory in Montreal. It will pay the lowest insurance rate in that city.

The outside columns are built of reinforced concrete and the material has been relieved on the outside by forming deep rustications and finishing the surface with a tooled granite concrete face.

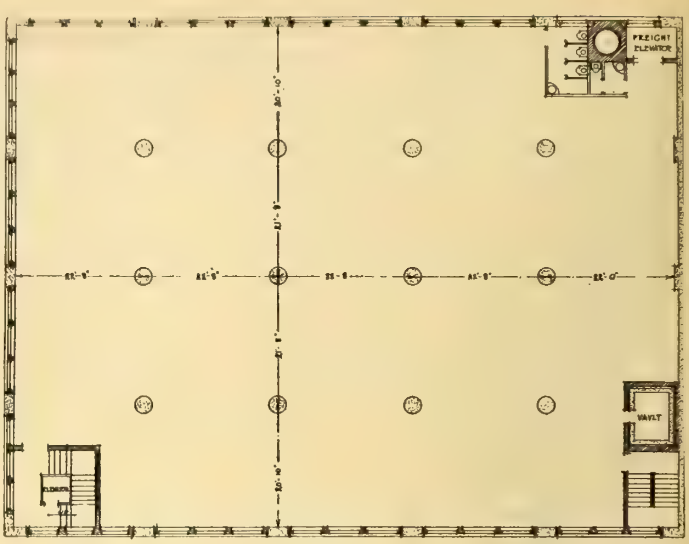


e nforcement of Column on Second Floor, Showing the Bars Turned Over at Cap

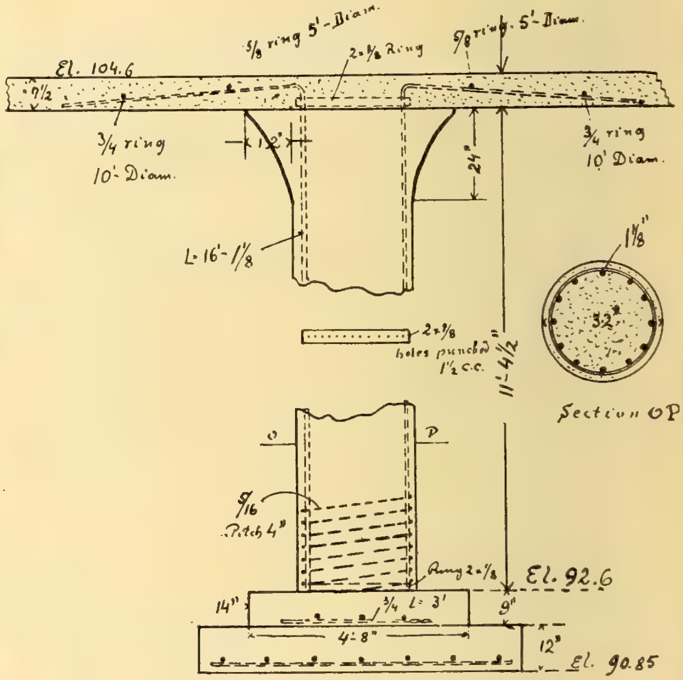
The floors are formed of hardwood throughout. The whole of the building is equipped with a sprinkler system by the Rockwood Sprinkler Company. The smooth ceilings (without beams or panels) permit the spacing of sprinkler heads to cover the maximum amount of area possible and reduce the cost of equipment.

A complete system of blower and ventilation with air washers, which allow the building to be cool in summer, is being installed. Two 100 h.p. boilers and one 150 h.p. engine have been erected in the basement by Messrs. Ross & Greig, of Montreal.

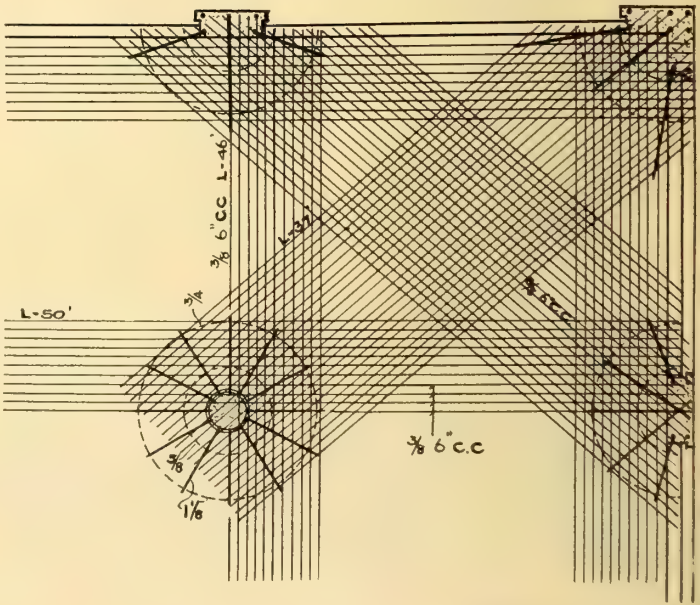
Much credit is due to the engineers and contractors, the Atlas Construction Company of Montreal, for the expeditious way in which the building has been erected



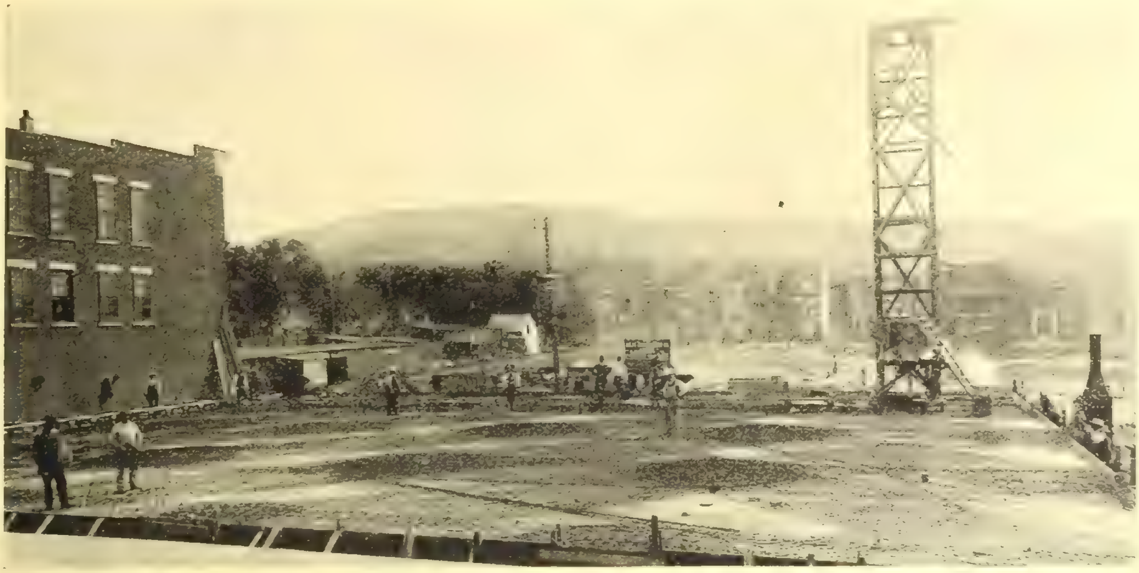
Floor Plan



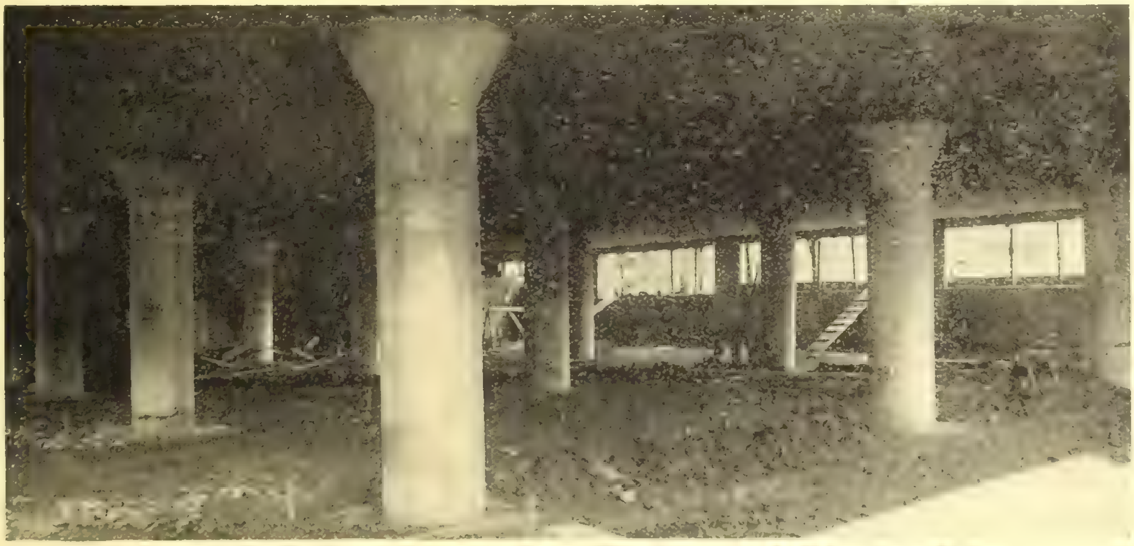
Plan and Elevation of Column



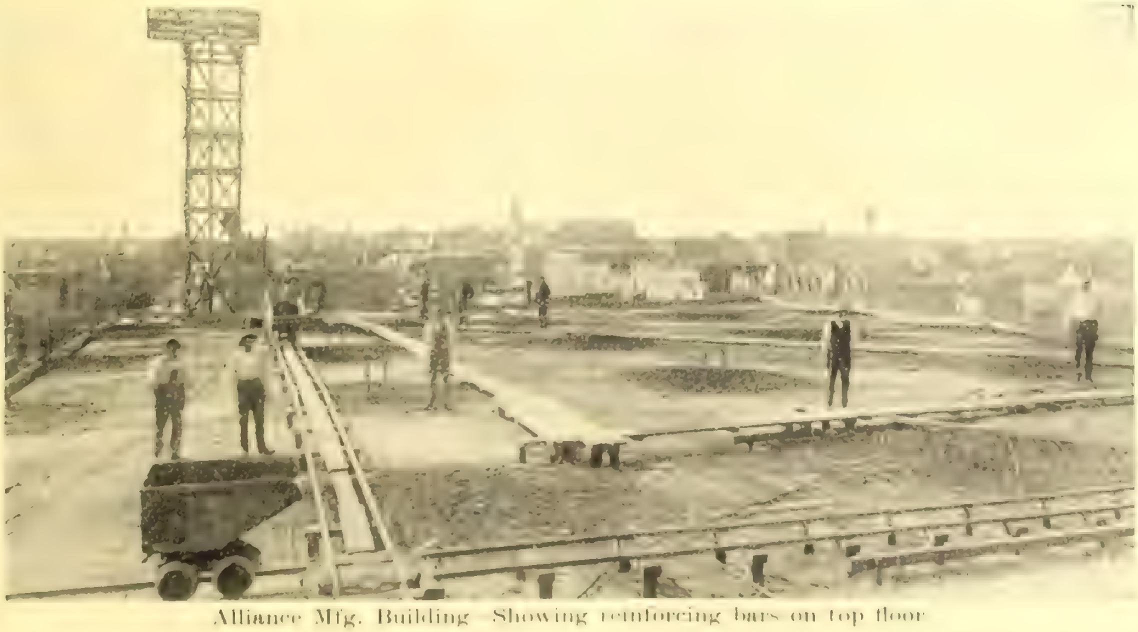
Typical Reinforcement for Panels



Alliance Mfg. Building—June 16, 1910. Steel Bars in position for concrete of first floor



Alliance Mfg. Building—Basement floor. Note absence of all beams and ribs



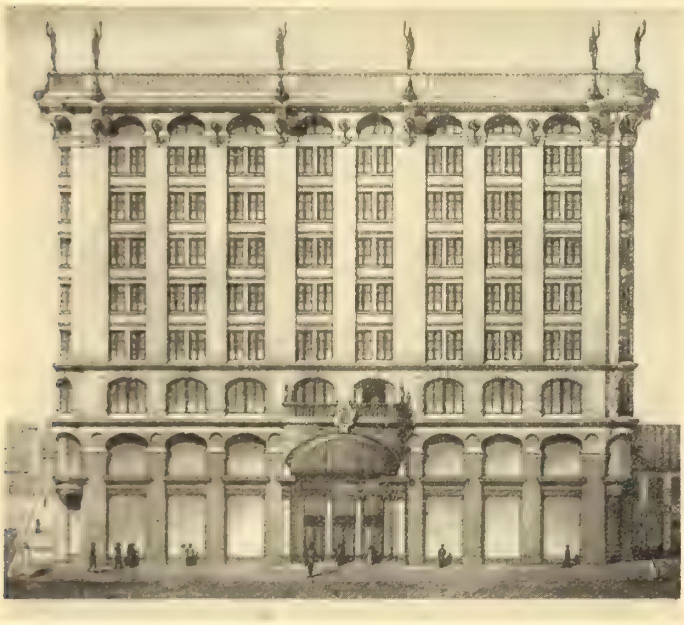
Alliance Mfg. Building—Showing reinforcing bars on top floor and for the high quality of their work. Building operations were commenced at the end of April. After the excavations were finished, the building progressed at the rate of one floor in ten to twelve days. It will be finished two months or six weeks ahead of time.

The foundation footings and columns are designed for two additional floors which may be built at a later date. The floors are designed for a live load of 150 lbs. to a square foot. These are reinforced with plain round bars and all columns are of the Considere hooped type.

The subcontractors for the plumbing were Messrs. Selkirk Bros. The Philip Carey Company undertook the roofing. The elevator was supplied by the Otis-Fensom Elevator Company. The electric wiring, which is concealed in tubes embedded in the body of the concrete, was installed by M. Rubenstein. Mr. C. G. Craib was superintendent of the work for the Atlas Construction Company, whose president, Mr. M. Morssen, C.E., acted as consulting engineer. Mr. Philip J. Turner, F.R.I.B.A., Board of Trade Building, is the supervising architect.

Modern Building in Old Quebec

The new building now being erected at Quebec by the Quebec Railway, Light, Heat & Power Company is situated at the corner of Crown and St. Joseph streets, two of the old capital's busiest thoroughfares. The building is of steel skeleton construction, fireproofed with concrete and terra cotta. The first two storeys of the structure are to be of granite and the remainder of the building either of limestone or marble. As will be seen from the illustration, a feature is the main entrance, with cornice of architectural terra cotta. Freight and passenger elevators will be installed. The plumbing equipment will be on the most sanitary and improved lines.



Quebec Light, Heat and Power Company's Proposed New Building at Quebec.

The ground and first floors, with the exception of a portion of the ground floor, which will be devoted to banking purposes, are to be occupied by the offices of the company. The upper floors are laid out in offices for rental purposes. These will be replete with every modern improvement, particularly in regard to light and ventilation. The building is well located, facing on four streets. Mr. R. P. LeMay, of Quebec, is the architect.

Concrete Mixer Plant for Roadbed Repairs

The concrete mixing plant used in connection with the roadbed work of the Detroit United Railway is so arranged that there is no manual labor at any stage in its operation except in emptying cement bags and trimming, following the deposit of the material by the mixer. Owing to the character of the soil it becomes necessary on the main thoroughfares to reinforce the regular foundation with a broad concrete mat to withstand the hammering of the heavy city cars and suburban coaches which run over the lines. Dump cars, loaded with gravel by a locomotive crane at a dock in the suburbs of Detroit, are drawn to place by an electric motor car and their contents dumped between the rails of the track under construction. A car loaded with cement in bags is then run over the gravel pile and the cement deposited. A concrete mixer plant, mounted on wheels and provided with a scooping device, is run forward and a shovelful of the cement and gravel mixture scooped up, raised, and discharged into a 5-cubic yard hopper above the mixer, from which a charge of 2 cubic yards is delivered to the mixing drum. While the material is being mixed the machine is run back to the point of delivery and a batch of concrete is dropped between the rails and levelled off to the correct height by lowering a levelling board at the rear of the machine and running forward slowly. Trimming and final levelling is done by a crew of three or four men who follow behind the mixer.

The concrete mixer consists of a rigid platform of steel I-beams covered with a floor of $\frac{3}{8}$-inch steel plate and resting upon two Peckham trucks, which are equipped with four 30 h.p. motors. The mixing drum, of the hollow rotating type, is mounted on rollers on this platform and is rotated by a motor geared to it and resting on the same platform. The shovel for raising the aggregate to place in the hopper is raised and lowered by another motor geared to a windlass drum, both resting on the same platform. The hopper is suspended on a steel frame over the mixing drum and delivers the aggregate to this drum in batches of 2 yards as desired, and can fill the drum from either side of the bin. The mixing drum is similar to those used in Smith mixers. A tank holding water enough for six batches is carried in the rear of the control platform. The shovel for loading the hopper is carried by two long channel bar arms on either side of the machine, one end of each bar being attached to the shovel and the other end being pivoted to a cast iron arm suspended from the side of the platform. The whole is low enough to get a good push into the gravel pile and the arms are long enough to swing the shovel clear of everything and to bring it to a vertical position over the bin, where its bottom is tripped and the contents dropped into the hopper. In working it is customary to load the drum with a batch of 2 yards first, then close the slides in the bottom of the hopper and load it to its capacity.

The mixer is handled by two men, who stand on a platform high in the rear of the machine, where all the apparatus is located for the control of the drum and shovel and the progress back and forth of the car. Six other men handle all material from the car and finish levelling on the track. The capacity of the mixer is about 180 cubic yards in 10 hours, or counting in the time of transfer from line to line, repairs, etc., about 300 cubic yards in 24 hours. The entire cost of the plant for concreting, including the mixer, crane, 27 dump cars, 2 motor cars, gravel dock and miscellaneous tools, is approximately $57,000. The saving per yard on the lowest price that the company is paying a contractor for laying concrete is $1.25.

The Detroit River Tunnel Construction

Description of the Novel Engineering Features of the Work — Sinking Tubes and Embedding in Concrete—Resourceful and Successful Scheme

When it was first suggested to construct the Michigan Central Railroad's tunnel under the Detroit river between Windsor, Ont., and Detroit, Mich., by the methods described in the following columns, not a few engineering experts expressed their doubts as to the practicability of the scheme. The completed work, however, vindicates the judgment of the engineers behind the enterprise and is a standing tribute to their resourcefulness.

The method pursued in the construction is the novel one of constructing tubes in the form of steel shells; sinking them into a trench dug in the bottom of the river; uniting them end to end; embedding them in a concrete casing and finally giving them a concrete lining. No compressed air was used in the subaqueous portion of the work except for the divers by whom the bolts, fastening the ends of the tube sections together, were placed.

In considering this plan it must not be confused with that of sinking independent caissons that were joined end to end, as in the case of the Metropolitan Railway under the Seine at Paris. There the regular caisson method of sinking was followed, using compressed air in the usual manner. The caissons were independent sections, to be sure, and were afterwards joined together to form the tunnel. The Detroit tunnel, on the other hand, was formed by excavating a ditch across the bed of the river, setting a core in it and filling around with concrete, no caisson work being done at all.

The evolution of the idea is interesting and direct. The water in the river is 50 feet deep in places, and it was the natural desire of the engineers to keep as high as possible so as to avoid long or heavy approach grades; and so, when studying the situation, regrets were expressed that the bottom was not of rock so that the minimum of cover could be used. This suggested the excavation of a trench and filling it with an artificial rock (concrete) and then tunneling through that. But why tunnel? Why not sink a core and form the concrete around it? That was the birth of the idea and the completed tunnel is the result.

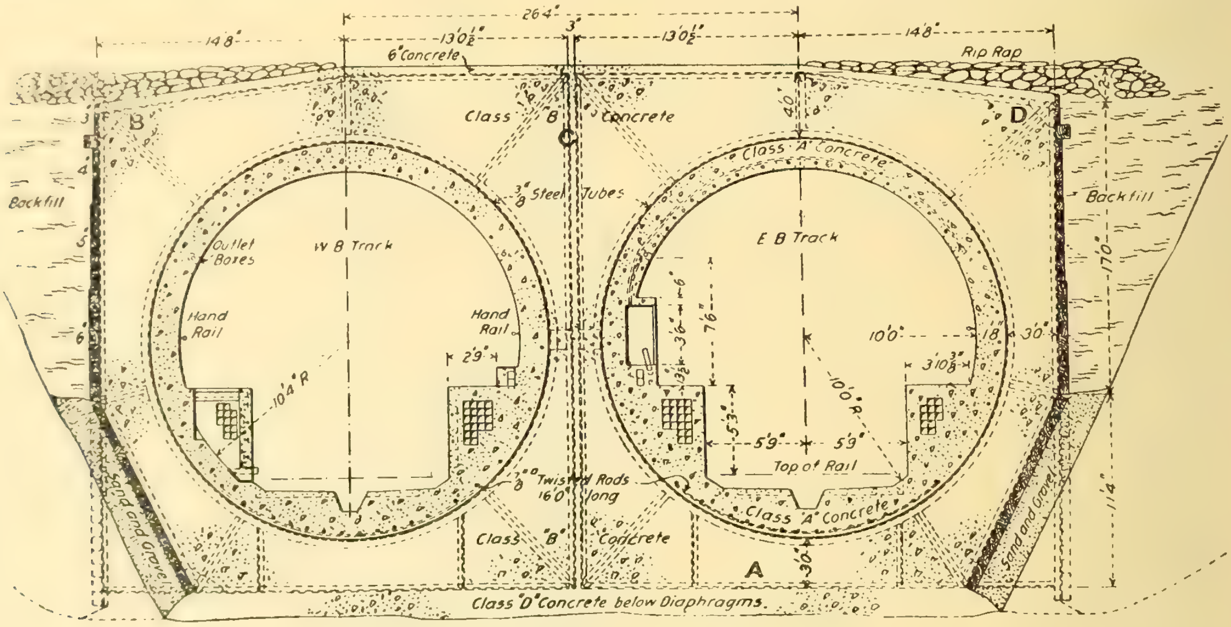
The scheme, simple as it appears in outline, was novel and daring in the magnitude of the undertaking and the depths of water to be encountered, but the results have fully justified it, for the completed work is dry and considered by its engineers to be one of the strongest subaqueous tunnels in existence. While the general scheme was one of simplicity itself, it is evident to anyone versed in such matters that in its execution for the first time, problems of novel character would be constantly arising, the solution of which would tax the resourcefulness of the engineers to the utmost in order to reach a successful consumation. These problems cropped up from the very start. They began by presenting unexpected difficulties in the excavation of the trench in the bottom of the river in which the tubes were to be laid. The greatest depth of water at the point of crossing is about 50 feet and the excavation was carried some 22 or 23 feet below this, or 74 feet from the surface. A bucket dredge was equipped to work to 40 feet, and did excellent work, taking out 1,500 cubic yards per day. It was the intention to let the dredge lead and follow with a clamshell for the balance, but when the latter was set to work it was found to be unsuited to the task and that, at the rate which it could dig, the time required would be so long as to place it outside the pale of consideration. The first step, then, was to reconstruct the bucket dredge and adapt it for working to depths of 60 feet. But, although braces and strengthenings were added, breakages occurred to such an extent that tht idea had to be abandoned. This was especially caused by the breakage of the spuds and the great expense attending the same. The solution was found in the designing of a special clamshell capable of removing 700 cubic yards per day of 12 hours on an average with a maximum output of 1,200 cubic yards.

An early stage in the construction of the Detroit River Tunnel. Easterly open cut, Windsor, Ont.

The material to be removed from the river bed and from the approach tunnels was a stiff blue clay, and the total net quantity was about 700,000 cubic yards. The methods of removal were dredging from the river bottom and tunneling, both with and without a shield, in the approaches. It was thought at first that the drifts could be driven without using compressed air and some of the work was done in that manner for the centre wall. A drift was first carried forward for one of the lower quarters and that section of wall built, then the next lower quarter was removed, after which the two upper quarters in succession. A part of this, as already stated, could be done without air, but for much of the work air under pressure of from 10 to 20 pounds, or even more, was required.

Before starting to sink the tubes grillages were sunk into the trench, and spaced so as to form a bearing and support for the adjacent ends of the tubes. These grillages were formed of 12-inch beams, and were carried on spuds or spurs that were driven into the bottom. They were lowered into place and then tapped with a pile driver until they were slightly below the level that the bottom of the tubes was to occupy.

For floating the different sections of tubing down the river bulk-heads had been built into each end before the launching from the ways, and every alternate tube was fitted with pressure bulk-heads capable of sustaining the pressure due to the head of water. They were towed to location and valves in the two ends were opened and water admitted. As they filled, the water naturally accumulated at one end more than at the other, and that end settled the faster. The tubes were prevented from up-ending by semi-bulkheads built down from the tops of the tubes into the interior, as indicated on the sketch. Then, as the tubes tilted air pockets were formed in the lower ends, adding to the buoyancy at that point and maintaining an equilibrium. Independent air cylinders were placed on top, so as to keep the whole system on the surface when the tubes had been entirely filled. The balance was very even and the whole was so slightly lighter than the water that it would have floated with only these auxiliary air cylinders just above the surface. The second sinking was done by lowering a grillage of beams or counterweights down on top of the tubes by means of a floating derrick. As the supporting ropes for this were eased off the weight depressed the tubes, and as they were tautened they came up. The weight so supported was about seven tons, so that by carrying a portion of this seven tons on the hoisting ropes, the whole 550 tons in water or 975 tons in air of tubes were fully controlled. The levelling and alignment of the tubes was done by means of masts rising above the surface and by transits and levels on the shore.



Section of Completed Detroit River Tunnel.

As already stated, the supporting grillage at the bottom was driven down to a level slightly below that of the bottom of the tubes. When the latter were lowered to place, a diver was sent down, who placed wedges on the grillage, by which a proper footing for the tubes was formed. The latter were supported at or near the ends only, and so accurate was the levelling of this whole piece of work done that there was no perceptible variation from true from one end of the tunnel to the other.

The alignment was, if anything, an even simpler matter than the levelling. Four heavy projecting pins were fastened into one end of the tubes. At the other end corresponding holes were formed. Then a line was led out from the tube already down and into the one being sunk. As the tube went down this line was overhauled, drawing the tubes together, until the pins on one entered the dowel holes on the other, when the two were drawn forcibly together. This set one end of the new tube in true and perfect alignment, and it was merely necessary to shift the easily handled outer end of the fresh one into line and the work was done.

With the tubes down, the first step was to place the connecting bolts through the flanges, and this was done by divers, and involved the only use of compressed air in the subaqueous section. This was easy and quick work, although the men were working in deep water. With the tubes down and bolted, it was necessary to embed them in their shell of concrete before removing the water for the inside lining. The tubes were carried on the grillage at the ends only; they were clear of the bottom of the trench throughout the central portion and there was a clear space below them at the grillage at the ends. The concrete was deposited through a long chute from a tremie scow. As a matter of fact, the pressure of the superincumbent water was such that the concrete was very well compacted, and cores taken at a distance from the point of delivery showed that it was fully as dense and strong as that formed in the air, while in the immediate vicinity of the delivery chute, where it was subjected to the direct head of the mixture reaching to above the surface of the water, it was exceedingly hard and was some 50 per cent. stronger than the air-formed concrete. Owing to the depth of water and the improbability of interfering with navigation, coupled to the desirability of keeping the approach grades down as low as possible, the top of the tunnel is in some places above the natural bottom of the river. It is protected at such points by rip-rap, so that no anchor grappling it could possibly do any damage.

The forming of the concrete about the tunnels was controlled by the tremie scows. In the first place a concrete floor of 1-4-7½ mixture was spread beneath the tubes. The excavation had sloping sides and the bottom was readily accessible. The floor A (see view of completed section herewith) was thus formed up to the bottom of the tubes. This firmly supported the tubes from end to end. Three tremies were then set to work to fill in and build up the concrete around the steel tubes. The sheathing at the sides, which had been built about the tubes before their launching from the ways, served as the outer forms and the steel tubes as the core. One chute came down just inside the sheathing and one between the tubes, or at the points B, C and D. The concrete was sent down very wet so that it would flow and find its own level, and the chutes were raised as the space filled up. This formed a block of concrete of practically rectangular section with the two tubes running through it. The space between the sheathing and the slope of the banks was then refilled with clay, so that the tunnel stands embedded in the bottom.

With the concrete laid there was thus a column of concrete laid out into the river, abutting against the approach walls and capable of withstanding any end thrust to which it might be subjected. It was lined by the steel tubes and cut up into compartments by the diaphragms in the latter. Then, as the work advanced, a section of the tubing would be freed from water, the temporary bulkheads cut away and the workmen would advance into it and put up the inner lining, or tunnel proper, working in the usual manner with wooden forms and without using any compressed air. When the internal lining was placed a concrete mixing plant was erected on the shore at the head of the shaft, and the concrete sent down through a chute to cars on a temporary track in the tunnel. These cars were then hauled out to the point where the work was in progress. The mixture used was 1-2-4 and was formed of Portland cement with sand and fine gravel. The levelling of the tunnel was true, while the alignment was out but a fraction of an inch. The last tube dropped into place with exactly the calculated clearance between its end and the Windsor approach walls, which was about 18 inches.

As it stands, the tunnel is very dry. The steel tubes have served as a waterproofing and are tight. In the approach tunnels the minor leakages are drying of themselves, and in but one or two places will any attention be needed from the contractors. The novel method is, therefore, a success, and a similar plan is being used for one of the tunnels under the Chicago river, where a single section will be sung. Its success, too, is not limited to its engineering features, but touches the financial side of the question, for not only has the cost been more than $2,000,000 less to the railway company than any other type of construction would have been, but it has been a profitable undertaking to the contractors. In finish the section is one of the largest, if not the largest, subaqueous tunnels in existence. The conduit bench is large, roomy and with ample headroom. There is one upon each side and access is obtained by ladders set upon staggering at 50-foot intervals, so that the trackmen have an opportunity to seek refuge every 25 feet.

The track construction is permanent and has been tested in service and under observation for more than two years in the open and has been found to be satisfactory in every particular. It is formed by embedding short wooden ties measuring 36 by 11 by 8 inches in the concrete flooring and spiking the rails to them with the intervention of tie plates. The rail used will be 100-pound section.

Outside on the Detroit approach the value of the ground is such that the natural slope could not be used, so that vertical concrete retaining walls are resorted to. But in Windsor the work in the approach cut resembles more the finished product of an old and prosperous road that what we are accustomed to associate with a newly constructed line. The tendency of the clay to flow and the probability of trouble with a natural bank led to a complete drainage of the slopes. Drains are carried up at right angles to the track, and the whole slope has been sodded; then, at the bottom, there are the tile drains to carry off the water so that no trouble is anticipated, and when the tunnel is opened to the public it will present the finished appearance, in while and in detail, of an old and well-established line.

Concrete Piers Constructed on Shore and Floated to Place

Two reinforced concrete piers were recently built in the harbor of Genoa, Italy, in order to carry a light steel bridge of a grain unloading plant. Each reinforced pier, according to "Engineering," London, is 35 feet high and carries a masonry pier 19 feet high above water level. The piers are 13 feet 11 inches by 17 feet 3 inches in plan, and have a working chamber at the bottom, 5 feet 11 inches high, so that they could be sunk by pneumatic process. The walls vary in thickness with the depth, the maximum being 7 inches. They transfer the pressure on them to vertical beams, which in turn are stayed by the horizontal reinforced concrete struts running to the beams in the opposite wall. Beam and strut sizes are also reduced with the diminishing water pressure. The walls of the working chamber are of solid concrete, reinforced in both faces, 23.6 inches thick at the top and 7 inches at the bottom, where they are shod with a cutting edge of channels and angles. This cutting edge is secured to the concrete by straps placed at intervals, looped over the reinforcing bars in the concrete and riveted to the upturned legs of the channel. The piers were built on shore, floated to place and then sunk.

A solid granite spillway dam, 19 feet high and 215 feet long, across the Chicopee river at Three Rivers, Mass., was blown out last winter in order to remove interference with a new hydro-electric plant above it There were 169 drill holes, 16 feet deep, $3\frac{1}{2}$ inches in diameter at the top, $1\frac{1}{2}$-inch in diameter at the bottom, spaced 4 to 5 feet apart. About 11 pounds of Dupont 60 per cent. dynamite were used in each hole. Fourteen to sixteen holes were loaded and exploded simultaneously. A foreman, engineer, driller and helper did the work.

Vancouver building returns for eight months of the current year are $8,259,045, compared with $4,883,312 for the same period of 1909. The permits issued last month represented a value of $733,635, against $842,020 for August, 1909. The last figures show a small decrease for August, 1910, but conditions generally are excellent and building operations are keeping well up to the mark

The building record for the current year at London, Ont., is slightly lower than that of 1909. Last month 81 permits were issued, representing a value of $40,705. In August, 1909, 59 permits were issued for buildings estimated to cost $61,137. For the eight months of 1909 and 1910 the figures were $695,734 and $530,871 respectively.

At Prince Albert, Sask., the building permits last month represented a total value of $212,720, as compared with $32,000 for August, 1909. Trade conditions are reported to be exceptionally good and quite a building boom is anticipated for next season.

Trade News from Winnipeg

Building Still Active—Current Prices of Principal Materials Interesting Comparison with Vancouver Rates

Winnipeg, Sept. 11, 1910.

August, accounted a slow month in building circles as far as new business is concerned, kept pace with the previous months of the year in this city. When the month's records were totalled, new buildings showed an aggregate cost of $1,119,100, or a total value for the first eight months of the year of $12,329,400. The volume of plans for new structures seem inexhaustible. The expectation is now expressed that the fifteen million dollar mark will be exceeded before the close of the year.

Coincident with the immense activity of this year it is remarkable to note that prices of material have experienced but a very slight increase. When compared with the figures obtaining in other western centres, they appear very reasonable. Winnipeg dealers who read in a recent issue of the "Contract Record" a list of the Vancouver rates, have asked your correspondent here to prepare a comparative table of the chief requirements of the supply trade. In almost everything the prairie capital undersells by a substantial margin the houses of the west coast.

The following table, which is not perhaps complete in detail, is fair evidence of the discrepancies:

	Winnipeg.	Vancouver.
Building paper, tarred, per roll .	$0.70	$0.90
Building paper, plain, per roll ...	.60	.70
Bricks, common, per M.	11.00	13.00
Bricks, pressed, per M..........	$23 to 50.00	$40 to 62.00
Cement, per barrel	2.40	3.10
Lime, per barrel	1.60	1.35
Sewer pipe, 4-inch, per foot	.10½	.18
Sewer pipe, 6-inch, per foot	.16½	.33
Plaster of paris, per ton	13.00	18.50
Putty, per pound	.03	.05
Tar, per barrel	5.00	8.50
Hard wall plaster, per ton	12.50	17.50
Nails, base	3.10	3.25
Hair fibre, per ton	13.00	18.00
Fire clay, per ton	20.00	20.00
Expanded metal lath, per sq. yd.	.16	.27
Hexagon floor tiling, per sq. ft...	.50	.55
Wall tiling, per square yard....	.50	.60

This list of prices the supply men show to prove that there has been no attempt to take advantage of the demands by raising prices. The stocks carried have been heavy in every line. Even during the most pressing period there was nothing which might be called a shortage.

In view of the fact that this year's operations are almost twice as large as last, the foresight of the supply men in providing against a shortage or famine is commendable. The whole market was anticipated and now without any dead stock on their hands, the supply houses are placing orders for material to be used in winter building. If the season turns out as well as last year, when we had such a mild winter, it is intended to do a great deal of house building. This will be an innovation in Winnipeg, as last year was the first time such work was attempted, and then it was only on a very small number of blocks which were behind contract time. This winter it is anticipated work on frame structures will be carried right through, giving an early impetus to the regular season, which opens in March.

A measure that will have the effect of producing more high class fireproof buildings is the extension of the first fire limits which will take place with the installation of the additional high pressure fire mains.

The weight of the dry matter in a cubic foot of wet mud of the density to be expected at the bottom of a reservoir was determined by the engineers of the Tallahatchie Drainage District, Mass., in connection with their investigations of the probable sedimentation in the reservoirs that may be constructed in the district. Two sections, 8 inches long, of 3½-inch wrought iron pipe, were turned on a lathe to a cylinder bore inside, were milled at the ends, bevelled outside at one end, and carefully measured with calipers and scale. Each tube was pushed down into typical submerged mud, struck at the ends and the contents then washed out into an iron vessel, which had been first heated to drive off moisture, and then weighed. The vessel was then heated until all moisture had been driven off, and again weighed. By several such determinations it was ascertained that 1 cubic foot of wet mud such as was tested contains 60 pounds of dry matter, and "parts by weight" of sediment can be readily reduced to cubic yards of wet mud which would deposit in a reservoir, provided the column of water passing be known.

Advantages of Reinforced Concrete Chimneys

At a recent meeting of the Concrete Institute, of London, Eng., a paper on "Reinforced Concrete Chimney Construction" was read by Mr. Ernest R. Matthews, borough engineer of Bridlington. He commenced by remarking that during the past seven years one firm alone—the Weber Company, of Chicago—had erected nearly a thousands such chimneys in America, under the direction of some of the most able engineers and architects in that continent. The advantages of using reinforced concrete in chimney construction were stated to be : (a) Economy in cost.—It had been found in America that reinforced concrete chimneys could be built by a well-organized firm at less than one-half the cost of a brick shaft. (b) Saving of space.—In a shaft 300 feet in height, for example, the brickwork at the base, according to the building regulations of the English cities and boroughs, would be about 4 feet 10 inches, whereas the thickness of the walls at the base of a reinforced concrete chimney would probably be as follows: outer wall, 9 inches; inner walls, 5 inches; with a space of 4 inches between the two walls. (c) Less weight than brick shaft.—A matter of the greatest importance where a treacherous soil had to be built upon. (d) Stability.—Reinforced concrete chimneys had been erected in the United States for some years past, and the author knew of only one failure. (e) Freedom from repairs.—Once erected, reinforced concrete chimney shafts required practically no repairs. (f) Rapidity of execution of work.—This was well known; a reinforced concrete chimney could be erected in half the time that it took to build a brick shaft. Particulars were then given as to typical examples of reinforced concrete chimneys in Great Britain and in America.

According to reports received by the C. P. R., the western wheat crop will be a great deal better than has been anticipated. Late estimates indicate that the wheat crop will amount to between 90,000,000 and 100,000,000 bushels. This is a very fair return, and should help to insure satisfactory business conditions for another year.

Architectural Possibilities of the West

Rapid Development of Winnipeg and Other Western Cities a Stimulus to Professional Ambition—The Question of Materials and Labor*

By S. Frank Peters, Winnipeg.

It seems to me that the first point to be observed in connection with the architecture of the West is the vastness of its extent as well as the varied character accompanying it.

Doubtless many present have come west of the Great Lakes for the first time, and they are just commencing to see for themselves the glorious vista spread out before them, and realize more fully than is possible from the study of either pen, pencil or brush sketches, the grand opportunities of the architect in the preparation of suitable designs of all classes of buildings for the many millions of inhabitants who will yet dwell in the land.

To those of you who might possibly take a run further west or north on the occasion of this visit, the numerous villages and towns of but yesterday's growth will seem truly marvellous. With the continued growth of population this building up of such centres in the different sections must continue. In addition to the vast extent of the growth, it must be borne in mind that the class of settlers is very superior to that usually found in the settlement of new countries. This will materially affect the development of architecture in the West, and at the very commencement the class of buildings will be much better than would have been possible under less favorable conditions.

As we are all aware from trade and municipal returns, many of our western cities are establishing record growths. Commencing with Winnipeg, the "Gateway of the West," statistics have already shown a more rapid growth than even Chicago, the great internal metropolis of the United States, could ever claim. And it looks very much as though Vancouver on the coast is going to establish a similar record, to say nothing of the enormous development and possibilities of Port Arthur and Fort William at the head of the lakes.

It is unnecessary, I think, to describe the class of habitations of early days—the Indian tepees, the mud huts and log houses of the early settlers, the shacks of the railroad contractors and prospectors, and gradually trace them in their different stages, excepting that a reference to the old Hudson's Bay posts are always interesting. One known as Fort Garry, which used to stand where our main street now runs, near the junction of the Assiniboine and Red rivers, was a most interesting piece of good old masonry, built by clever Scotchmen who knew more of good masonry than all the labor unions put together. The post known as Lower Fort Garry, about 27 miles down the river, still remains, and it is to be hoped that it will be preserved.

Next to the vast extent of our field for labor in connection with the architecture of the West, is the necessity of looking out for suitable materials with which to erect and furnish our structures. At present even material of ordinary use in vast sections of our country in the West is being imported from foreign countries, or at least freighted enormous distances. That this condition of affairs will continue is impossible, as it is not consistent with the spirit of the West. Investigation from day to day proves that western Canada will be able to supply material of all kinds that may be necessary for the construction of the largest and most costly buildings. Following the development of material will come the permanent residence of many new and well qualified mechanics and artisans, who are already arriving in large numbers.

It might not be out of place here to refer to the importance in western building work of care in our foundations. In many localities the sub-soils are deceptive. In addition to the usual enquiries, most thorough tests should always be made, particularly for the larger buildings, so as to avoid the unsatisfactory distinction of having "leaning towers of Pisa" as a result. Wind pressure is also a most important factor to consider, as with the wide sweep of prairie comes also the strong and steady wind pressure against which due provision must always be made.

As regards the style of architecture of the West, it must, of course, be based on classic and ecclesiastical lines, the foundation of all good work in our public structures, as well as in our domestic architecture. This will undoubtedly be secured as the result of the efforts that are now being made to provide suitable education and opportunities for the student, both by the Governments and by the architectural associations.

Importance of Town Planning

Another point to which I would like to refer, as it is most intimately connected with architectural designing, is the importance of town planning, the laying out of parks and other great centres of attraction. There is no doubt that it is most important for every municipality to set to work at the start to establish definite lines on which to build, by engaging experts in that line of work, after careful consideration by the best business men of the community. What is a magnificent pile of buildings without suitable and well laid out grounds and approaches, so that the impressions of the mass itself may be adequately improved by the surroundings, and so that the surrounding areas may be properly appreciated from the site itself.

I cannot help expressing my regret that there is such a tendency amongst the business men of our communities to copy the sky-scraper kind of building for office purposes, a type which is so often of such unsightly shape and proportions. No doubt such buildings may prove financially successful to the unfortunate owner who is allowed to erect them, but I believe the beauty of our city would be greatly enhanced if a reasonable limit were placed upon the height of these structures. In the most beautiful capitals of Europe the sky-scraper is practically unknown. And who will think of comparing the sky-line of New York, for instance, with many of the beautiful cities of the Continent? New York has a style of its own and it may be that the sky-scraper is a necessity in that city, but I believe there are a great many wise men living in New York who hold the opposite opinion. Be this as it may, surely such a style is totally unnecessary in Winnipeg and other western cities, surrounded as they are by boundless prairie where there can be no necessity for cooping up a mass of hard workers within such a restricted area.

A most important point in connection with our subject is the training of the rising generation on artistic lines in conjunction with regular practical work.

"Sky-Scraper" Architecture Not the Best for Canada

It is also to be hoped that in the erection of the many large and important buildings that will be required in the development of the West, proper efforts will be made to secure suitable designs by fair and honorable competition. Our public men should realize that meritorious designs for all large public buildings no matter to which class they belong can only be secured by engaging the best talent in the land. Where such is not secured directly, a competition should be held so as to afford an opportunity to our best architects. This would result in the advancement of architecture not only in the west, but throughout the entire country, and it would mean the ultimate erection of public buildings which will be a credit to the designer and a standing monument to the wisdom of the citizens.

---

* Extract of paper read at [illegible] Annual Convention Royal Architectural Institute of Canada, Winnipeg, Aug. [illegible]

Federal buildings in the different provinces, as well as Provincial structures, should be carried out on these lines, in conjunction with the department, whose chief architect should be called in as consulting or even supervising architect also.

To sum up, it seems to me that it would be much preferable for us to take our ideas from the world at large, and not adopt too hastily the style set by our neighbors to the south, much as there is to admire in their work. Let us assist in establishing a Canadian architecture which shall be in close sympathy with that of the mother land, and so help to perpetuate an architecture that shall be known throughout the world as British, holding the same relative position in future generations to that of Rome and Greece in the olden days.

Building Operations Booming in Sidney, N.S.

Sydney, N.S., is at present enjoying quite a boom in the building trades. Last year was marked by the greatest activity in this line since 1903. In 1909 there was an advance in the amount of money expended in building operations of $95,000 over that of 1908. This record has been completely eclipsed in 1910.

With only eight months of the present year passed, the people of Sydney have already taken out permits for building, valued at $272,071, an amount $12,000 greater than the entire amount expended during 1909 and more than two and one-half times larger than that for 1908.

How much the record will be better before the close of the present year cannot, of course, be closely estimated, but it is to be judged that the betterment will be extensive from the fact that during the last four months of 1909 more than one-third of the entire year's work was done. A statistical comparison of the total for the past six years will express the situation in very striking style:

1904	$127,595	1907	$ 87,175
1905	118,800	1908	65,615
1906	118,425	1909	160,470

1910, eight months $272,071

The trouble between the Winnipeg Builders' Exchange and the International Union of Bricklayers and Masons has broken out again. It appears that Geeves, the union representative who signed the agreement, afterwards received a telegram from headquarters at Indianapolis refusing to sanction his entering into any agreement with the Exchange. Consequently orders were issued by Geeves for the twelve men working on the Lyall-Mitchell contracts at Winnipeg to cease work. At this writing a general lock-out has not been enforced by the contractors.

The Silliker Car Company, Limited, of Halifax, N.S., have just issued a splendidly illustrated catalogue, termed "Catalogue No. 8," showing the many lines turned out in their woodworking department. High grade doors, sashes, mouldings and building materials of all kinds are fully illustrated, and give a contractor full information on all the lines handled in that department.

Personal News and Notes

Mr. G. R. Harper, architect, of Toronto, died suddenly last week at the age of 67 years.

Mr. Jas. Shillinglaw, for many years one of Brandon's leading contractors, and the father of W. H. Shillinglaw, formerly city engineer of Brandon, died last week in his 78th year.

Mr. W. H. Lackie, district superintendent for the Barber Asphalt Company, Buffalo, died last week in Buffalo. The late Mr. Lackie was well known in municipal contracting circles. He was 37 years of age and a native of Toronto.

Building permits issued at Toronto from January 1 to August 31, 1910, are valued at $13,486,973. The total for the corresponding period of 1909 was $12,018,812. The respective totals for August, 1909, and August, 1910, are $1,335,332 and $1,713,040.

A dispute over ten or twelve items in an account rendered by Mr. Patrick McGovern, the Boston contractor, to the city of Montreal, has lead to his taking an action for $12,326. He was engaged to construct a conduit for the city this year, and the city disputed several items in his account when it was furnished.

Mr. C. A. D'Abbedie, chief engineer for Messrs. M. P. & J. T. Davis, contractors for the substructure of the Quebec bridge, does not anticipate any delay by reason of the removal of the caisson. He states that the caisson is as good. to-day as when it was launched and that the work will be pushed ahead as usual next spring.

It is stated that owing largely to the scarcity of labor and the deadlock that has arisen between the G.T.P. and the B. C. Government upon the question of Oriental labor, the completion of the extensive Mountain section of the system may be delayed a couple of years. It is almost a foregone conclusion that when the contract for the work is awarded it will go to Foley, Welsh & Stewart, who are building all the other portions of the line from Edmonton to the coast.

Seven firms are understood to be tendering for the superstructure of the Quebec bridge, bids for which will be received up to October 1st. The Canadian concerns are the Dominion Bridge Company, Montreal, and the Canadian Bridge Company, Walkerville. Tenders are also expected from the McClintock-Marshall Company, of Pittsburg; the Phoenix Bridge Company, of Philadelphia; the American Bridge Company, of Ambridge, Pa.; the Cleveland Bridge Company, of Darlington, England, and a German company.

The death occurred last week at Victoria, B.C., of Mr. Jas. Rebbeck, who had been residing at the coast for nearly 20 years. The late Mr. Rebbeck was a native of England and was a consulting engineer of wide experience, having seen service in many parts of the world before coming to this country. For some years he was assistant manager for the B. C. Iron Works, Vancouver. Later he accepted a similar position with the Albion Iron Works, Victoria, B.C. Six years ago he established himself at Victoria as a consulting engineer.

1909 was a prosperous year for the plaster business in Hants County, N.S., which is the centre of big operations along this line. About 250,000 tons is the estimated amount shipped from Windsor, valued at $265,000. Of that amount 150,000 tons were handled by the Wentworth Gypsum Company. The Newport Mixing & Manufacturing Company, Windsor, which opened up extensive quarries at Avondale, shipped 24,000 tons. From other points in Hants County a quantity of crude gypsum has also been shipped to the American market. Those handling shipments were: T. A. Mosher, Windsor, quarries at Newport; M. Parsons, quarries at Mapleton; A. Parsons, Walton, and O'Brien Bros., Noel, N.S.

Railroad Construction and Current Topics

Norwegian Consul's Serious Allegation Concerning Treatment of Laborers—Extensive Development Work in Sight — Seven Thousand Miles in Next Five Years

Railway contractors in this country will be well advised to look into the action of Mr. Arvid Jacobson, the Norwegian consul in Montreal, in warning his countrymen against coming to Canada to engage in railroad construction. Certainly the statements made by Mr. Jacobson, who claims that Canadian railway contractors are both inhuman and unfair to their men, will not tend to improve the already unsatisfactory condition of the labor market.

Mr. Jacobson stated that the number of men employed in Canadian railway construction, according to official statistics, averages 35,000. About 150 of these are killed by dynamite explosions or other accident, while probably a greater number died in the hospitals as a result of injuries received by exposure or otherwise. Among the men on the road there were probably between two and three thousand Norwegians, and a similar number of Swedes and other Scandinavians. Most of the men from Scandinavian countries were employed in dangerous work — the handling of dynamite and mining of rocks.

Regarding deaths and accidents in the course of construction work in Canada, he says that experience shows it is practically impossible to obtain information of deaths occurring on construction work, caused by accidents or otherwise, and that it is also practically impossible to get any exact and reliable information of the name, nationality and home of the victims. The property left by men who are killed on such work or who die in the hospitals often disappears, and it is impossible for the relatives to take action and claim damages, which they most certainly should be entitled to in special cases, according to the various provincial laws regarding compensation to the relatives of laborers killed or injured.

Wages due the deceased often remain on the books, and deposits made in the banks remain as unclaimed. The article further states that the matter has been brought by the Consul-General in Montreal before the Canadian authorities, who have paid little or no attention to it.

Canada's Great Railway Development

Contracts let and engagements entered into with the Dominion and Provincial Governments by the various Canadian railway companies, indicate that at least 7,000 miles of new railroads will be built during the next five years.

The construction for the present year is 1,500 miles, about the same as last year. The largest increase in mileage will be in British Columbia. The construction of the National Transcontinental—better known as the Grand Trunk Pacific—from Moncton on the Atlantic to Prince Rupert on the Pacific, 3,550 miles, is more than half completed. On the eastern part of this line from Moncton to Winnipeg, being built by the Dominion Government, out of the 1,804 miles, 742 miles are graded. The Quebec bridge, now being reconstructed over the St. Lawrence, is part of this system. Of the 1,746 miles from Winnipeg to Prince Rupert, 915 miles are completed, and trains are being operated between Winnipeg and Edmonton. From Prince Rupert the contract for 200 miles east has been let, and the track is being laid on the first 100 miles. The remaining 500 miles to Edmonton will be under construction this year.

The subsidiary Grand Trunk Pacific Lines Company has just placed on the British market an issue of $6,000,000 4 per cent bonds, guaranteed by the province, for the construction of branch lines in Saskatchewan as follows: Regina to international boundary line near Portal, 155 miles; Regina to Moose Jaw, 110 miles; from Biggar southwesterly, 50 miles; Prince Albert branch, 110 miles; and Cut Knife branch, 50 miles.

Under an agreement with the Alberta Government, a company has undertaken to build 600 miles of line in that province, and has started the construction from Tofield to Calgary. In the eastern provinces, the Canadian Northern Ontario has under construction 100 miles from Toronto to Trenton, as the first section of its line to Ottawa. It is expected that contracts will be placed during the year for the balance of the line, and also for the grading of the line from Toronto to Buffalo, along the Toronto-Niagara Power Company's right of way.

The construction under way by the Canadian Pacific during the current year includes a second track between Winnipeg and Portage La Prairie, and 459 miles on six different branch lines in Manitoba, Saskatchewan, Alberta and British Columbia. The Dominion Government has provided funds for making a start on the 600-mile line from Pas Mission to Hudson Bay, from Prince Albert to Fort Churchill. Another line known as the Hudson Bay & Pacific Railway is contemplated in the near future. The Great Northern of Canada has a large mileage surveyed for construction, but the only point now where active work is being done is between Abbotsford and Hope, in British Columbia. In Newfoundland the Reid Newfoundland has agreed with the Government to construct 280 miles of branch lines at the rate of 50 miles a year.

For the purpose of construction, rails and fastenings are to be admitted duty free, also the material for the construction of rolling stock. The immense amount of railway construction which is being done in Canada, in proportion to its population, will be more fully realized in the fact that during the year 1909, according to the official returns of the various railway companies, Canada constructed 1,588 miles in new lines of railroads.

According to reports from Cochrane, Ont., Foley, Welsh & Stewart, contractors for the National Transcontinental Railway, have been meeting with considerable difficulty in crossing a muskeg near Low Bush river, 30 miles east of Cochrane. One of their locomotives was overturned and party submerged in the soft earth. They have ceased laying rails in the effort to fill the morass. Fauquier Brothers, however, are laying about a mile of track a day west of Cochrane and considerable activity is being shown in the erection of bridges along the line in that vicinity.

The Department of Railways is having a survey made to determine the cost of enlarging the Welland Canal, and it is expected that before Parliament meets the work will be completed. A rough estimate fixed the cost of making a 21-foot passage at $50,000,000, which is about half what the Georgian Bay Canal is estimated to cost. However, it is pointed out that as the enlargement of the Welland Canal would have to be followed by the enlargement of the whole system of St. Lawrence canals, the cost of improving the Welland route might be greater than the Georgian Bay Canal.

Messrs. Gould & Champney, architects, of Seattle, have opened a branch office at Vancouver in charge of Mr. Albert Wood.

The Second International Road Congress

Interesting Conclusions Reached Last Month at Brussels—Pertaining to the More Important Phases of Road Construction and Maintenance

One of the most important features of the Second International Road Congress at Brussels was the conclusions reached by the various sections regarding phases of road construction and maintenance. These sections considered the following subjects: (1) metalled and paved roads; (2) foundation and drainage of road; (3) light railways and tramways; (4) cleaning and watering; (5) choice of surfacing; (6) distribution systems under roads; (7) influence of weight and speed of vehicles on bridges; (8) design of road vehicles. While the conclusions do not bring out much that is new, yet they express in concrete form ideas which formerly in many cases have been held but vaguely

Metalled and Paved Roads

Use of Binding Materials in the Construction of Metalled Roads—The Congress believes that it is desirable to pursue and develop the applications of the use of binding materials in the construction of metalled roadways, special attention being given:

(1) To determine in each case the character of the binder best suited to local conditions.

(2) To determine as exactly as possible the physical and chemical characteristics to be specified for tar, bituminous, asphaltic or other binders as best suited.

(3) To compare the different results obtained in various methods of construction.

(4) To investigate the influence that storing of tarred metal during a more or less extended period, before being used, may have upon the perfection of the work.

(5) To make a study of the deteriorations that the materials are subjected to during use.

(6) To specify the system to be advised where ordinary metalling has proved deficient and stone paving cannot for some reason be applied.

(7) To establish for each district, according to local conditions and in each case the relation between cost and the result obtained.

Use of Trackways in Paved Roads—(a) Apart from exceptional cases depending upon local conditions, the construction of trackways in paved roadways can be considered but an expedient.

Progress made in Combating Wear and Dust—Confirming the resolutions passed at the Paris Congress in 1908, the Congress believes:

(1) That superficial tarring may be considered as definitely accepted in practice, and that the advantage to be derived from spreading fine sand or suitable stony material after tarring and rolling the same is not at present proved, and should form the object of comparative tests.

(2) That in the future application of these methods the attention of road builders could be drawn with benefit to the comparison of results obtained by the laying of tar, bituminous or asphaltic substances—hot or cold—by machine or by hand, both from the point of view of cost and from the point of view of the efficiency of the operation.

(3) That it is desirable, in comparing results, to take into account the quantity of the materials composing the metalling, the intensity of traffic and tonnage, as well as the climate.

(4) That with due regard to the resources of each region in tar, bituminous or asphaltic substances, it is important to specify in contracts the conditions that are to be fulfilled, especially as regards the preservation of "life"; that is to say, the property of preserving the binding power.

(5) That it would be desirable that a comparison be established between the advantages of tarring—this word being taken in its broadest sense—in different cases; whether the operations are to be frequently repeated, small doses being applied each time, or whether larger quantities are to be applied at greater intervals. Furthermore, whether, in the metalling itself, a tar, bituminous or asphaltic binding material has already been incorporated or not.

(6) That the conclusion adopted by the first Congress is to be maintained in toto, running as follows: emulsions of tar or of oil, hydroscopic salts, etc., have a real but not a lasting efficiency. Therefore their use should be limited to special circumstances, such as on race-courses, and in connection with festivals, processions, etc.

Foundation and Drainage of Roads

Foundation—(1) The formation and construction of foundations of roadways should be made the stronger in proportion to the lesser compactness of the ground. The foundation should have more body and resistance the more it is exposed to internal deterioration and external wear.

(2) In the choice of the system of foundation for roadway, both stone sett and metalled, stress should be principally laid on the degree of dryness and dampness of the subsoil, while having regard to the possibility of their drainage and to their geological nature and to the nature of the materials of the locality.

Drainage—(3) In soils where preliminary drainage is required before construction the general methods of drainage should be applied to the whole or to a part of the road body and to the bed of the metal if necessary.

(4) The cross and longitudinal sections of roads and those of side gutters should be established so as to facilitate the flow of the trickling water and to prevent infiltration of water into road surfaces, which should be made as impermeable as possible.

The evaporation of superficial dampness should be encouraged by every means.

(5) The works for the foundation and for drainage should be carried out simply and economically, and by using the materials of the country so far as possible.

Light Railways and Tramways.

(1) In the study of the new roads to be constructed both in the neighborhood of large towns as well as in the open country it may be useful to try to provide a sufficient road width for the construction of a light railway outside the roadway.

The designs should be of such a kind as to provide for every kind of traffic.

It is desirable that the supplementary costs should be defrayed by the owners of the light railway as far as the part of the road reserved for the rail track is concerned.

(2) The construction of sunken rails in the metalled roadways is always harmful to the viability of roads, and there results a marked increase in cost of the maintenance. It is desirable that this method should be avoided as much as possible.

The presence of tramway rails in paved roads makes the repair of the paving very difficult where the latter abuts against the rails. It is necessary to diminish that nuisance as far as possible by appropriate methods.

(3) Where the railway is placed by the side of the road it is preferable, where the width of the road permits, to construct it on a special track, inaccessible to wheeled traffic and super-elevated in order to allow greater safety.

It is necessary in all cases to provide proper drainage.

In the case of metalled roadways, the owners of the railway should be obliged to construct on the outside border of the roadside a depot for materials for the repair of the road; the same obligation should be in some cases extended to paved roads.

(4) The removal of trees along roadsides should not be tolerated unless in special cases.

If the width between the tree rows is insufficient for the rail track to give the necessary width for ordinary wheel traffic the track should be laid on the outside of the trees.

(5) It is desirable that the owners of light railways should assist the work of maintaining the area of the road or roadway occupied by the rails or contiguous to same or pay the costs of this maintenance.

Cleaning and Watering

Throwing refuse upon the public roads should be carefully avoided. Such refuse should be removed by the municipality and not by the owners of adjoining property provided the cost of this work is recovered from the latter.

In large towns it is necessary to give special care to cleaning and watering.

Cleaning should be done as rapidly as possible.

Watering must be frequent and limited in amount according to local conditions.

Washing and sweeping should be done as early as possible. Mechanical processes are particularly recommended.

Improvement in the implements should be sought for with a view of ensuring the most complete cleaning with the least inconvenience to the public.

Motor machines can be advantageously used for cleaning and road watering in large towns.

Choice of Surfacing Materials

(1) Macadam causes dust and mud, is expensive to maintain, and is suitable in large cities only for streets where the traffic is not very great or heavy.

(2) The experimental work carried out in recent years with macadam improved by using a bituminous or tarry coating or binder must be continued in order to determine the best methods of utilizing this kind of construction under varying conditions, so that this question may be submitted again at the next conference.

(3) Stone pavement has great qualities of resistance and durability. Its maintenance is easy and economical; it produces hardly any dust, and is suitable where there are tramway tracks.

(4) It should be adopted in thoroughfares whenever noise is of little consequence or when wood or asphalt surfaces are not suitable. It should consist of setts regular in shape, durable, but not slippery, wearing evenly, and laid upon a foundation and with close joints.

(5) The Congress desires to see the trials of small sett pavements continued wherever local circumstances and traffic conditions permit.

(6) Wood paving is noiseless; not slippery if kept clean; it stands very heavy traffic. The use of it should be extended even to thoroughfares through which run tramway lines.

(7) The respective advantages of soft and hard wood blocks must be a subject of discussion at a forthcoming Congress.

(8) Asphalt pavements should be recommended owing to their good qualities from the hygienic point of view and their ease of cleaning and of repair. This surfacing is almost noiseless and produces but little dust, but is unsatisfactory adjacent to tramway rails.

(9) There is opportunity for its use in fashionable thoroughfares where the traffic is not severe, where there are no tramways, and where the grades are very moderate.

(10) Finally, the trials of asphalt flag and block pavements should be continued.

Distribution Systems Under Roads

(1) It is desirable to free as far as possible the carriageways from the minor distribution systems of pipes which now encumber them and to leave in them only the large sewers and mains which require little attention.

(2) As far as possible the minor distribution pipes which are connected to the adjoining houses should be doubled and placed on both sides of the streets. This doubling is especially recommended for streets with heavy traffic and also for those where the surface rests on a solid foundation.

(3) It is advisable to consider the advantages of placing all distribution systems except gas in subways of suitable dimensions under the footways. In this case great care must be taken to prevent flooding caused by breakage of water pipes.

(4) When the distribution works have been actually placed under the carriageway, the Congress advises that the system of doubling should be applied prudently by taking advantage of the opportunity given by considerable repairs or alterations.

(5) Complete agreement is necessary between all authorities interested in the streets in order to conduct their operations so as to interfere as little as possible with the traffic. It is most desirable that all street works should be under the general direction of those responsible for maintaining the surface. The work must be carried out as rapidly as possible, and so as to reduce the space occupied on the public highway and the obstruction to traffic.

(6) Trees planted in the footways in urban districts should be chosen so as not to inconvenience the frontagers by their leaves nor to interfere by their roots with the distribution systems.

Influence of Weight and Speed of Vehicles on Bridges, etc.

(1) The development of mechanical traffic has not had up to the present the effect of increasing the weight of vehicles generally beyond the limits recognized by regulations and custom in connection with constructional calculations. In any case it is desirable that when existing regulations are revised steps should be taken to test bridges by placing upon them the heaviest probable loads under the most unfavorable conditions and exclusively composed of mechanical vehicles.

(2) Under the present conditions of constructing motor vehicles and building public roads it does not seem possible that the speed of vehicles could have any effects on modern and well built bridges which have not already been duly taken into account in the usually adopted methods of calculations of strength. It may be advisable, however, when testing new bridges or re-testing bridges to make use of the heaviest motor-driven vehicles permitted to run, and running them at high speed.

(3) The consolidation (solidarization) of the different parts of which bridges are composed aids their capacity to withstand the effects of vehicular traffic.

Design of Road Vehicles

Animal-drawn Vehicles.—(1) Heavily loaded vehicles with narrow tires may cause exceptional damage to roads laid down for general traffic.

(2) It is desirable that trials should be taken in hand for the purpose of determining the relation which should exist between the load, the diameter of wheel, and the width of tread, so as to avoid abnormal damage.

Mechanically drawn Vehicles.—(1) Such automobiles as fall under the head of "touring cars" cannot cause abnormal damage to the roads so long as their speed is kept within limits.

(2) Public service automobiles cannot cause appreciable damage to the road provided that the maximum speed does not exceed 25 kilometres per hour; that the maximum axle-load does not reach four tons on the heaviest loaded axle.

(3) Commercial motors need not cause exceptional damage to a well constructed road provided that the following limits are adhered to: First type—vehicles in which the axle-load is less than 4½ tons; maximum speed, 16 kilometres per hour.

In the narrow streets in towns and large cities, when vibrations of the ground are to be feared, it is possible to minimize the inconvenience by reducing the speed in a suitable degree.

Second type—vehicles in which the maximum axle loads are between 4½ and 7 tons, and the maximum speed 12 kilometres per hour.

It is desirable that experiments should be taken in hand in order to determine the maximum width of the tires of all automobiles while still insuring that under normal conditions the distribution of the load on the ground should take place over the whole supporting area.

(4) Ribbed or grooved iron tires cause abnormal damage to the road no matter what their width or what load they support.

(5) Vehicles propelled by mechanical power cannot cause extraordinary damage to the curved portions of roads provided that at these points a sufficient super-elevation is given, and that the curved portion is not approached or traversed at an unreasonable speed.

(6) With a view to saving the roads it is desirable that car builders should go carefully into the question of clutches and brakes, so that the skidding of the wheels may be avoided, balance the motors as perfectly as possible, and allow a reasonable raising of the centre of gravity.

Road Construction in Ontario

The annual report issued by Mr. W. A. McLean, Provincial Engineer of Highways for Ontario, contains many items of interest.

Township expenditure in the twenty years, 1889-1908, has amounted to $19,015,343, and statute labor in 1908 was 1,141,976 days. Estimating statute labor at one dollar a day, this would be equal to a total outlay in twenty years on township roads alone of $30,435,103. The cash expenditure of townships has more than doubled since 1889, in which year it was $677,564; while in the year 1908 it amounted to $1,403,211. With statute labor at one dollar a day, the total township expenditure in 1908 had a value of $2,545,187.

Seventeen counties have taken advantage of the opportunities for road improvement given by the Act of 1901, which provides Government assistance to municipalities making improvements. Expenditure under the Act since 1902 has been $2,128,122.93.

Of this amount the counties have spent $1,418,748.63. The provincial expenditure, extending over eight years, has been $709,374.30, the province contributing one-third of the total, or one dollar to each two dollars raised by the counties. Combining the items of road construction and supervision (the latter about $75,000), the total cost of road construction is $1,404,497.88. With 1,125 miles of road built, the average cost per mile has been approximately $1,250. This, as previously stated, neglects a large amount of incomplete and scattered work, so that the average cost per mile would be less.

The fifth annual convention of the Union of Saskatchewan Municipalities will be held in Saskatoon Sept. 21st and 22nd. Particulars may be obtained of the secretary, Mr. J. Kelso Hunter, Regina.

Montreal Strike Settled

The bricklayers' and masons' strike at Montreal, which lasted more than two months, was settled last week. The agreement made by the Builders' Exchange and the International Union will remain in force until June 30th, 1912. An arbitration committee consisting of two representatives from each side will be appointed for the term of the agreement. Nine hours will constitute a day's work, and the rate of wages will be 50 cents an hour for bricklayers (sewer and conduit work 60 cents), and 45 cents an hour for stonemasons. Work on holidays will receive double pay, and overtime pay for work after five o'clock will be at the rate of time and a half. The agreement was signed by Messrs. E. G. Cape, of Byers & Anglin, and by J. H. Hutchison, of Jno. Heward & Company, for the Montreal Builders' Exchange.

Hon. G. P. Graham, Minister of Railways and Canals, turned the first sod last week in the construction of the Hudson Bay Railway. The ceremony was performed on the south shore of the River Saskatchewan near the approach of the bridge under contract by Mackenzie & Mann. It is probable that Fort Nelson will be the terminal point of the new railway. The construction of the bridge is in charge of R. W. Graham, who, during the summer, has done a great deal of bridge work and laid 600 miles of track for the Canadian Northern.

A defect was discovered in the new caisson for the north pillar of the Quebec bridge, according to a recent dispatch from Quebec, and it is probable that it will have to be removed to Roche's Cove and partly rebuilt, which will delay the completion of the bridge for about a year. It is stated that the contractors, Messrs. Davis, have received instructions from the Federal authorities to complete their work for the autumn of 1911. It was necessary to use 1,700 tons of timber in the construction of the caisson, and, after it was launched, ten feet of concrete were placed in it, which will have to be removed before the caisson will be placed in Roche's Cove. The loss is estimated at half a million dollars.

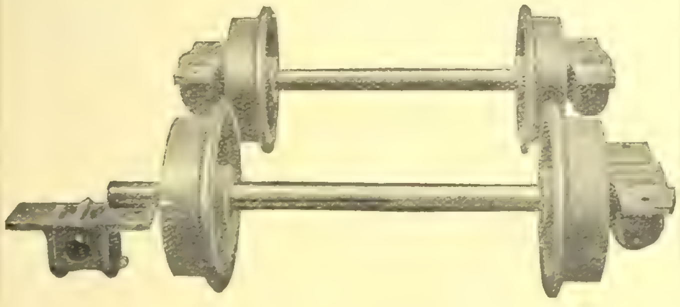
Controller Wanklyn and Alderman Lapointe, who represented the city of Montreal at the convention of the League of American Municipalities at St. Paul, Minn., were impressed particularly with the manner in which western American cities spend money on their parks and streets, and consider that Toronto and Montreal could learn much from them in this respect. Alderman Lapointe retired from the directorate of the League and was succeeded by Controller Ward, of Toronto, who was appointed 3rd vice-president. Next year the convention will be held at Atlanta, Ga.

Victoria, B.C. Making Steady Progress

The August building returns for Victoria, B.C., are $212,814. The total for the year to date shows an increase of about 25 per cent. over the corresponding period of 1909. The following table shows the monthly reports for 1910 and 1909 up to August:

January	$128,985	$ 78,080
February	151,760	122,630
March	244,760	121,642
April	182,440	188,060
May	257,290	188,620
June	227,600	90,121
July	222,290	372,120
August	212,814	141,040
Total (8 months)	$1,657,939	$1,302,360

Build Your Own Cars Using Our Irons



Your cars will cost you less, and will be built just to your liking.

We make a business of manufacturing car wheels, axles and boxes.

We employ expert, high-priced metallurgists to regulate the composition of iron in our wheels and get just the right chill.

We guarantee our car wheels to be strong, tough and well chilled, ensuring long service.

We make wheels any size, fit them to axles for any gauge track, and supply any style of box required.

Let us quote you.

Marsh & Henthorn, Limited

Makers of Hoisting Machinery **Belleville, Ont.**

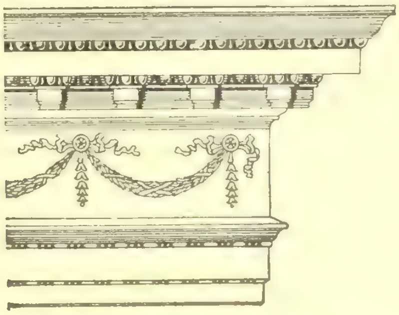
Sales Agents: MUSSENS LIMITED, Montreal

"A good appearance is a letter of recommendation [illegible] well built, a monument to the builder."

—The Philosopher of Metal Town

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.

They are made of sheet copper or galvanized steel and are absolutely rust proof.

"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.

Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers

1951

The Metallic Roofing Co. Limited

TORONTO & WINNIPEG

Scandinavia Belting

FOR TRANSMISSION AND CONVEYING

A 30" Extra Stout Scandinavia Belt in Operation Carrying Coal

A Solid-woven, Impregnated Textile belt.

Equally good in wet and dry places.

Not made in plies and will not come apart.

Made in three weights and in widths up to 60 inches.

WE GUARANTEE that this belt on a basis of price will give you better service than any belt on the market.

Write for Bulletin "A" and Discounts to

Federal Engineering & Supplies Limited

284 Yonge St. - TORONTO

Quebec Municipalities and Good Roads

At a luncheon of the directors of the Eastern Townships Exhibition at Montreal last week interesting reference was made to the good roads question by Hon. P. S. Mackenzie, Provincial Treasurer.

Mr. Mackenzie spoke of the good work the Government was doing in connection with the roads. There was an appropriation made every year for this. He regretted, however, that the municipalities of the Eastern Townships were not taking the advantage they ought of this grant. They seemed to be afraid to assume the responsibility of looking after the roads. In his own county of Richmond only two municipalities had taken advantage of the grant. He believed they did not thoroughly understand the provisions of the grant. Where a municipality spent a certain amount on macadamizing a roadway the Government would give half of the amount expended, but the municipality would have to maintain the road after it was made. He did not want them to think that he was foreshadowing any new legislation, but he believed that if the auto owner would contribute more in the way of a license, the money might be devoted towards the improvement of good roads. At the present time the owners of autos contributed $11,000 towards the finances of the province. He would do all in his power in the direction of improving the roads of the province.

Hon. Dr. Pelletier said he was always glad to do what he could towards the improvement of roads. The different municipalities in the county of Sherbrooke were taking up the grants given by the Government.

Street Improvement at Westmount, Que.

Good progress in street improvement work is being made at Westmount under the administration of City Engineer Fellowes. In 1903 and 1904 there were 13 miles of macadamized road, 2¼ miles of concrete walks, 16¼ miles of sewers, and half a mile of permanent crossings. There were in that year no bituminous macadamized roads or bitulithic. In 1909 the macadamized roads had increased to 20.21 miles, the concrete walks to 30 miles, the sewers to 21 miles, and the permanent crossings to 23 miles. The concrete gutters at the end of 1909 were 23 miles, the bituminous macadam road four-tenths of a mile, the asphalt one mile and the bitulithic three-tenths mile. Mr. Fellowes is experimenting this year in the construction of two or three miles of Tarvia treated roads, from which he anticipates excellent service. In the permanent paving of Westmount the Canadian Mineral Rubber Company, a Chicago concern, has secured the bulk of the contracts for asphalt construction.

Mr. Fellowes made a tour recently through Massachusetts and obtained some useful information on methods of dust laying, in which connection he is favorable to asphalt oil. An excellent system of underdraining roadways has been introduced at Westmount. Mr. Fellowes is enthusiastic over the good roads question and thinks that the Quebec Government should be awakened to a fuller sense of their responsibility in this matter.

Provisions of a "Sane and Safe Contract."

In an interesting paper dealing with the standardization of contract forms, read by Mr. R. W. Creuzbaur at a recent meeting of the National Association of Comptrollers, it was stated that "a sane and safe contract" should provide:

1. That a clear definition of all work and materials to be furnished by the bidder be carried consistently throughout the invitation to bidders, the form of contract, the bond and the contractors' proposal, all of which must agree in their general terms with the specific and detailed description of the specifications. Under this head we should also urge brevity and no repetition, except where the lawyers insist on repetitions in the legal forms.

2. That these definitions and descriptions of work and materials must provide in a unit price contract a clear distinction between all such items of work and materials which are to be paid for as classified under unit item bids and such uncertain and contingent work of miscellaneous nature as is to be supplied by the bidder without direct compensation; being carried or floated over the other item prices. To illustrate, sheeting and excavation in a sewer trench where a price is taken only for a sewer complete per linear foot, including all incidentals, is in the second class, i.e., items not directly bid for.

3. That provision be made by which extra work, unknown as to character or extent at the time a contract is made, may be ordered and paid for under such stipulations and reasonable control as may be just to both parties. This applies especially to public works of magnitude, where subsurface conditions and extent of foundation have not been fully exploited. In street work or work of a simple character the provision for such extras may be omitted.

4. That the contract should embody a clearly expressed provision for a uniform and fair valuation of all classes of work and materials to be paid for in partial or monthly payments, so as to protect the city from unbalanced bids and the necessity for financing a contractor to an unfair extent during the progress of the work where he had so adjusted his bid as to call for a large allowance on the first items of work to be done.

5. That a determination of the most favorable bid cannot be made in a unit price contract by taking only the gross sum without comparison of the prices of all the items, and figuring interest thereon, as compared with the interest to be carried by the city on the monthly allowances called for by payments on a balanced bid. In public works of magnitude, extending over several years, this question of the extent to which the city shall finance contractors is of great importance.

6. That, aside from the feature, unbalanced bids may operate to the disadvantage of the city in the event of variation in quantities anticipated and given in the engineer's preliminary estimate. Unbalanced bids and subsequent increases in quantities bid for at high prices and omissions in quantities bid for at low prices have constituted in the decision of the courts sufficient evidence of collusion and have rendered contracts void.

7. That where alternate methods of construction or substitution of materials are allowed under the contract, and where only one price has been established for each general classification of such work and material, the option in every case for the selection of the satisfactory alternate method of construction or character of material to be substituted, must be vested directly with the bidder, not only in the interest of economy, as better competition is so invited, but because otherwise we have "a specification which does not specify," affording a broad opportunity for the annulment of the contract by a taxpayer's action.

Calgary, Alta., is earning quite a reputation for fine paving. The excellence of its asphalt streets has attracted the attention of the Spokane Board of Trade according to the following extract from the Calgary Daily News:

> "Secretary Charles H. Webster of the Board of Trade has received a communication from the Spokane Board of Trade asking him for information regarding the different styles of paving used in Calgary, and how they have stood the wear and tear upon them. Mr. Webster has referred the matter to City Engineer Child, who will give the necessary information. The letter to Mr. Webster states that the writer had heard a lot of the well-paved condition of Calgary and the beautiful state the streets were always in from several Spokane people who had visited here at different times."

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

SAND AND GRAVEL

Lime Fire Clay Cement
Fire Brick Plaster Hair
Sewer Pipe Weeping Tile
Building and Crushed Stone

OUR PRICES ARE RIGHT AND OUR SERVICE GOOD

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North {664 665 Evenings, North {2107 658

Jas. Dickson, Pres. Geo. T. Dickson, Vice-Pres.

Dickson Bridge Works Co.
Limited

Campbellford, Ont.

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings
Roof Trusses

and other Structural Steel

Foundry and Machine Shop in connection.
Estimates on application

A Contractor's Pump

The Waterous

Split-Base

Centrifugal

A pump in which Simplicity, Strength, Durability and Campactness are combined. Which will not clog up, will run every minute of a ten hour day, and can be left to the care of an unskilled laborer, without going to pieces.

Built in horizontal and vertical types and designed to be belt, engine or motor driven. In all sizes, up to 14 inches discharge opening.

Write for Pump Bulletin No. 200

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited

White Integral Supports

for Furring Bars

Make the best and most economical ceilings.
Immediate delivery can be made. :: ::

Dominion Fireproofing Co.

EADIE-DOUGLAS, LTD., Sole Agents
12 University St., MONTREAL, CANADA

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

THE MILTON PRESSED BRICK Co. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance—it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

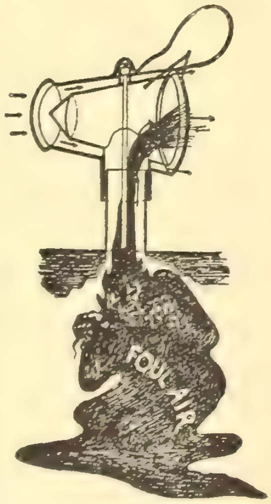
Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

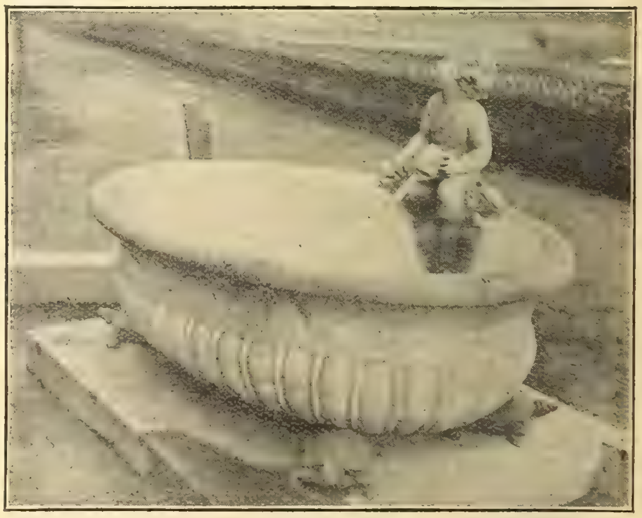
Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA:

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159



Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read The Cement Era. The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.
1800 Monadnock Block - - CHICAGO

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Sand & Supplies
LIMITED
Spadina Dock, Toronto

"Water-washed" and Gravel

Cement, Crushed Granite
Crushed Stone and
Sewer Pipe

M. 4507

Fall Contracts

Architects and contractors who are desirous of making or of keeping a good reputation will act in their own interests by specifying

Port Credit Brick

We have recently made extensive enlargements and improvements to our plant and have now one of the finest equipments in America.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 3516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES

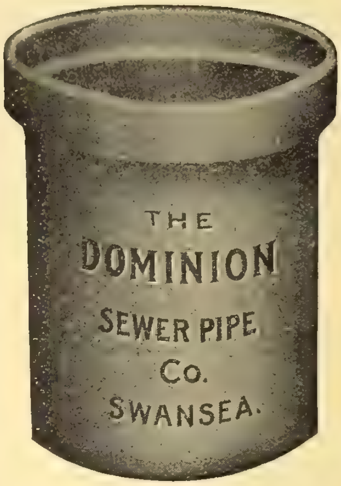
True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

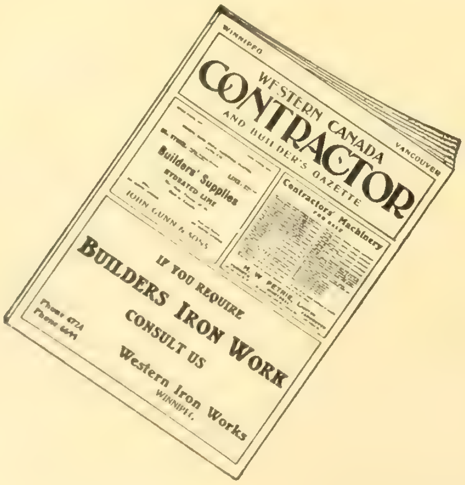
TELEPHONE (Toronto Connection)
PARK 1809



The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe

Single and Double Strength. Sizes 3" to 42"

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

J. H. NEW
President

RYLAND H. NEW
Vice-President

Are You Sure Your Sewer is Safe?

No matter how reliable the contractor who lays your sewers, if the pipe is in any way defective you positively cannot secure a satisfactory job. You are paying for first class goods, then why not see that

"Hamilton Salt Glazed Vitrified Sewer Pipe"

is specified. You then can be sure that your sewer will be safe, and that it will do the work that it is intended for.

We have proven our claims to others, why not to you?

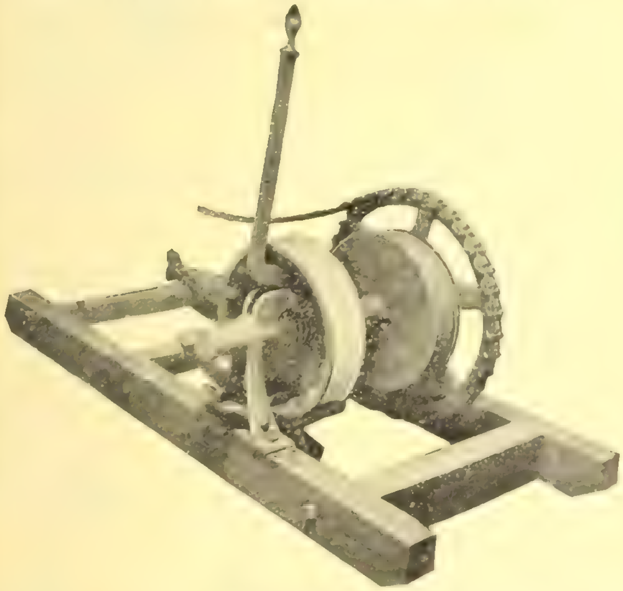
A trial order is all we ask

The Hamilton & Toronto Sewer Pipe Co., Limited

Telephone, Telegraph or Write us

Hamilton and Toronto

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

- Contractor's Work
- Bridge Building
- Mortar Conveying
- Sewer Building
- Well Digging
- Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited

Engineers and Machinists London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

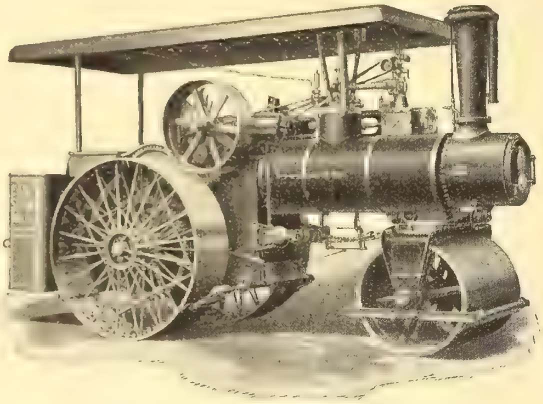
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

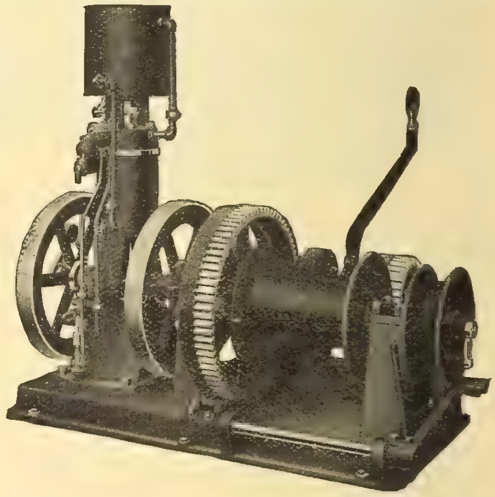
J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.

Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry,

Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING
and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Stayner-ville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to colo., 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65

No. 4½ Fuller's ....net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b. Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.

Turpentine, in barrels, 89 cents per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Aime Bissonnette, contractor, Montreal, Que., it is stated, has assigned.

Silica Brick & Lime Company, Victoria, B.C., assets advertised for August 30th.

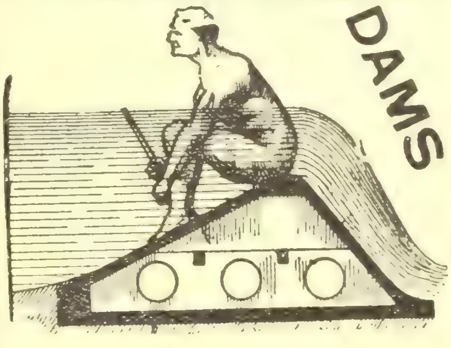
Vaillancourt & Hardy, plumbers, Montreal, Que., are stated to have dissolved.

E. W. Craik, woodworker, Shoal Lake, Man., it is stated, has been succeeded by J. Simpson.

The F. C. Hunt Plumbing Company, London, Ont., it is stated, assigned August 17th to Alfred Robinson.

The architectural firm of Messrs. Watt, Jacques & Williamson, London and Windsor, have dissolved partnership. Mr. John M. Watt, architect, will take over the head office at London, and Messrs. Jacques and Williamson take over the Windsor branch, under the name of Jacques & Williamson, architects. Mr. John M. Watt will be located at 316 Masonic Temple, London, Ont., and Messrs. Jacques & Williamson will be located in the Jordan and Griffith building, Windsor, Ont.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

Established 1882
THE COMMERCIAL
The weekly financial, commercial & general trade newspaper of the Great West.
Winnipeg Manitoba

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

New Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's Cement

Alsen's Cement

was selected for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith.

Alsen's American Portland Cement Works

45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co.
Woodstock, Ont. Limited

The
"Simplex" Stone and Marble Cutter

No need of carrying a heavy load of tools. Use "Simplex" handles with adjustable cutters. Cheaper than sharpening and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

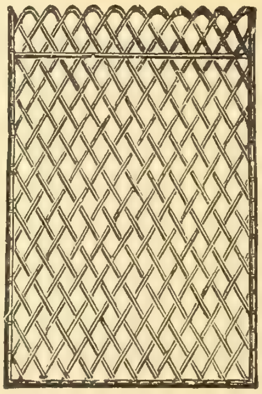
"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

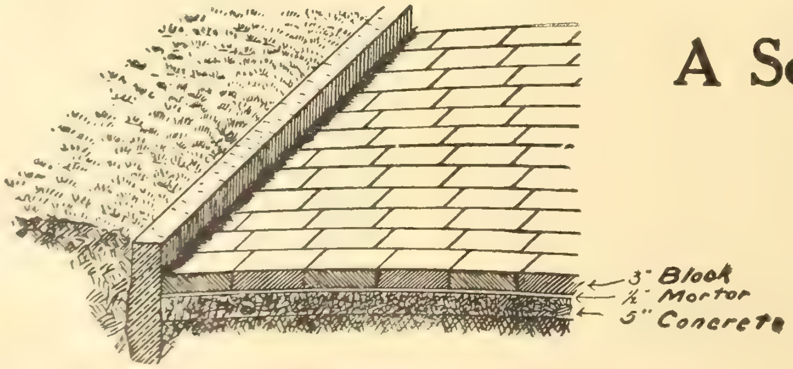
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

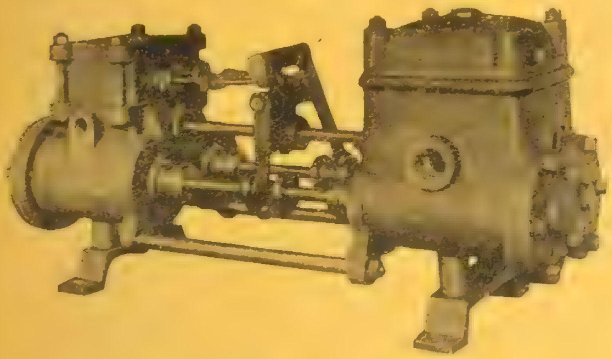
Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

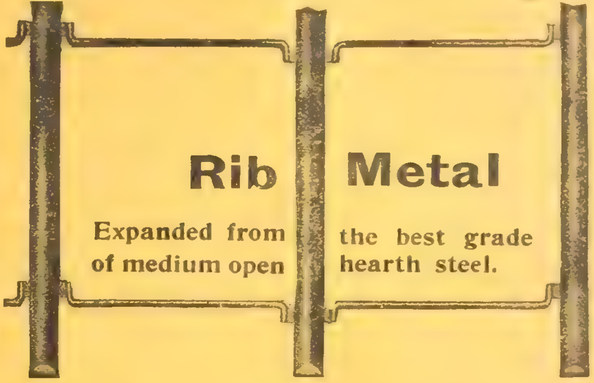
Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.


Rib Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

A FULL LINE

is hard to find, we have a full line of Cast Fittings for Steam, Gas, Oil and Water. They are all A I. Send us a trial order.

Screwed and Flanged

ASK FOR S BRAND

It Means Standard

Flanged Elbow

Reducing Flanged Tee
Reducing in Run or Branch

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

Hoisting Engines

Steam - Belt Driven

Electric Hoists

of all capacities for Prompt Shipment

We can furnish hoists designed to suit every purpose; our hoists give the maximum results at a minimum cost.

"Industrial"

Coaling and Locomotive

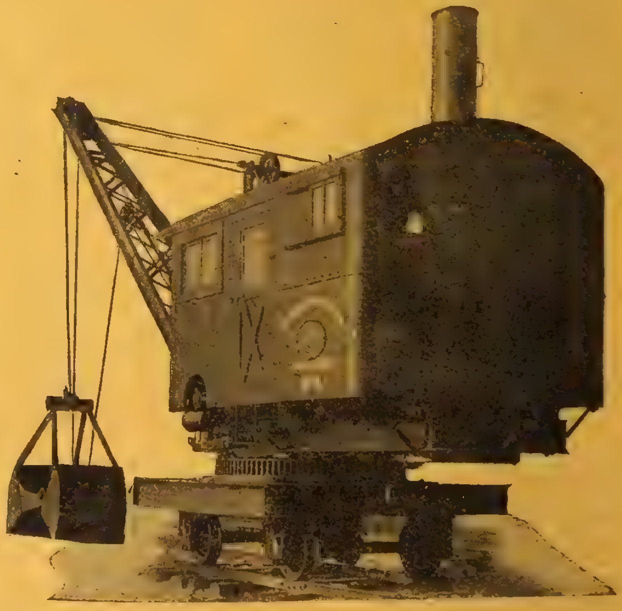
Cranes

in capacities from five to one hundred tons

for use about

Manufacturing Plants, Railroad Yards, Coaling Stations, Quarries, Etc.

Full particulars upon request.



F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **E. A. Earle & Co., Vancouver**

Vol. 24 Toronto, September 21, 1910 No. 38

Contract Record

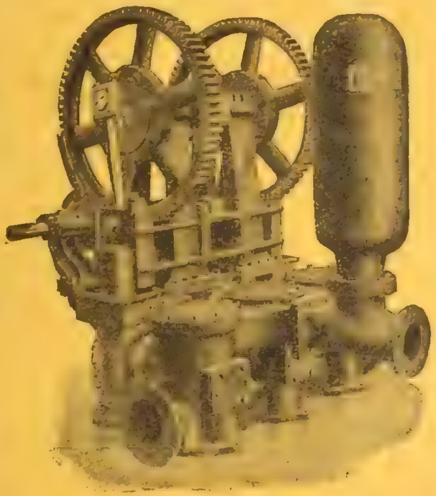
ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps

Condensers

Travelling Cranes, etc.



WRITE FOR CATALOGUE

The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

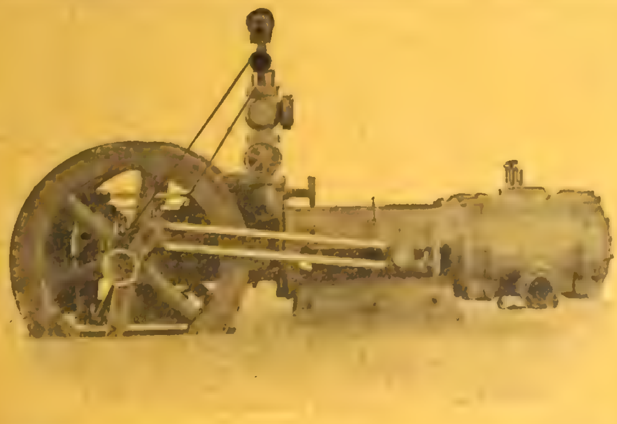
Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited

(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

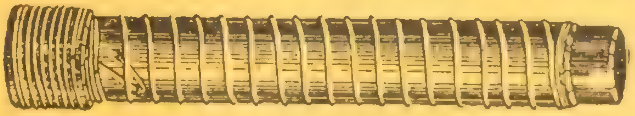


CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity—Efficient Regulation
Large Bearings—Rigid Construction

Ask for Descriptive Catalog K 81

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend **"Luxfer-Prisms"** every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE
PORTLAND CEMENT

Mills at
Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :
Montreal

Sales Offices :
Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page
Canada Wire Goods Mfg. Co 15
Dennis Wire & Iron Works 16

Belting
Federal Engineering & Supplies, Ltd 51

Boilers
Inglis, John 22
Jenckes Machine Co 2
Marsh & Henthorn 51
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co 63
Waterous Engine Works Co.......

Brick
American Enamelled Brick Co. .....
Canadian Pressed Brick Co 55
Don Valley Brick Works 7
Hamilton Pressed Brick Co 10
Milton Pressed Brick Co.....
Port Credit Pressed Brick Co. 55
Toronto Pressed Brick Co. .....

Bridges (Steel)
Canadian Bridge Co 18
Cleveland Bridge Co 18
Dickson Bridge Works .....
Dominion Bridge Co 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware
Taylor-Forbes Co 63

Cement
Alsen Portland Cement Co 62
Britnell & Co 53
Bremner, Alex 59
Canada Cement Co 3
McNally & Co., W 55
Morrison & Co., T. A 60
Rogers, Alfred 4
Rogers Supply Co 31
Sand and Supplies 55

Conduits Page
Conduits Co., Limited 53

Concrete Mixers and Machinery
Canada Foundry Co 54
Cropp Concrete Machinery Co 6
Goold, Shapley & Muir 9
Hopkins & Co., F. H 64
Jenckes Machine Co 2
London Concrete Machinery Co 21
Mussens Limited 32
Morrison & Co., T. A 60
Rogers Supply Co 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Beath & Son, W D 8
Buffalo Steel Co 19
Canada Wire Goods Mfg. Co 15
Hamilton Iron & Steel Co .....
Trussed Concrete Steel Co 52

Contractors' Plant
Beatty & Sons, M 15
Hepburn, John T 17
H. & E. Lifting Jack Co .....
Hopkins & Co., F. H 64
Katie Foundry Co 60
Marsh & Henthorn 51
Mussens Limited 32

Crushers (Stone and Rock)
Hopkins & Co., F. H 64
Jenckes Machine Co 2
Mussens Limited 32
Morrison & Co., T. A 60

Corrugated Iron
Galt Art Metal Co .....
Metallic Roofing Co 51
Metal Shingle and Siding Co 20
Ormsby, A. B., Limited 5
Roofers Supply Co 59

Contractors Page
McIlwraith, Jas. A 60

Drills
Beatty & Sons, M 15
Canadian Rand Co 1

Deafening Felts
Cabot, Samuel, Inc 55

Drilling Contractors
Harvey, J 61

Dredges
Beatty & Sons, M 15

Engines
Canadian Boving Co .....
Inglis, John 22
Jenckes Machine Co 2
Mussens Limited 32
Waterous Engine Works Co .....

Excavators
Harris, J. W 11

Electrical Apparatus and Supplies
Northern Electric & Mfg. Co 36

Engineers (Civil and Mechanical
Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Davis & Johnston 60
Farmer, John T 60
Fuce, Edw. O 60
Galt Engineering Co., John 60
Glaubitz, H. J 60
Hunt & Co., Robt. W 55
Inglis, John 22
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H 60
McRae, John B 60
Moore & Scollan 60
Nadel & Adler 60

Fire Apparatus Pag
Morrison & Co., T. A 60
Seagrave, W. E 16

Fireproof Doors and Windows
Douglas Bros 14
Mussens Limited 32
Ormsby, A. B 5

Granite and Marble
Laurentian Granite Co 60
Missisquoi Marble Co .....
Rogers Supply Co 31
Smith Marble & Construction Co..

Glass
Chance Brothers & Co 12
Consolidated Plate Glass Co 57
Luxfer Prism Co 2
Thompson & Co., B. & S. H 12
Toronto Plate Glass Importing Co.. 1

Heating Apparatus
Jenckes Machine Co 2
Taylor-Forbes Co 63

Hoisting Machinery
Beatty & Sons, M 15
Inglis, John 22
Jenckes Machine Co 2
Hopkins & Co., F. H 64
Marsh & Henthorn 51
Mussens Limited 32
Scott Machine Co 57

Hydrants
Canada Iron Corporation 59
Gartshore-Thompson Pipe Co 58
Kerr Engine Co .....

Lime
Christie, Henderson & Co 17
Jamieson Lime Co 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

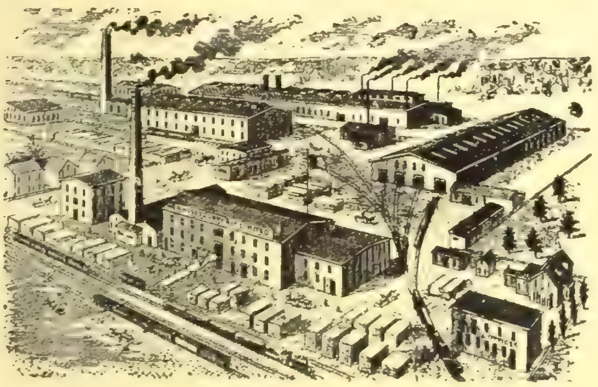
Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Rhodes, Curry Co., Limited

Lessees



Bank and Office Fittings

SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N.S.

BRANCHES AT
Halifax Sydney

From Niagara to the Sea

"September the most beautiful month of the year on the St. Lawrence"

Through the famous 1000 Islands and "Shooting the Rapids" of the St. Lawrence to Montreal, Quebec and the marvelous Saguenay

Via the

RICHELIEU & ONTARIO NAV. CO.

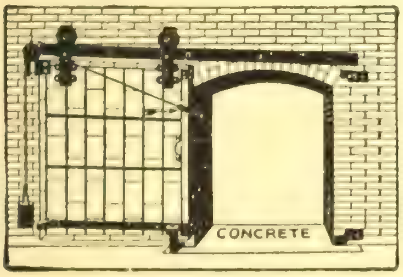
For full Particulars, Rates, Folders, etc. apply

THOMAS HENRY,
Traffic Manager, Montreal

JOS. F. DOLAN,
City Passenger Agent

Fire Doors Must Pass Two Parties Anyway

They are, the Architect and the Underwriter. A Labelled Door is the only door that will pass the Underwriters. Fire Doors are recommended because they mean a reduction in Insurance Rates and because they are a Fireproof article. On a labelled door only you get the full Insurance allowance and you cannot tell until a fire comes if an Unlabelled Door is fireproof, then it is too late. Specify the Ormsby "Underwriters." Have satisfaction and a guaranteed article.



Manufactured by

A. B. ORMSBY, Limited

Experts in Fireproof windows and Doors

Factories - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited

Hagersville - Ont.

Lumber and Interior Finish Page
Batts Limited 10
[illegible] Lumber Co 17
Delaplante Ltd 20
Eaton & Sons, J. R. 21
Georgian Bay Shook Mills 63
Rhodes Curry & Co 5
Sanitary Floor Co. 62
Siemon Bros. 57
Woodstock Lumber Co 62

Metal Lath
Galt Art Metal
Metallic Roofing Co. 51
Noble C. W 20

Meters
Hopkins & Co., F. H. 64
Neptune Meter Co 15

Paving and Paving Materials
Dominion Carbolineum Works
Metropolitan Paving Brick Co. 53
Ontario Asphalt Block Co. 62
Silica Barytic Stone Co., of Ontario 61

Plaster
Albert Mfg. Co. 63
Britnell & Co 53

Pipe
Canadian Pipe Co. 58
Dominion Wood Pipe Co. 9
Gartshore-Thomson Pipe Co. 58
Municipal Construction Co. 16
National Iron Works 59
Pacific Coast Pipe Co. 1

Power Engines
Inglis Co., John 22

Paints and Varnishes
Cabot, Samuel, Inc. 55
Glidden Varnish Co. 34
Paterson Mfg. Co.

Pile Driving Page
Lincoln Construction Co. 16

Pumps and Pumping Machinery
Beatty & Sons, M. 15
Goulds Pump Co. 53
Hopkins & Co., F. H. 64
Inglis Co., John 22
Martin Steam Pump Co.
McDougall Caledonian Iron Works, John 31
Mussens Limited 32
Ontario Wind Engine & Pump Co. 57
Smart-Turner Machine Co. 1
Waterous Engine Works Co.

Roofing Materials
Barrett Mfg. Co.
Brantford Roofing Co 11
Galt Art Metal Co.
Metallic Roofing Co. 51
Metal Shingle & Siding Co. 20
Noble, Clarence W 20
Rogers Supply Co. 31
Roofers Supply Co. 59

Railway Supplies
Gartshore, John J. 60
Hopkins & Co., F. H. 64
Mussens Limited 32

Road Machinery
American Road Machinery Co. 10
Case Threshing Machine Co. 58
Climax Road Machine Co. 58
Morrison & Co., T. A. 60
Mussens Limited 32

Sewer Pipe
American Sewer Pipe Co. 56
Britnell & Co 53
Canada Iron Corporation 59
Dominion Sewer Pipe Co. 56
Gartshore-Thomson Pipe Co. 58
Hamilton & Toronto Sewer Pipe Co. 57
National Iron Works 59
Ontario Sewer Pipe Co. 14
Rogers Supply Co. 31
Standard Drain Pipe Co. 56

Sand
Rogers Supply Co. 31
Sand & Supplies 55

Stone Page
Britnell & Co. 53
Christie, Henderson & Co. 17
Consolidated Stone Co.
Contractors' Supply Co. 59
Corinthian Stone Co. 15
Crushed Stone, Limited 54
Doolittle & Wilcox 59
Hagersville Contracting Co. 5
Laurentian Granite Co. 60
Maloney John 19
Morrison & Co., T. A. 60
Myers, Oakley 54
Rogers Supply Co. 31
Roman Stone Co 17
Sackville Freestone Co. 15
Sand and Supplies 55

Structural Iron and Steel
Buffalo Steel Co. 19
Dominion Bridge Co. 18
Hamilton Iron & Steel Co. 34
MacKinnon Holmes & Co.
Pennsylvania Steel Co. 18
Phoenix Bridge & Iron Works 19
Queen City Foundry Co. 60
Reid & Brown 60
Salter, W. H. 19

Shovels (Steam)
Beatty & Sons, M. 15
Hopkins & Co., F. H. 64
Mussens Limited 32

Shingle Stains
Cabot, Samuel, Inc. 55

Slate
Roofers Supply Co. 59

Steel Shingles and Ceilings
Galt Art Metal Co.

Safes and Vaults
Taylor, J & J 19

Stone Cutters
Bailey-Underwood Co. 62

Sheathing Papers
Cabot, Samuel, Inc. 55

Telephone Supplies
Northern Electric & Mfg Co. 34

Tiles
Smith Marble & Construction Co.

Tanks and Stand Pipes
Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 51
McDougall Caledonian Iron Works 31
Ontario Wind Engine & Pump Co. 19

Valves
Canada Iron Corporation 59
Gartshore-Thomson Pipe Co. 58
Kerr Engine Co.
Standard Fitting & Valve Co 63

Ventilating System
Gardiner & Gaskill

Waterproofing for Cement and Brickwork
Cabot, Samuel, Inc. 55

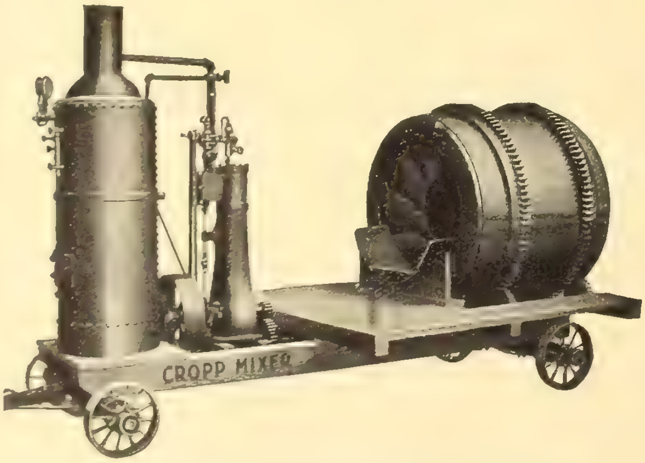
Wire Rope
Dominion Wire Rope Co. 69
Greening Wire Co., B. 62
Smith, Thos. & Wm. 13

Wire Guards and Screens
Canada Wire Goods Mfg. Co. 15

Water Wheels
Canadian Boving Co.

The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

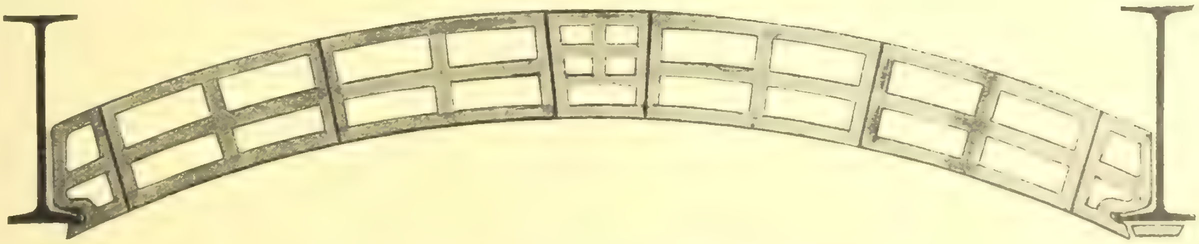
Cropp Concrete Machinery Co., **84 Lasalle Street, Chicago, Ill., U. S. A.**

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

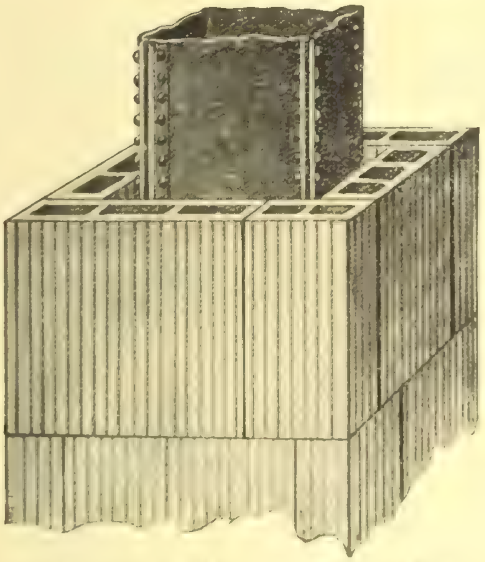
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

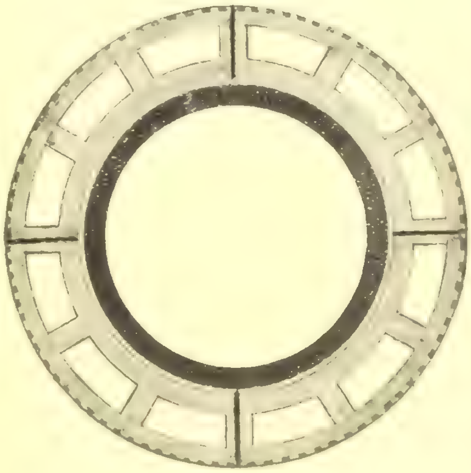


Section showing style of Skewbacks and Keys

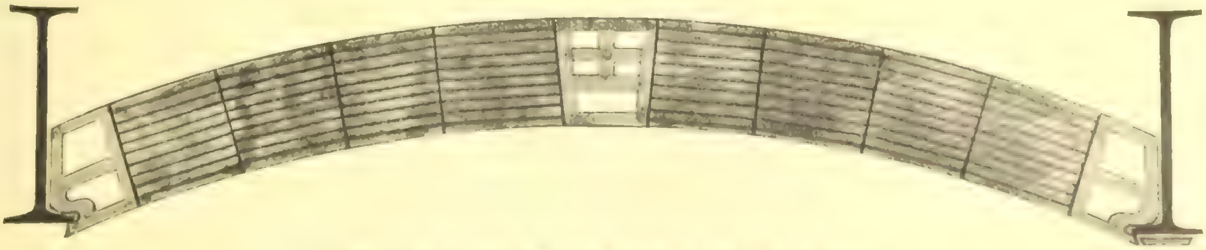


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



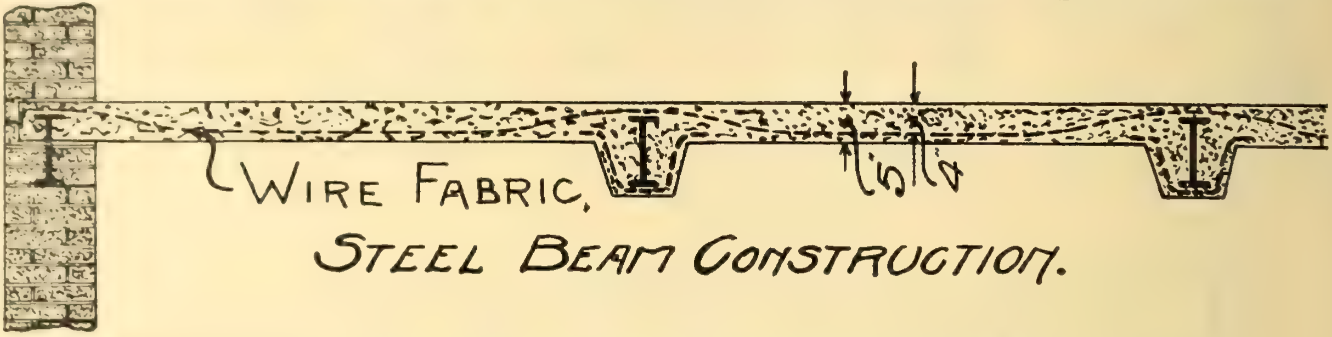
Section showing style of Skewbacks and Keys

THE DON VALLEY BRICK WORKS

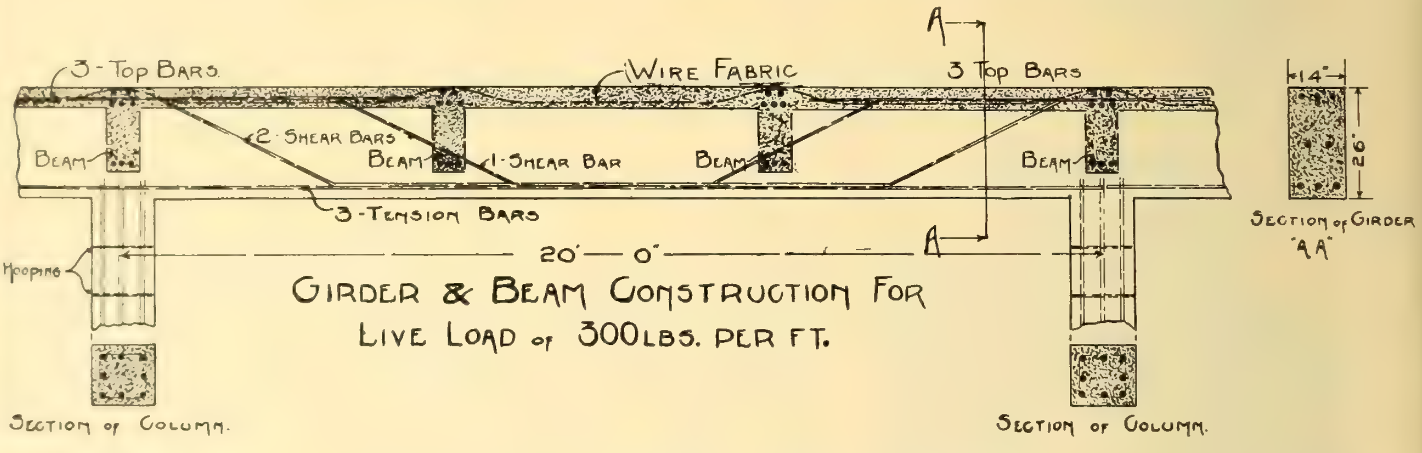
Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Typical "BEATH SYSTEM" Floors



Detail of Construction of span showing continuous bond and location of the Wire Fabric reinforcement as applied to the floor construction where steel framework is used.



BEATH BARS We use for this purpose plain or deformed bars as the case warrants. We design the construction and supply the Bars cut to length ready to lay.

OUR ENGINEERING DEPARTMENT Can render architects and engineers highly efficient service in designing reinforced concrete construction, and this service is freely at your disposal. Given the architectural drawings and necessary data, we will submit you a plan of entire reinforced concrete portion of work, showing our Reinforcement in place.

USERS OF "BEATH" SYSTEM

Halifax P.O., Halifax, N.S.
Dominion Express Co., Ottawa, Ont.
Erindale Power Co., West Toronto
Dominion Concrete Co., Kemptville, Ont.
Winch Building, Vancouver, B.C.
Victoria Sheds, Victoria, B.C.
Petrolea Bridge Co., Petrolea, Ont.
Molsons Bank, Edmonton.

Filtration Plant, Toronto, Ont.
Thomas C. Watkins, Hamilton, Ont.
Joseph Vincent, Union, Ont.
Robert Simpson Co., Ltd., Toronto
Murray Shoe Co., London, Ont.
Septic Tanks, St. Thomas, Ont.
Septic Tanks, Clinton, Ont.
C.P.R. Elevators, Victoria Harbor

Transformer Stations at
Toronto, Paris,
Dundas, Preston,
Niagara Falls, St. Marys,
St. Thomas, Stratford,
London, Guelph,
Woodstock, Berlin,
Etc., Etc.

W. D. Beath & Son, Limited

Engineers and Manufacturers

TORONTO, ONT.

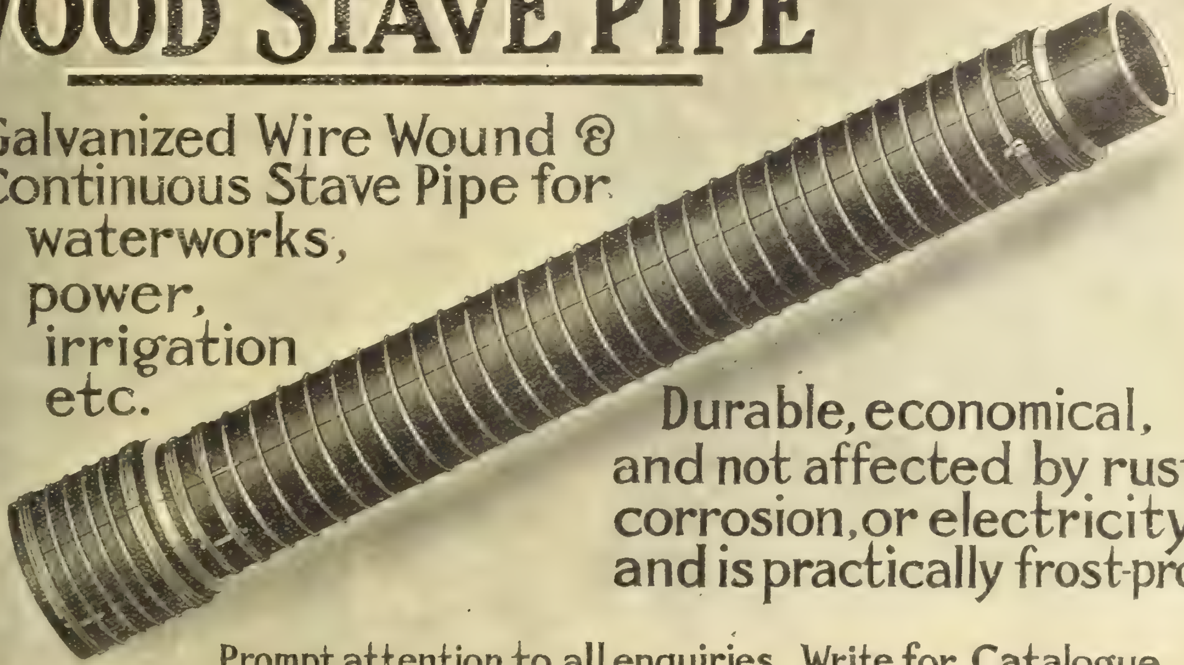
WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

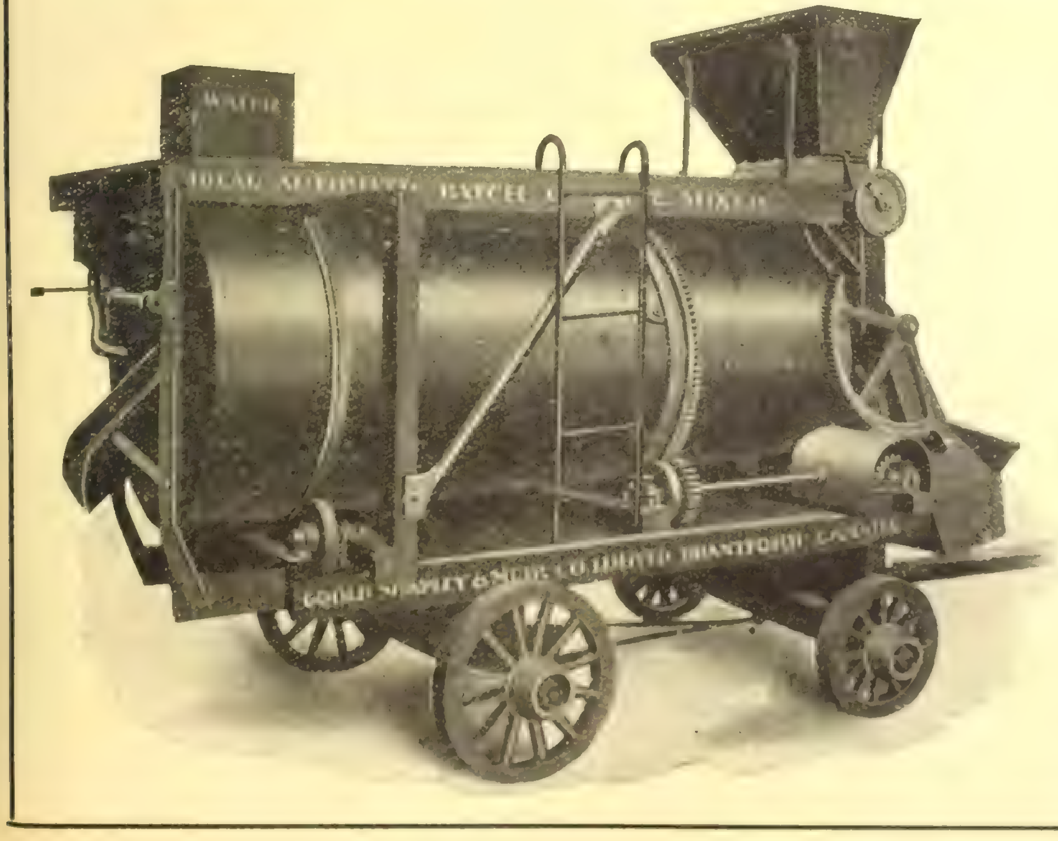
Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.



Brantford "Automatic" Batch Concrete Mixer


WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

Henry New　　Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

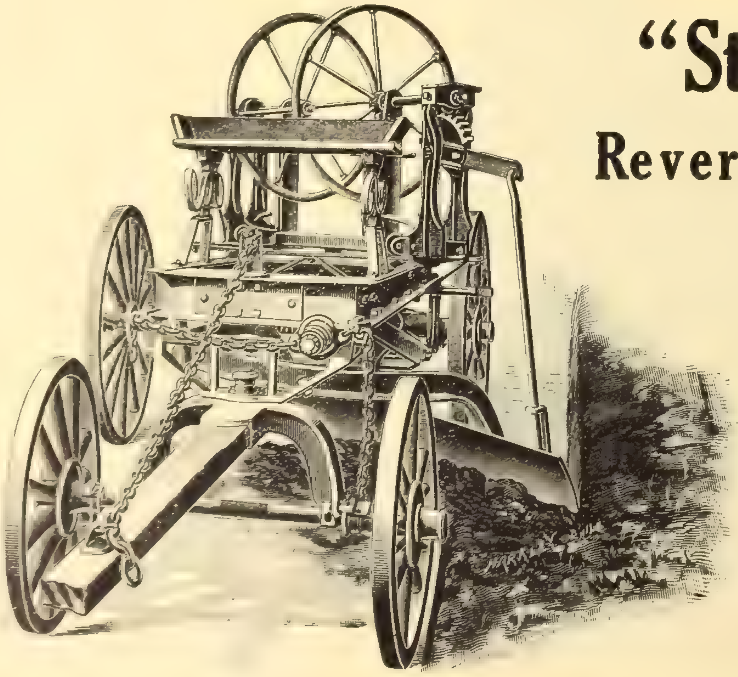
Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

Toronto Officials Recognize the Fire-Resistant Qualities of

Brantford Roofing

Along with slate and iron, Brantford Roofing is accepted by the City Architect and Chief of the Fire Department for use in the most congested district in Toronto. We have a certificate to that effect. Do you know of any other ready roofing that has such a certificate? We think not.

The Toronto officials recognize a REAL fire-resistant roofing when they find one. So do the fire-insurance companies. They give lower rates for buildings covered with Brantford Roofing.

These facts are worthy of a builder's or contractor's most careful consideration when selecting or specifying roofing material for his contracts.

Send for interesting Roofing Book and Samples.

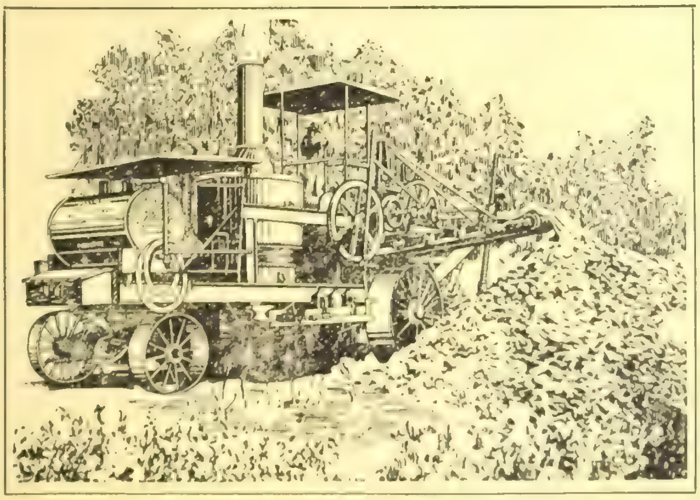
Brantford Roofing Company, Limited

Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

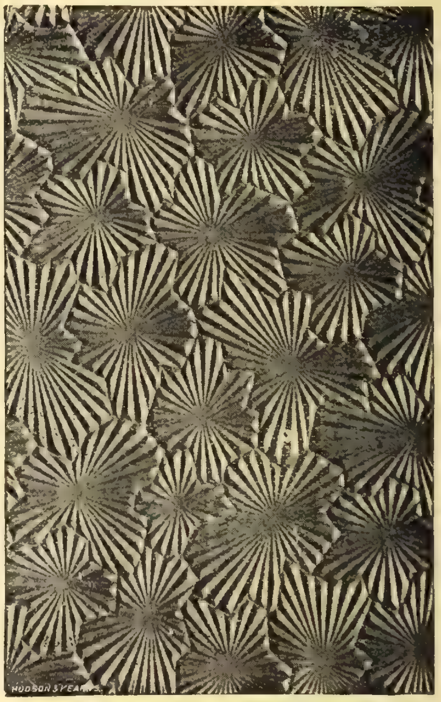
J. W. Harris Mfg. Company, Ltd.

MONTREAL

Chance's
Double Rolled Cathedral Glass

is brighter and more translucent than the ordinary Rolled Cathedral Glass. It cuts true and easily, and works up handsomely into leaded windows. Made in a very large variety of tints.

Chance's Figured Rolled Glass is famous for its deep, brilliant patterns, easy cutting qualities and attractive tints. The popular "Muranese" pattern illustrated here is made in three sizes, of which this shows the smallest.



Chance's Figured Rolled.
Muranese (small) Pattern.

"Flemish" Glass, made only in the glass works of Chance Bros. & Co., near Birmingham, England, is a new and most attractive Ornamental Window Glass, unsurpassed for character and brilliancy.

Write for samples of Chance's Figured Rolled, Muffled, Double Rolled Cathedral and Flemish Glass.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. &. Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

Sewer and Culvert Pipe

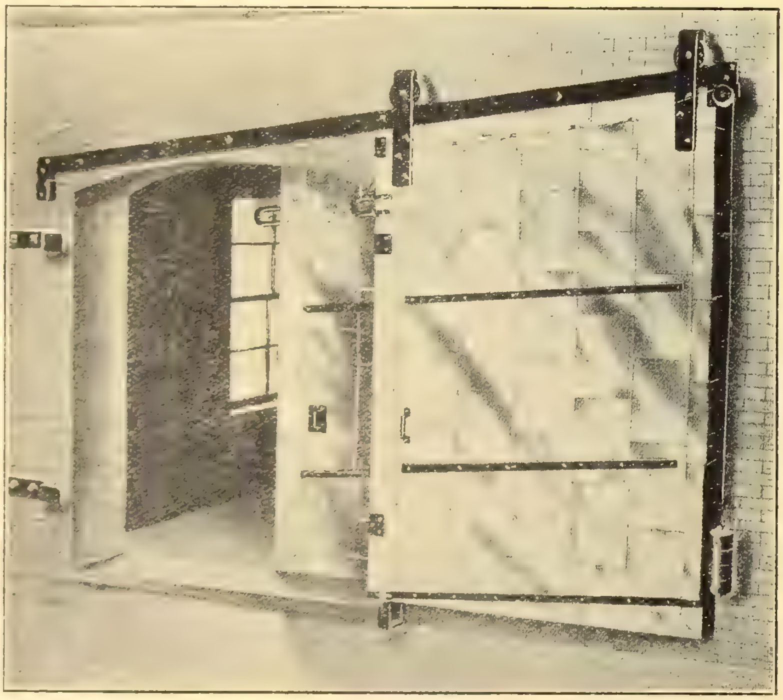
made of

FINE PLASTIC CLAY and WELL BURNED are about as DURABLE as the pyramids. They are the only class of pipe on which the ACIDS and GASES of SEWAGE HAS NO EFFECT. If you want a PERMANENT job and the kind of clay goods that are SURE TO PLEASE, write us for particulars.

Large Stock 4 inch to 24 inch, always on hand.

Telephone Toronto Connection, Parkdale 422.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many o' the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK
WIRE CLOTH AND WIRE GOODS

Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

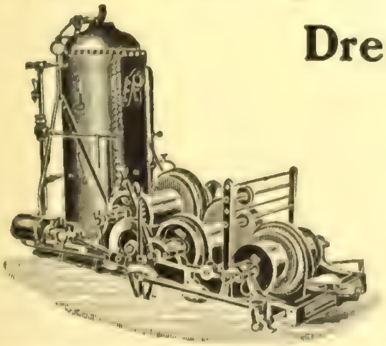
Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited **Welland, Ontario, Canada**



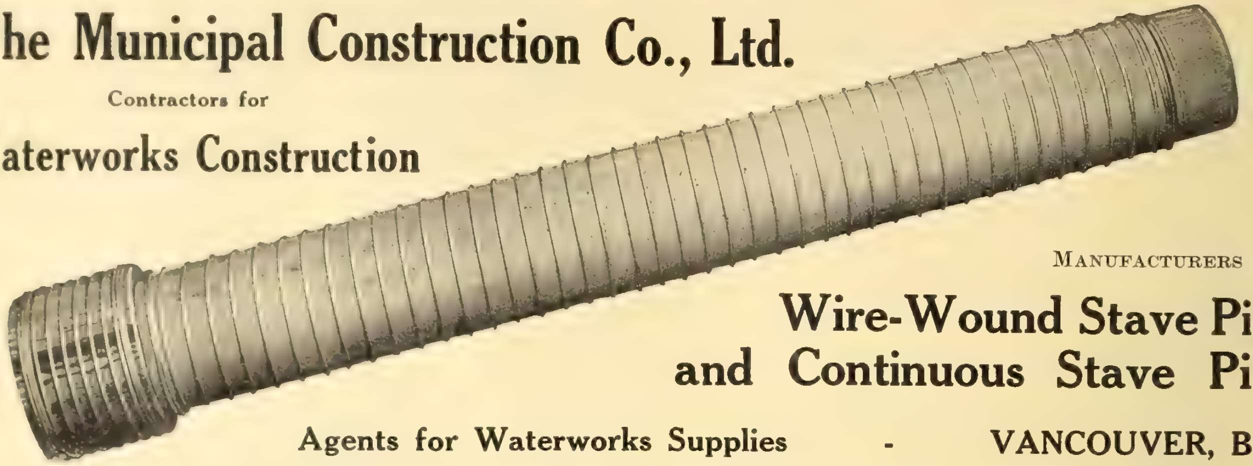
Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction



MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

DENNIS - LONDON ORNAMENTAL IRON

The **Dennis Wire & Iron Works Co.** Limited

London, Canada

Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

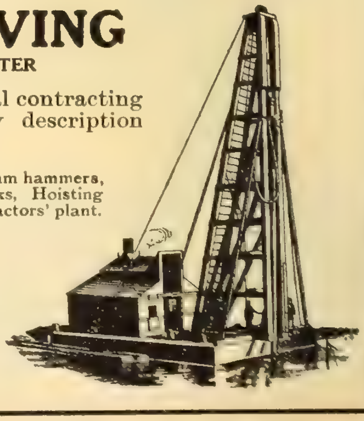
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone
(Trade Mark Registered)

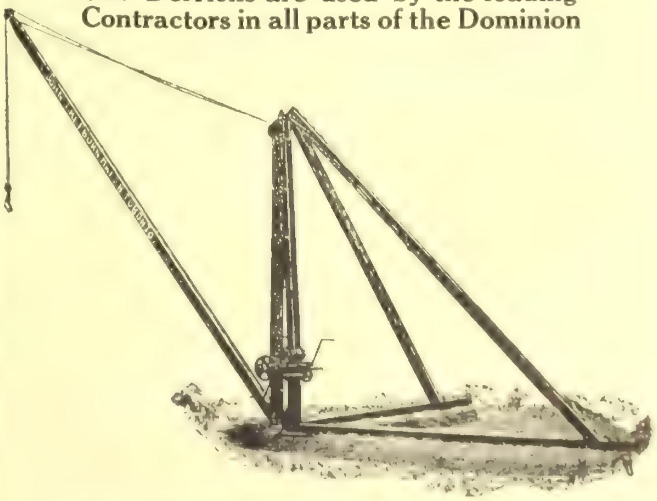
is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

Our Derricks are used by the leading Contractors in all parts of the Dominion



They are made in standard sizes from ½ ton upwards, have single and double purchase gears, hand brake, and an ample length of first quality wire rope.

From first to last they are made from the finest materials, by our own workmen, and in our own shops.

They may be operated either by hand or power, and effect a labour-saving of fully fifty per cent. over the old style derrick.

JOHN T. HEPBURN
18-40 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 **TORONTO**

Branches Vancouver and Winnipeg

Montreal

The

Phœnix Bridge & Iron Works

MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**

Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds

(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.

Limited

TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

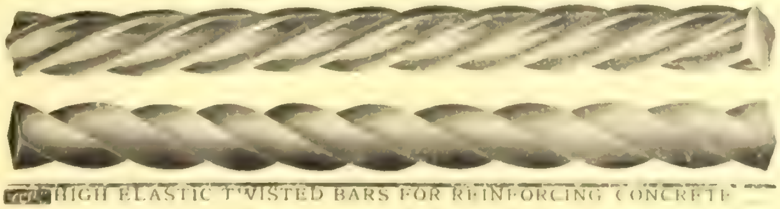
Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing. Also ¼" soft steel rounds.

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher

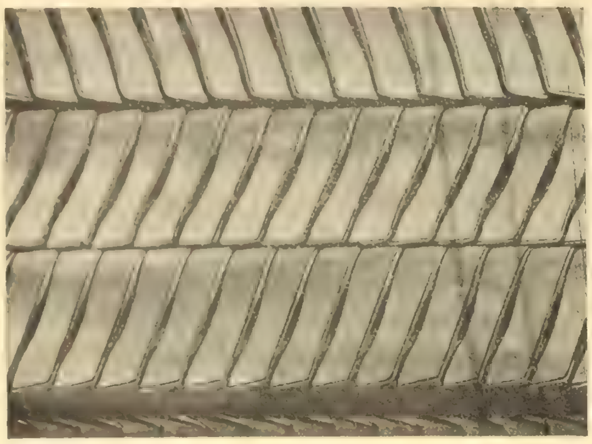
Immediate Shipment from Stock

Cut to Required Lengths


HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

BUFFALO STEEL CO., Tonawanda, N. Y. (Suburb of Buffalo N. Y.)

Toronto Office
117 Home Life Building



Herringbone Lath

Best for Cornices

Stiff in one direction—the ribs assure that—pliable in the other direction on account of the flattened filaments. Easily bent around the brackets but stiff enough the other way to allow the brackets to be spaced well apart. And brackets cost money.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

ZINC ORNAMENTS

An extensive range to select from. Special designs made to order on short notice

Every little while we make new additions to our already extensive range of zinc ornaments. This class of work is a specialty with us and we have originated many exceptionally handsome ornaments for use in connection with outside cornices, pilasters, capitals, pediments and other purposes. We have unsurpassed facilities for doing special work on short notice. When figuring on a contract calling for zinc ornaments it will pay you to consult us for suggestions.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Montreal, P. Q. **PRESTON, ONTARIO**

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers

Made in two sizes

No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money
- On the first cost of machine
- On cost of operation
- On cost of mixing concrete

Our Automatic Machines do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired

We also manufacture a Standard Drum Batch Mixer in four sizes, 7 ft 10 ft. 20 ft. and 30 ft. The most complete Drum Mixer out. We have every thing in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent, 52½ Princess St., Winnipeg, Man.	Geo. B. Oland & Co. 28 Bedford Row, Halifax, N. S.	A.G. Brown & Co., 1048 Westminster Ave., Vancouver, B. C.

Agents for Montreal: Lemaire Bros., [illegible] Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is [illegible] inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilating the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horror.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

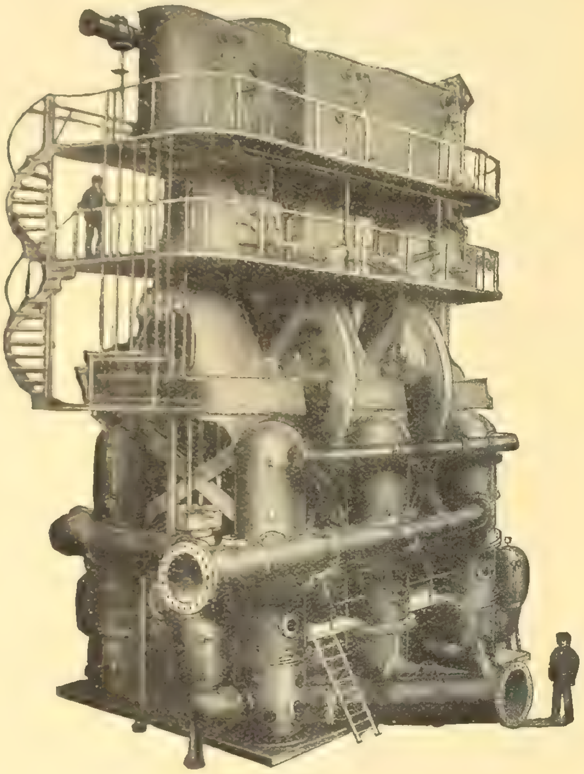
Please Send for Samples and Prices

J. R. Eaton & Sons

Orillia, Ontario

Montreal Agent: C. [illegible] [illegible], [illegible] St. François Xavier St.

Waterworks Pumping Plants



CAPACITIES

from one to

15 Million Gallons

Per 24 Hours

Expert unbiased advice gladly given. Let us help you solve your waterworks difficulties. ::

The *high economy* attained with **"INGLIS"** Waterworks Pumping Engines is the result of correct design; careful selection of materials and the highest grade of skilled labor.

We shall be glad to furnish full details of these engines, upon request

The John Inglis Company

ENGINEERS AND BOILERMAKERS **Limited**

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Almonte, Ont.

Tenders addressed to Arch. McCallum, chairman, will be received until September 28th for construction of septic tank, etc. Plans, etc., at office of above.

Biggar, Sask.

$15,000 will be expended on waterworks and fire protection. Commissioner Bayne has details.

Barrie, Ont.

Tenders will be received by E. Donnell, town clerk, up to October 1st, for the construction of sewers on Main street. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

County of Prince Edward, Ont.

A by-law has been passed to issue $35,000 4½ per cent. 20-year road debentures.

Dundurn, Sask.

A by-law is being prepared to issue $14,000 8 per cent. 20 instalment road improvement debentures.

Galt, Ont.

Tenders are being called until September 28th for purchase of $26,000 worth of debentures for sewer and storm drains.

Gravenhurst, Ont.

The by-law to raise $10,000 for the purpose of improving the highways in the Township of Muskoka was defeated.

Moose Jaw, Sask.

Tenders are being called by the city until September 26th for laying about 2,100 lineal feet of 10-inch tile sewer and 6-inch c.i. water main; selling necessary hydrants and valves, etc. Plans, etc., at office of J. M. Wilson, city engineer. W. F. Heal, city clerk.

Montreal, Que.

Tenders are being called until September 30th by Board of Commissioners for construction of sewers in the following streets: Boulevard street, Antoine, Tetraultville from River St. Lawrence to Dorchester and along the latter. Specifications with City Surveyor. L. N. Senecal, secretary.

Tenders have been opened for the 3,210 foot long steel pipe and concrete work in connection with the intake pipe, which it was estimated would cost about $115,000. Eight firms tendered, including Munderloh & Company, John Inglis, Limited, Laurin & Leitch, Lemoine & Sons, L. A. Desy, Harris & Company, M. Connely and Beaudry Leman. In some cases the tenders were for the complete work, and in others for the steel and concrete work respectively.

New Liskeard, Ont.

C. H. Fullerton is the engineer in charge of the waterworks extension for which bylaw was passed. Debentures have not been sold. Estimated cost, $5,250.

Nanaimo, B.C.

S. Gough, city clerk, writes that in the matter of pavements about as much is contemplated as the present contract ($25,000) embraces. Sewers costing about $70,000 will be installed. Present sewer contract embraces outlet and main trunk lines in portion of city.

Ottawa, Ont.

Carleton county council instructed the county clerk to call for tenders for a stone crusher and dump carts for the county.

Rouleau, Sask.

This municipality will borrow $45,000 for installation of waterworks system.

Prince Albert, Sask.

Tenders will be received by C. O. Davidson, city clerk, up to September 30th for the supplying and erection of two centrifugal electrically driven automatic control sewage pumps. See advertisement in "Tenders and For Sale Department" of this issue.

Toronto, Ont.

Waterworks Engineer Fellowes has announced that new intake and conduit will be built next year. Estimated cost, about $300,000.

Victoria, B.C.

The following bids were received for the paving of four streets under the local improvements plan: City Engineer — For standard asphalt — Fernwood road, $19,000; Rockland avenue, $18,425; Richardson street, $12,080; Fort street, $10,375. Worswick Paving Company — Fernwood road, as specified by city engineer, $18,678; alternative, $14,978; Rockland avenue, $18,745 and $14,895; Richardson street, $11,705 and $9,060; Fort street, $10,375 and $9,060. Pacific Coast Construction Company — The following figures are for standard asphalt, 4-inch foundation, 5-inch foundation and 6-inch foundation, respectively — Fernwood road, $18,786, $15,086, $17,036 and $17,972; Rockland avenue, $18,153, $14,303, $16,613 and $17,306; Richardson street. $11,127, $9,077, $10,267 and $10,654; Fort street, $9,702, $7,802, $8,942 and $22,840. These tenders were referred to the purchasing agent and city engineer.

Tenders for asphalt pavement were received as follows: Warswick Paving Company, Rockland avenue, approximately 7,100 square yards of pavement and 1,300 lineal feet of curbs and gutter pavement, $2.35 per yard; curbs and gutters, 28 cents per foot. Total, $18,745. Richardson street, 4,300 square yards of paving, 3,200 feet of curb and gutters. Paving $2.35 per yard, curbs and gutters, 50 cents per foot. Total, $11,705. Fernwood road, 7,400 yards paving, 4,000 feet curbs and gutters. Paving $2.35 per yard, curbs and gutters, 50 cents per foot. Total $18,678. Fort street, 3,800 gutters. Paving $3.00 per yard, curbs and gutters. Paving $3.00 per yard, curbs and gutters, 28 cents per foot. Total $12,100. The above tenders are for a standard pavement on a concrete base, but the Warswick Paving Company also put in an alternative bid for a pavement on a conglomerate base the same as on Linden avenue. These bids were as follows: Fernwood road, paving, $1.85, curb, 28 cents; Rockland avenue, paving, $1.85, curb, 50 cents; Richardson street, paving, $1.90, curb, 50 cents; Fort street, paving, $2.20, curb, 28 cents. In the above bid for Fort street the higher figure is accounted for by the fact that between the street railway tracks wood blocks will be used. The bids of the Pacific Coast Construction Company were as follows: $2.18 yard for paving and 40 cents per foot for curb and gutters for a standard pavement according to the specifications of the city engineer, being a six-inch concrete base, with a two-inch wearing surface. Alternate bids were also put in by the company at $1.19 and 40 cents respectively for paving and curbs, this pavement to be laid on a five-inch base with two-inch wearing surface. The above tenders were referred to the city engineer for report.

Welland, Ont.

The by-law to expend $52,000 on improving the present system of waterworks was carried.

AWARDED.

Dauphin, Man.

Tenders for the construction of the waterworks and supply of material were let as follows: The contract for the piping to Canadian Pipe Company, of Vancouver; ditching and back filling, Flanagan & Murphy, of Weyburn and Fort William. The Canada Iron Corporation, of Fort William, secured the contract for the supply of iron pipe for the town distribution system, and the American Sewer Company, Akron, Onio, were awarded the contract for the supply of sewer pipe. Hydrants and valves will be furnished by the London Foundry Company, of London, Ont. The general installation of the system in the town will be carried out by Flanagan and Murphy, in addition to the outfall sewer running into a septic tank near the Vermillion river. Chipman & Powers, consulting engineers.

Edmundston, N.B.

Messrs. Ouellet & Jacques, Des Chaillons, Que., were awarded the contract for distribution system of waterworks, at $35,381. Others tendered as follows: J. J. O'Connor, Edmunston, N.B., $55,000; Kennedy & McDonald, Edmunston, $47,000; O. Pelletier, Cabano, Que., $60,800. V. H. Dupont, 62 St. James street, Montreal, engineer in charge.

Ottawa, Ont.

T. S. Kirby & Company has been awarded the contract for supplying stone for macadamizing Metcalfe road. The company has opened up a new quarry for the purpose about six miles south of the city.

Regina, Sask.

Only two regular tenders were received for paving Albert street, one from R. S. Blome Company (accepted), and one from the Parsons Construction Company. The first named company offered to put in granolithic blocks at $3.00 per square yard, and do the excavating at $1.00 per cubic yard.

Another concrete mixer will be brought to the city at once and the whole work will be rushed to completion at an early date this fall. The Parsons Construction Company offered to put asphalt blocks in the subway at $3.50 for 2½-inch blocks, and $3.80 for 3-inch blocks. Their tender bound them to complete the work by October 15.

The paving contract was divided as follows: The lowest tender for the work was made by the National Paving & Contracting Company, their price being $2.90 per square yard, if given the whole work, or $3.00 if given a fraction of it. They, however, could not promise to complete all the paving this year. The next lowest tender was from the Bitulithic Contracting Company. They will bind themselves to do all the work given to them this season. Their price for the paving was $3.05. The Western Pavers were given the contract for putting in all the curb and gutter at 67½ cents per lineal foot, and the straight curb at 37½ cents. Other tenders for the paving were as follows: R. S. Bloome & Company, $2.99; R. Bangham, Windsor, Ont., (2½-inch asphalt block), $3.50; The Kettle River Company (3-inch 16-lb. wood block), $3.94; 3-inch ,20-lb., $4.20. Sidewalks—Clement & Curran, Orillia, Ont., 17½ cents a square foot; R. S. Bloome & Company, 17¾ cents. Asphalt paving will be laid by the Natonal Paving & Contracting Company at $3.00 per square yard on McIntyre street, from Victoria to Sixteenth, and on Victoria from Albert street to Cameron. The Bitulithic Contracting Company will put in bitulithic at $3.05 per square yard on Smith street, from Victoria to Sixteenth; on Lorne street, from Victoria to Sixteenth; on Cornwall from Thirteenth to Sixteenth; on Victoria, from Broad to St. John street. This total area is 21,500 square yards.

St. Boniface, Man.
Guilbault & Company were awarded contract for concrete culvert over Seine river on a bid of $27,810.

Victoria, B.C.
The tender of the Worswick Paving Company was accepted for Fernwood road at $14,978, Rockland avenue at $14,895, Richardson street at $9,770, and the tender of the Pacific Coast Construction Company for a standard asphalt for Fort street at $9,702.

Winnipeg, Man.
The city has awarded the following works: Thomas Jackson & Son, sewer on Elmwood avenue, from Kelvin to Riverton avenue, $1,119.72; sewer on Riverton avenue to Elmwood avenue, $1,158.60; block pavement on the lane in the block bounded by Furby and Sherbrooke street, Cornish and Wolseley avenues, $1,792.83; granolithic walk west side of Vaughan street, $1,180.50. G. Dewitt, granolithic walks, totalling, $9,512; engineer of construction, wate ling $9,512. Engineer of Construction, water mains, $1,260; asphalt pavement, $11,335, etc.

Railroads, Bridges and Wharves

RAILROADS

Calgary, Alta.
The C. P. R. have plans for the construction of a large irrigation dam at Horseshoe Bend to cost $500,00.

Digby, N.S.
Tenders are asked by government for breakwater at Digby.

Edmonton, Alta.
The C. N. R .is again baulked in its efforts to locate a line west from Edmonton towards the Yellowhead Pass. Plans for the line from St. Albert west have been disapproved by the Railway Commission at Ottawa, on the grounds that the route proposed lay too close to that of the G.T.P.

Hazelton, B.C.
W. A. Williscroft is in charge of the bridge to be erected across the Nadina river. Bridge and approaches aggregate 1,189 feet, 1,000 feet of pile causeway, with three King truss spans of 63 feet each.

L'Assomption, Que.
Tenders are called by Department of Public Works, Ottawa, for ice pier here. R. C. Desrochers, secretary.

Ottawa, Ont.
See "Business Buildings."

Paspeblac East, Que.
Tenders are being called by the Department of Public Works, until October 10th for construction of breakwater here; also for construction of wharf at Bic. R. C. Desrochers, secretary.

St. John's, Que.
Tenders addressed to J. A. Raymond, secretary-treasurer, St. John's, Que., will be received until September 26th for construction of concrete piers and abutments, etc., for bridge between St. John's and Iberville. Tenders are also called until the same date for construction of steel. Plans, etc., at office of Messrs. Baulue & Mercier, civil engineers, 1173 St. Hubert street and at office of secretary-treasurer.

Toronto, Ont.
The C. P. R. is soon going to begin work on the construction of a new steel span for the Humber bridge. The bridge will be about 120 feet in length.

The Bloor street viaduct by-law will be voted on again by the people next January. It calls for an expenditure of $769,000, of which $150,000 is for land damages. The plan is that the viaduct consist of two sections: one 1,200 feet long to span the first Rosedale ravine, from Sherbourne street, and the other 1,450 feet long crossing the Don river.

Vancouver, B.C.
City Engineer Clement has been instructed to prepare plans for a wooden bridge to span the ravine between Glen and Keith drives, on Eighth avenue.

Virden, Man.
Tenders addressed to J. F. C. Menlove, secretary-treasurer, will be received until September 24th for supply and construction of a 60-foot reinforced concrete bridge. Plans, etc., at Department of Public Works at Winnipeg, and at the office of undersigned. Work to be completed by December 1st.

Winnipeg, Man.
Residents of Fort Rouge are anxious to have a new bridge replace the Osborne, or to have a new one constructed at the foot of Edmonton street.

AWARDED.

Dauphin, Man.
The Algoma Steel Bridge Company, Limited, have the contract for construction of steel bridge across Vermillion river at $4,350. Manitoba Bridge & Iron Works Company tendered at $4,300, concrete work extra at $15 a cubic yard.

Fredericton, N.B.
The contract for the Porter mill stream mouth bridge in Charlotte county, has been awarded to Jos. McVay & Sons. Tenders for either concrete or granite were asked for, and the former proved the lowest successful tender, being for about $1,400. The tender for the Inglewood mill bridge, in the parish of Musquash, has been awarded to John S. Hargrove, of Musquash, $800. The contract for the Nightingale brook bridge, parish of Lepreaux, Charlotte county, has been awarded to F. M. Cawley, of St. George, $1,300.

Halifax, N.S.
The government have awarded the following work: New wharf at Shelburne to Frank A. Rannan & Company; breakwater at Jiggins Mines to S. J. Reid, Musquodobod.

Public Buildings, Churches, Schools, etc.

Almonte, Ont.
St. Andrews congregation has decided to repair the "Auld Kirk" at the 8th line, and will construct a vault in the rear end for use in connection with the cemetery.

Brantford, Ont.
The Wellington Street Methodist Church has decided to spend $16,000 in church improvements, including a new organ.

Brandon, Man.
The Redemptorist Fathers here are to build two new Catholic churches near here.

Calgary, Alta.
A jail will be erected by the provincial government, and the police barracks are to be extended.

Carleton Place, Ont.
J. A. Ewart, architect, Ottawa, has prepared plans for the new Zion Presbyterian Church here to take the place of the one recently destroyed by fire. The plans are for a church which will seat about 650 people. It is of plain gothic design and will be 75 feet by 96 feet. It will have Beckwith stone walls trimmed with Indiana limestone. The church board is considering the plans. The estimated cost is $20,000.

Darlington, Man.
A public school, costing $8,000, will be erected here.

Edmonton, Alta.
The Alberta Government has purchased a site on Capital Hill, comprising 29 acres, for the provincial government house.

The city will erect a number of large exhibition buildings next spring.

Forest, Ont.
Tenders for heating and ventilating of high school addressed to J. M. Mackenzie, secretary, will be received until September 28th.

Gilbert Plains, Man.
The ratepayers voted on September 20th on a by-law to issue $10,000 6 per cent. 20-year school debentures. J. C. Turner, secretary-treasurer.

Gladstone, Man.
It has been decided to rebuild the skating rink which was blown down on June 20th. A new company has been formed.

Headingly, Man.
Tenders will be received for $4,200 6 per cent. 20-year school debentures. C. W. Johnstone, secretary-treasurer, Phoenix S. D., No. 1528, Headingly, Man.

Hanover, Ont.
Tenders will be received by John Taylor, town clerk, up to October 22nd, for the erection of the Public Library Building here. For further particulars see "Tenders and For Sale Department" of this issue.

Tenders will be received by John Taylor, town clerk, up to October 22nd for the erection of the Town Hall. For further particulars see "Tenders and For Sale Department" of this issue.

Halifax, N.S.

The Department of Naval Service is advertising for tenders until September 26th for alterations and repairs to the Naval Hospital at the Dockyard.

Tenders will shortly be called by the Navy Department, Ottawa, for the work of converting the old Marine hospital into a college for naval cadets.

Specifications for tenders for the work on Halifax tower are being prepared.

Plans have just arrived from Ottawa for the Naval Academy. This is an extensive alteration to the Naval Hospital at the Dockyard for the use of the Canadian Navy and forms the nucleus of an extensive lot of work to be tendered for in the near future. It is also reported that plans will soon be out for a new office building at the Dockyard for the use of the Marine and Fisheries Department, to be built of brick. Tenders not yet awarded.

The Halifax Board of Trade have accepted the plans of Dumares & Cobb for a memorial tower in honor of Sir Sandford Fleming, to be erected in the park at the northwest arm. It is to be constructed of stone, with granite trimmings.

Moose Jaw, Sask.

The estimated cost of the Presbyterian Boys' College is $100,000, and private bids for the work will be accepted within a few weeks. J. D. Atchison, architect, Winnipeg.

Minnedosa, Man.

Tenders addressed to M. G. Williamson, this place, were received until September 16th for erection of school at Rookhurst, near here.

Mortlach, Sask.

The Church of England have decided to erect a new church here.

Medicine Hat, Alta.

The plans for the new St. Barnabas' Anglican Church have been accepted; 90 x 60 feet, brick, costing $22,000.

Montreal, Que.

Hon. Mr. Lemieux, postmaster-general, in a letter read before the Board of Trade, in answer to one of criticism on the condition of the old post office, replied that the matter had been laid before the Department of Public Works.

Nanaimo, B.C.

The sisters of St. Anne's hospital, Nanaimo, are collecting subscriptions for the rebuilding of their hospital recently destroyed by fire.

New Westminster, B.C.

Tenders for the Y. M. C. A. building will be called for as soon as the specifications have been approved. C. R. Sayer, travelling secretary.

Niagara Falls, Ont.

The General Hospital Board have decided to begin preparations for erection of Nurses' Home.

Ottawa, Ont.

Another golf club is to be formed. A meeting has been called to elect officers and select a site for the club house.

J. A. Ewart, architect, has submitted plans for the new Bethany Presbyterian church. It will seat 500 people and will be a solid brick structure. Estimated cost, $17,000.

Pembroke, Ont.

The Library Board here are arranging for plans for the new Carnegie Library. J. H. Reeves, secretary. Estimated expenditure, $12,000.

Portage la Prairie, Man.

Plans for the new armory here arrived. Two storeys, 54 x 68 feet.

Rock Bay, B.C.

The hospital here recently destroyed by fire will be rebuilt.

Rosetown, Sask.

A town hall and fire station are to be built at once.

Saskatoon, Sask.

A new Labor Temple is to be erected, three storeys and basement, 58 x 90 feet, cost $45,000. Plans by R. M. Thompson.

South Vancouver, B.C.

The plans for the new fire hall at this end of the city were accepted. Architect Borter will have specifications ready in a few days, at which time tenders will be called for.

St. Thomas, Ont.

The Y. M. C. A. will have a membership campaign this week, closing on Friday evening. This is preliminary to the building campaign which it is planned for next May.

Tenders will be received until October 1st by Reverend T. West, for masonry and plastering, carpentry and roofing, etc., required in erection of stone church here. Plans, etc., at office of the architect, A. W. Holmes, 10 Bloor street east, Toronto, or at the Presbytery, this city.

The building committee of the Board of Education will endeavor to get options on the Barr property, corner of Palm street and East avenue, with a view to the erection of a school on the north side. The committee will also ascertain the cost of securing new gorunds at the Scott street school, so that the grounds and the building may both be increased in size.

Smith's Falls, Ont.

The Department of Education has approved of the site selected by the school board for their new high school.

Dr. E. H. Wickware, Chairman of the Board of Education, will receive tenders up to the 29th inst. for the erection and completion of the collegiate institute building in this town. See advertisement in "Tenders and For Sale Department" of this issue.

St. John, N.B.

Specifications are being prepared at Ottawa for the drill hall. Tenders have not yet been called.

Thorold, Ont.

Tenders were invited until September 17 for work in connection with new addition to St. John's Church. Plans, etc., with the architect, T. H. Wiley, St. Catharines.

Tp. of Burke, Ont.

A by-law has been passed to issued $7,000 school debentures. H. McQuerie, clerk.

Toronto, Ont.

Permits were granted to the following: Boon Avenue Methodist Church, 2-storey church and Sunday school, $25,000; Board of Education, 2-storey brick school on Howard Park avenue, $[illegible],000, and 2-storey brick addition to school, Kingston road, $40,000.

The preliminary plans for the new technical school have been inspected by Mr. J. A. Houston, the government inspector of school buildings. Estimated cost, $500,000.

No tenders having been received for the erection of the new bird and monkey house at Riverdale Park, the park commissioner was instructed by the Board of Control to erect it by day labor.

The plans for the proposed art gallery and museum on Grange road have reached a definite stage. Work will not be commenced until the necessary land on St. Patrick and Beverley has been acquired. Estimated expenditure, about $150,000, of which about $40,000 has been already secured.

The congregation of St. David's Presbyterian Church, Earlscourt, have decided to extend the church accommodation by building a new Sunday school room. Plans are being prepared.

Property Commissioner Harris is looking for a site for a new jail with grounds, probably within ten miles from the city.

The firm of Shattuck & Hussey, Chicago, Ill., will be engaged as consulting architects for the new Y. M. C. A. buildings. Messrs. Burke, Horwood & White, local architects. General secretary, Warburton.

Tenders are being called until September 27th by Board of Control for hot water heating in connection with police station No. 9, West Toronto. Plans, etc., at office of City Architect. G. R. Geary, chairman, Board of Control.

Vernon, B.C.

This municipality is seeking an armory site, the Dominion authorities declining to erect a new drill hall on leased property.

Victoria, B.C.

W. N. Mitchell, real estate dealer, it is stated, intends erecting in the near future another block on Pandora avenue, off Douglas street.

Tenders have been invited by the Department of Public Works for the erection of a two-room school building at Howe Sound and a one-room school at Graham Island, the former being receivable up to the 26th inst., and the latter until the 10th of October. Tenders and completion of the new Court House at Kaslo, receivable until October 10th.

Welland, Ont.

Inspector Marshall, of the Public School Board, is of the opinion that additional school accommodation would probably be necessary by next summer.

Wynyard, Sask.

At a meeting on the 13th inst. it was decided to purchase land on McInnes street for a Presbyterian church and work on the cement basement will begin at once.

Winnipeg, Man.

A new provincial agricultural college is to be erected which will form another section of the farm education campaign being carried on by the Roblin government. It is also stated that the deaf and dumb institute will be rebuilt in the western suburbs of the city at an early date and that a prison farm will be inaugurated, a few miles to the south of the city on property recently purchased for the purpose.

A building permit was issued for the erection of Children's Hospital, $65,000; architect, J. H. G. Russell; contractor, W. J. Davidson.

It is reported that the present Manitoba Club Building will be sold to the G. T. P. and that a large new building will be erected elsewhere.

The Winnipeg Beach Club will have a new club house erected.

The government has concluded the purchase of [illegible] acres of land, located on the Red river in St. Vital, St. Norbert, about two and a half miles from the city limits. The property contains about [illegible] approximately. It is said all the government buildings, including the Parliament buildings, will be placed here.

The board of control is to call for tenders within the next two weeks for a two storey public swimming bath. The plans for this structure are being prepared by Wm. Bruce, architect, and the rough draft has been submitted. Estimated cost, $50,000.

Zealandia, Sask.
A new town hall and fire station is to be erected.

AWARDED.

Balgonie, Sask.
J. H. McDonald, Regina, was awarded the contract for addition to school on a bid of $5,365.

Calgary, Alta.
The by-law to spend $484,000 on railway extensions was carried.

Camrose, Alta.
Keyes & Baird secured the contract for buildings for Exhibition grounds.

Chatham. N.B.
The contract for the new Roman Catholic cathedral has been awarded to A. P. LeBlanc, contractor, of Moncton, N.B. It will be built of stone at a cost of $15,000,

Duncan, B.C.
The contract to build the Convalscent Home and Emergency Hospital has been let to L. Tinney, late of Vancouver.

Ottawa, Ont.
The contract for supply of electric light fixtures for the city hall was awarded to Garrioch & Gorard, Elgin street, at $183. P. Ackroye, 184 Bank street, tendered at $225. Architect, J. A. Ewart.

Strathcona, Alta.
Ald. Congdon was the successful contractor for the carpentry and masonry work in the improvements on Immigration Hall. S. Humeston tendered successfully for the painting.

Souris, Man.
Excavation work was started on the 12th inst. on the new post office. Piggott & Son, of Hamilton, Ont., are the contractors.

Saltcoats, Sask.
The contract for additiones to and remodelling public school here has been awarded to W. J. McCandless & Company and Crossley Bros, this place, at $8,060.

St. Mary's, N.B.
The contract for the Roman Catholic church has been awarded to A. P. LeBlanc, contractor of Moncton, N.B. It will be built of wood at a cost of $20,000.

Winnipeg, Man.
The city council has awarded contracts to the engineer of construction for the first wing of the hospital for advanced cases of tuberculosis and for the structure which is to encase the fire engine to cross the Red river, in William Whyte Park. The plans for the hospital are by Dr. Sharpe and the contract price, $23,507, which was $6,000 below the second lowest tender. The cost of the other structure will be $1,894.

The contract was let last week for the Children's hospital to W. J. Davidson at $65,000. The building is to be two storeys high and will be constructed of brick and reinforced concrete.

The contract for the electrical work on Young Church was let to J. H. Tooray, $1,650.

Residences

Chilliwack, B.C.
Gamble & Knapp, architects, Vancouver, submitted plans to A. N. Smith for the construction of a forty-roomed Swiss chalet at the Vedder creek, Chilliwack.

Chatham, Ont.
Recent building permits include: Chatham Fruit Growers' Association, 2-storey frame building, iron clad, 50 x 100, west side of Raleigh street, $5,000; Jos. Neff, 2-storey brick building, 26 x 30, north side of McKeough avenue, $2,000; William H. Wetsman, 2-storey brick building, 24 x 125, north side King street, $5,000; Knights of Columbus, 2-storey brick building, 24 x 125, north side of King street, $7,000.

Edmonton, Alta.
The following permits have been issued: Jas. Mathews, dwelling on 24th street, $3,000; J. Goldsbury, dwelling on Kirkness street, $2,000; K. A. Macleod, repairs to a dwelling on Macdougall avenue, $3,500.

Halifax, N.S.
Tenders are called for new residence for A. L. Meloin on Tower road. Dumaresq & Cobb, architects.

Ottawa, Ont.
C. P. Meredith is calling for tenders for a fine residence for Hon. Sidney Fisher on Salisbury avenue. It will be of solid brick.

Nimmo and Soper will erect three more residences on Carling avenue to range in value, including lots, at $6,800 to $8,000.

Among the recent building permits are: Fred Hunt, dwelling, Balsam street, $6,000; E. A. Parsons, dwelling, Ann street, R. J. Mackey, builder, $2,800; Wm. St. George, Russell avenue, dwelling, $3,000; R. F. Harris, Holland avenue, dwelling, $2,500.

Souris, Man.
J. Curtain has atsrted to build a residence.

Toronto, Ont.
W. T. Clarke will erect two residences on Dunvegan road. F. A. Wood, 47 Adelaide street east, effected the sale of the lots.

F. B. Robins, real estate dealer, has effected the sale of extensive suburban property lying south of Lake Shore road.

Vancouver, B.C.
Mr. J. A. Bealey will erect on Nelson street, between Thurlow street and Burrard street, a 32-roomed house. Estimated cost $18,000. Architect, Mr. G. A. Horel.

Victoria, B.C.
Permit has been issued to James Moggy for a dwelling to be erected on Battery street to cost $2,500.

Building permits have been issued to H. Bunting for a dwelling on Chamberlain street to cost $2,500; E. Hurst, dwelling on Graham street, $2,500.

Vancouver, B.C.
Building permits issued recently include: Akroyd & Gall, 525 Pender street, $6,000; J. W. Parker, 1463 Eleventh avenue east, $2,500; Vancouver Home Builders, Fifth and Macdonald, four houses, $7,200; Vernon Bros., 2143 Broadway west, 4 houses, $10,000; Parker & Allan, 2475 Seventh avenue west, $3,200; C. E. Smith, 2104 Slemin drive, four houses, $8,000; F. Buchanan, 2436 Seventh avenue west, $2,600; L. E. Chenier, 2406 Seventh avenue west, $5,000; W. W. Beard, 1786 Eleventh avenue west, $4,500; R. Stewart, 1336 Tenth avenue east, $3,000; F. Melton, 1736 Thirteenth avenue east, four houses, $6,400; Harvey & Dargavel, 2366 Seventh avenue west, two houses, $6,000; D. McArthur, 1106 Fifteenth avenue west, $3,200; J. Wickham, 1219 Barnard street, $2,600; Prudential Investment Company, two houses, 2026 and 2046 Fourteenth avenue west, $6,000; Mr. Price, dwelling, 1317 Walnut street, $3,200.

Winnipeg, Man.
Building permits issued recently include: J. Forseng, two houses, east side of Burnell, $4,400; A. Conde, house, east side of Beverly, between Notre Dame and Wellington, $2,700; W. Hanbury, house, north side Jessie, between John and Hugo, $2,500; E. E. Wise, two houses, north side of Rosser, between Hugo and Helen, $4,000; Paulin-Chambers Company, stable, east side of Paulin, between Ross and Pacific, $4,000; G. Baskin, dwelling, south side Roland and Grey, $2,000; J. F. Parker, four dwellings, Lipton, east side, between Portage and Buell, $10,000, dwelling, Raglan road, $2,800; W. J. McLoughlin, dwelling, Jessie, south side, between Hugo and Helen, $2,400; West End Realty Company, dwelling, Banning, west side, between Livinia and Einarson, $3,000; Ernest Marsh, dwelling, north side, between Salter and Powers, $2,000; David Jones, two dwellings, on Hetherington, south side, between John and Nasau, $3,600; Ridley Taylor, dwelling, Dorchester, south side, $4,000; Armstrong & Brown, dwelling, Horne, west side, $4,000; E. W. Andrews, dwelling, Chestnut street, $4,500; Rosedale Methodist Church, church, Beresford, $2,500; J. Isenburg, dwelling, south side Mulvey, $2,500, two dwellings, south side of Fleet, $5,000; Ven. Archdeacon Scott, dwelling, north side Jessie, $3,600; Mrs. H. B. Ketchen, dwelling, 111 Nasau and River, $3,000; Lewis Furniture Company, warehouse, west side McGee, $8,000; F. Lynn, dwelling, northeast corner Nasau street and Arnold avenue, $3,000.

AWARDED.

Brandon, Man.
J. A. Twiss has been awarded contract to erect residence for E. L. Stady to cost $6,000.

Ottawa, Ont.
The contracts have been awarded for G. L. Orme's residence at the Golf Club. A. Fahey has the masonry; E. J. Shuttleworth, the carpentering; W. J. Carson, the painting and glazing; Brooks & Davis, plastering; McCallum & Company, electrical work; M. M. O'Connell, plumoing and heating. W. E. Noffke is arcihtect.

J. P. Maclaren has been chosen architect for remodeling C. Stratton's residence, Cooper street. John Hague has been awarded the general contract.

Business Buildings and Industrial Plants

Balfour, B.C.
The local C. P. R. officials have received the revised plans for the tourist hotel here from the company's architects in Winnipeg. Approximate cost, $140,000.

Camrose, Alta.
The Sawyer-Massey Company have secured a site here and will build a warehouse.

Calgary, Alta.
Lang & Dowler are architects for W. R. Hall's new hotel.

Como, Que.
Hodgson's lumber mill and 400,000 feet of lumber were destroyed by fire on the 14th inst. Loss, $50,000.

Campbellton, N.B.
The I. C. R. Board of Management has

decided on the plans for extensive new railway buildings to replace those destroyed by the fire of last July. The total cost will be about $200,000.

Edmonton, Alta.

It is reported that the Hudson Bay Company may enlarge their store here and those in other western cities.

It is stated that the G. T. P. are considering the erection of modern hotels here and at Prince Rupert in time for the completion of the main line.

Fredericton, N.B.

We are informed that the work on the 3-storey Lanigan Factory and Tannery on York street for J. Palmer Company, Limited, will not be commenced until next spring. Materials, brick or cement; estimated cost, $25,000. R. W. McLellan.

Granby, Que.

The sash and door factory owned by M. Bruneau was destroyed by fire on the 18th inst. Loss about $50,000.

Grand Valley, Ont.

The McIntyre Block occupied by J. McIntyre & Sons was destroyed by fire on the 18th inst. Loss not stated.

Galt, Ont.

A by-law is being prepared to loan $15,000 to a manufacturing concern which is willing to locate in the town.

Halifax, N.S.

On the 16th inst. fire destroyed the buildings owned and occupied by Miss Fahie, grocery, A. Adams & Company, warehouse owned by Beamish estate.

Levis, Que.

A big hotel may be erected in Levis shortly. Mr. C. M. Colmay, of New York, is interested. Estimated expenditure, $1,000,000. Mayor Bernier.

London, Ont.

The following have taken out building permits: Mr. John Hayman, apartment house on Wellington street, $30,000; Flavelle & Silverwood, a three-storey warehouse on Bathurst street, $11,000.

Macleod, Alta.

The C. P. R. will erect a large dining hall annex to the depot here.

Mahone Bay, N.S.

Dumaresy & Cobb are asking for tenders for a new building at Mahone Bay for the Bank of Montreal.

Moose Jaw, Sask.

A company to be known as the Moose Jaw Dairy Company, has been organized and has secured a three-quarter section within three miles of this city. Construction has been commenced on the barns, in which the most up-to-date plumbing will be installed.

Montreal, Que.

The premises occupied by McArthur, Corneille & Company, paints and oils establishment, was damaged by fire to the extent of about $30,000 on the 16th inst.

The Royal Exchange Assurance Company has purchased property on the northwest corner of St. Francis Xavier and St. Sacrament streets, where it is understood they will erect a ten-storey building. The directors of the company include some of the leading bankers of London, Eng. Mr. Arthur Barry, Canadian manager.

J. J. Palmer, president of the Toronto Type Foundry, has completed the purchase of a site for a new warehouse which the company is to erect in this city next spring on Hermoine street, near Craig. A six-storey structure is to be erected.

New Westminster, B.C.

The Walsh Sash & Door Factory are planning the erection of a large factory, with a capacity of 1,000 feet per day. A small sawmill will be operated in connection.

The B. C. Packers' Association, if arrangements can be made with C. P. R., will erect a large addition to the Columbia Cold Storage Plant. Mr. Geo. Cassady, manager.

Ogemo, Sask.

The Union Bank of Canada has purchased lots here and will erect a branch shortly.

Ottawa, Ont.

A. W. Henderson, of Bruton, Somerset, Eng., has secured a site on McKay street, 100 x 155 feet, as the location for his patent saw factory.

The C. P. R. has notified the city of their project for extending its limits in the neighborhood of the Wellington street viaduct for the purpose of increasing the yard facilities and putting up new buildings. Vice-president McNicholl; Mayor, Hopewell.

The directors of Slinn-Shouldis Company, Limited, held a meeting last week, adopting the plans for the new bakery on Catharine street, and instructing James Mather, architect, to call for tenders at once.

The Bank of Hamilton has purchased 120 feet of property at the corner of Princess street and William avenue for $75,000. It is stated the bank intends to build a handsome financial edifice upon the site next year.

W. E. Noffke, architect, is calling for tenders for the steel work in the Blackburn Building, corner of Sparks and Metcalfe streets. The present buildings are being demolished and the excavation is being done by day labor.

Building permit was issued to J. E. Taggart for solid brick office building, $12,000.

Peter Farah sold a property on corner of York and Dalhousie streets, 137 by 246 feet, for $40,000. He had expected to erect a commercial block on this site and it is understood that the new owner is in negotiation with a syndicate to erect such a building.

M. Landreville contemplates erecting a three-storey building, with two stores on the main floor, and flats above, on Clarence street.

Dr. J. E. Taggart will erect an office building with stores and a theatre on the ground floor, at the corner of Little Sussex and Besserer street. The estimated cost is $12,000. The building will be 60 feet on Little Sussex, 78 feet on Besserer, and the side farthest from Little Sussex will be 100 feet. It will be erected by day labor chiefly. Weeks & Keefer are the architects.

M. C. Edey, architect, has been instructed to prepare plans for a store house and mill for the Maple Leaf Milling Company to be erected on Broad street. The building will be 148 feet by 55 feet, one storey high. The foundation will be of concrete, the front of brick and the remainder ironclad. Tenders will be called for soon.

Port Mann, B.C.

D. McRae, of the Canadian Northern Railway, has announced that car building shops for the entire system, employing 5,000 men, will be erected here.

Penticton, B.C.

Outside capitalists are negotiating with the council for a large site on the Esplanade reserve for the location of a box manufacturing company.

Port Hope, Ont.

The International Tool Steel Company, Limited, in return for civic privileges, will erect four buildings here. Estimated expenditure, $35,000. J. E. Murphy, president; Mr. Chapman, representative. Mayor, Mr. Mulholland.

Preston, Ont.

Clare Bros. & Company intend to enlarge their factory considerably, the adjoining property having been purchased. Work may not start until next spring.

A by-law to give certain privileges to Baetz Bros., formerly of Galt, will be submitted to the ratepayers on October 10th. A large factory will be erected.

Qu'Appelle, Sask.

The Moore Milling Company will erect a flour mill to replace the one recently burnt down.

The Bulyea block, owned by P. Bears, destroyed by fire will be rebuilt.

Regina, Sask.

A permit was taken out by the National Drug & Chemical Company for their new $25,000 warehouse. Simpkins Bros. are putting an $18,000 addition to their store.

Stoney Mountain, Man.

L. P. Brault & Sons' store, which was burnt down, will be rebuilt.

Sarnia, Ont.

The council are in communication with Mr. F. A. Case regarding the establishment of a collar factory here. In return for civic privileges the latter will erect a building, 40 x 100 feet, and employ about 300 persons.

Sault Ste. Marie, Ont.

The directors of the Lake Superior Corporation have decided to expend the sum of $12,000,000 during the present year on extensions to the steel plant, railway construction, as well as on the company's mines and forests.

Trenton, Ont.

The cooperage mills here were destroyed by fire on the 8th inst. Loss, $15,000.

Toronto, Ont.

F. B. Robins, president of Robins, Limited, has purchased the corner of Victoria and Richmond streets, where he will erect a large steel and concrete building.

Permits were granted to C. S. Boone for a 2-storey brick warehouse, $10,000; Smith Manufacturing Company, 2-storey brick factory, Campbell and Sarnia streets, $25,000; Gelber Bros., 4-storey brick warehouse, corner Richmond and Duncan, $30,000.

Plans are under way for the construction of a new 8-storey building on Victoria street for the Imperial Life Insurance Company. Architects, G. M. Miller & Company.

Vancouver, B.C.

T. E. Julian is the architect for the Royal Bank of Canada being erected, corner of Westminster avenue and [illegible] street. Estimated cost, $25,000.

A permit has been granted to Mr. W. T. Whiteside for the erection of a six-storey warehouse on Water street, $45,000.

Victoria, B.C.

Mr. C. Kocot, from Sault Ste. Marie, will erect a cooperage factory here for which the estimated expenditure will be about

(Continued on page 28)

Tenders and For Sale Department

Tenders Wanted

Separate or bulk tenders will be received by the undersigned, sealed and marked ''Tender for Town Hall,'' until SATURDAY, 22ND OCTOBER, at 4 o'clock p.m., for the erection of a new Hall Building in the Town of Hanover.

Plans and specifications may be seen at my office, Hanover, and at the office of Forster & [illegible], Architects, Owen Sound.

The lowest or any tender not necessarily accepted.

JOHN TAYLOR, Town Clerk,
Municipality of Hanover.

September 12th, 1910. 39

Tenders Wanted

Separate or bulk tenders will be received by the undersigned, sealed, and marked ''Tender for Public Library,'' until SATURDAY, 22ND OCTOBER, at 4 o'clock, p.m., for the erection of a Public Library Building in the Town of Hanover.

Plans and specifications may be seen at my office, Hanover, and at the office of W. E. Binning, arcihtect, Imperial Bank Building, Listowel.

Tenderers to state what allowance will be made for brick building now on the premises.

The lowest or any tender not necessarily accepted.

JOHN TAYLOR, Town Clerk,
Municipality of Hanover.

September 12th, 1910. 39

Tenders Wanted

Bulk and separate tenders for all or any of the different branches of work and material required in the erection and completion of a

Bank and Office Building

to be erected in Brantford for the Imperial Bank of Canada, will be received up to 12 o'clock noon, TUESDAY, SEPTEMBER 20TH, 1910. Plans and specifications may be seen at the office of

TAYLOR & TAYLOR, Architects,
Hope Chambers, Brantford, Ont.

Lowest or any tender not necessarily accepted. 38

City of Moose Jaw,
Saskatchewan

Tenders

Tenders will be received by the undersigned up to 8.30 p.m. on MONDAY, OCTOBER 10TH, for supplying (for the use of the City Fire Department), one standard combination chemical and hose wagon with capacity 50 gallons chemical tank and 800 feet of 2½-inch fire hose, or 40 gallons chemical tank and 1,000 feet of 2½-inch fire hose. Wagon to be fitted to carry one 20-foot extension ladder on top.

Tenderers are asked ot quote prices for either 2½-inch steel or 2½-rubber tired Archibald wheels; also for one extra set of Archibald wheels, 1⅞-inch axle, 2½-inch steel or rubber tires.

Tenderers are asked to furnish detailed specifications and cut of wagon and equipment, and give price f.o.b. Moose Jaw.

The lowest or any tender not necessarily accepted.

W. F. HEAL,
City Clerk.

Moose Jaw, September 10th, 1910. 39

To Contractors

Sealed tenders, separate or bulk, will be received by the undersigned up to 12 o'clock noon on THURSDAY, 29TH INST., for the erection and completion of a Collegiate Institute Building in the Town of Smith's Falls, Ont. Plans and specifications may be seen at the office of the secretary-treasurer, Board of Education, Smith's Falls. A deposit of five per cent. must accompany each tender, or the names of two responsible persons who are willing to become sureties for the due performance of the above mentioned works.

The lowest or any tender not necessarily accepted.

DR. E. H. WICKWARE,
Chairman, Board of Education,
39 Smith's Falls, Ont.

Tenders

Church of Holy Angels
St. Thomas, Ont.

Tenders will be received by the Rev. T. West, St. Thomas, Ont., until 5 o'clock on SATURDAY, OCTOBER 1ST, for the Masonry and Plastering, Carpentry and Roofing, etc., required in the erection and completion of a stone church at St. Thomas, Ont.

Plans and specifications may be seen at the office of the undersigned and also at the Roman Catholic Presbytery, St. Thomas.

Security to the extent of one-third the amount of contract will be required for the faithful performance of the work.

The lowest or any tender not necessarily accepted.

ARTHUR W. HOLMES, Architect,
39 10 Bloor St. E., Toronto.

Tenders Wanted

Town of Barrie, Ont.

Sealed tenders addressed to the Town Clerk will be received up to noon of the FIRST DAY OF OCTOBER, 1910, for the construction of main street sewers. The work will be let in four sections and tenders received for one or more sections.

Contract A.—Clapperton Street. Approximately 2,077 feet, 10-inch pipe. 5manholes, 1 Flush Tank.

Contract B.—Small Street. Approximately 1,675 feet, 10-inch pipe, 3 manholes, 1 Flush Tank.

Contract C.—William Street. Approximately 713 feet, 8-inch pipe, 1 Manhole, 1 Flush Tank.

Contract D.—Bradford and Ross Street West. Approximately 1,738 feet, 12-inch pipe, and 746 feet, 8-inch pipe, 6 Manholes and 2 Flush Tanks.

Plans and specifications may be seen at the office of the Town Clerk, Barrie; at the office of the ''Canadian Engineer,'' Toronto, and at the office of the engineer, Collingwood, after the 17th of September.

All tenders must be sealed and plainly marked as to the work tendered on. The lowest or any tender not necessarily accepted.

K. S. MACDONELL, THOS. BEECROFT,
39 Engineer. Barrie, Ont.

City of Prince Albert

Tenders

Sealed tenders addressed to the undersigned and marked ''Tender for Pumps,'' will be received until noon on FRIDAY, THE 30TH DAY OF SEPTEMBER, 1910, for the supplying and erection of two (2) Centrifugal, Electrically Driven, Automatic, Control Sewage Pumps.

Specifications may be secured from the City Engineer of the City of Prince Albert.

The lowest or any tender not necessarily accepted.

C. O. DAVIDSON,
City Clerk.

Dated at Prince Albert Sask., August 31st, 1910. 39

Positions Wanted

Advertisements under his heading one cent a word per insertion. Box No. ten cents extra

ENGLISH ARCHITECT AND SURVEYOR of seven years' experience, will arrive in Toronto in October, and will be open to engagement as assistant. Age 25. References. Address ''E. B. B.,'' care CONTRACT RECORD. 39

Miscellaneous

Advertisement under this heading two cents a word per insertion.

STEEL RAILS FOR SALE.—One hundred tons of steel rails, 56 pounds to yard. Will be ready for delivery early in October. Apply Box 134 CONTRACT RECORD, Toronto. 38

Business Buildings and Industrial Plants

(Continued from page 27)

$100,000. Vancouver Island Development League was instrumental in directing his attention here.

Tenders were called on September 17th for erection of a three-storey brick buildings on Fisguard street for Lee Mong Kow and Lee's Benevolent Association. C. E. Watkins, architect.

Permit was issued to Grand Trunk Pacifice for their new brick and stone ticket office, $5,500. Architect, J. C. M. Keith; contractors, Dinsdale & Malcolm.

The Union Bank of Canada has purchased a site at the corner of Government street and Trounce avenue for a price in the neighborhood of $150,000, on which will be erected handsome banking premises. Mr. G. H. Balfour, general manager, Mr. H. B. Shaw, assistant general manager, and Mr. F. W. S. Crispo, superintendent of western branches.

White Rock, B.C.

White Rock has been destroyed by fire. Loss estimated at $20,000.

Woodstock, Ont.

The ratepayers carried by-laws offering inducements to the Linderman Machine Company and the Fibre Board Folding Company.

Windsor, Ont.

Plans are being prepared for the new exchange for the Bell Telephone Company here. Site has been purchased on Goyeau street.

Winnipeg, Man.

J. Graham, of this city, will build a $15,000 block of stores and apartments in Norwood.

It is reported that an extension will be built to Reidle's Brewery at Elmwood.

President Wm. Mackenzie is authority for the statement that the C. N. R. will begin shortly to build the proposed hotel here to cost $2,000,000 on the corner of Water and Main streets. Pratt & Ross, architects.

The building occupied by the Manitoba Clothing Company, collapsed through the foundation giving way. Excavation next door is given as the cause. Estimated damage, $150,000.

Tenders are called until September 26th by C. P. R. for construction of brick ice house here. Frank Lee, division engineer.

Yarmouth, N.S.

The Royal Bank of Canada has purchased a building site on Main street, where it is understood it will erect a modern four-storey building.

AWARDED.

Montreal, Que.

The contract for the construction of the new station and hotel at Place Viger has been awarded to Messrs. John Stewart & Company.

Ottawa, Ont.

Paisley & Chisholm have been awarded the contract for furnishing the inside terra cotta for the Rosenthal building. About 80,000 blocks will be required.

The contract for the Workman-Warde Building will be let this week by H. E. Matthews. Mr. Matthews, who is the architect for the Speirs-Parnell bakery, announced that that contract will be let within a few days, tenders already having been secured.

The contract for the masonry work on the basement and foundation for the Imperial Oil Company's office building on Logan avenue and Trinity street, has been let by the architect, J. H. G. Russell, to John Delman. It was expected that this building would be erected this year, but the strike and lockout decided the builders that the main building would be left over until next spring.

Riverside, B.C.

The contract for the erection of a hotel at Riverside, B.C., near Proctor, has been awarded to Messrs. C. W. Sharp & Son, Winnipeg. Cost $150,000. W. W. Blair, architect.

Toronto, Ont.

The Dominion Bridge Company has the contract for the steel work in the erection of Hobberlin's building, corner of Richmond and Yonge streets. Total expenditure reported as $150,000.

Vancouver, B.C.

The contract for wrecking the old building at the southwest corner of Hastings and Seymour streets and excavating for the foundations and basement of the proposed Bank of Ottawa office building on the same site, has been awarded to Campbell Bros. of this city. Work was started recently. Estimated cost, $300,000. Tenders for the foundations and superstructure will close shortly.

Victoria, B.C.

The contract for the office building of the G. T. P. Company has been awarded to Dinsdale & Malcolm. The part of the structure below Wharf street line is to be built of stone and of brick for the one storey above the roadway.

Permit was given to the Victoria Terminal Railway for the erection of depot and sheds on Blanchard street. Messrs. Dinsdale & Malcolm have been awarded the contract for $17,800.

Walkerville, Ont.

The general contract for the 3-storey, 80 by 90 feet, foctory for the Ford Motor Car Company, has been awarded to Wells & Gray Company, of Toronto; cost $21,000. Albert Kahn & E. Wilby, Detroit, Mich., architects.

Winnipeg, Man.

The contract for the warehouse for the W. J. Guest Fish Company, to be built on Alexander avenue, was let this week by Jas. Chisholm & Son, architect, to Carter-Halls-Aldinger at $18,000.

Power Plants, Electricity and Telephones

Brockville, Ont.

Tenders are being called for debentures to be issued for the light and power department.

Edmonton, Alta.

Engineer Fielding, who has been appointed by the city to investigate the Athabasca river power proposition will renew his conference with City Engineer Latornel shortly. Mr. Fielding will likely start about the 20th of the month for the scene of operations and will take with him a party of about three. It is thought that it will be possible to harness several of the falls on the Athabasca river, including Grand Rapids, Pelican Rapids, Stony Rapids and the Rap du Joli Falls. Grand Rapids is about 25 miles north of the Rap du Joli Falls, while the others are about six miles apart.

Fort Saskatchewan, Sask.

Tenders are being considered for machinery and electrical equipment for hydro-electric plant at River Sturgeon. Construction on the dam has commenced. Thos. J. Stacey, secretary-treasurer.

Rouleau, Sask.

Tenders will be received until October 1st for construction of the Adelaide telephone line from Rouleau in a northwesterly direction. Tenders will also be received for supply of material. Plans, etc., at Department of Telephones, Regina. F. R. Fitzpatrick, secretary-treasurer.

Toronto, Ont.

R. T. Fleming, manager street railway, has issued orders for the laying of rails on the streets. Work has been commenced at corner of Harbord and Ossington avenue. Estimated cost, $30,000 per mile.

Surveyors and engineers have about completed their work of locating the best available route for part of the electric railway for the district east of Toronto. The company which is undertaking the construction of the line, secured a franchise at the last session of the Dominion House enabling it to construct a line from Brockville to Toronto. It is stated that this fall tenders for construction of the line will be called for, and even some of the work may be done before the snow comes. In the early spring it is expected work will be rapidly pressed on, and part of the line be opened in the late summer of next year.

Windsor, Ont.

See "Business Building."

AWARDED.

Regina, Sask.

A tender for steel switches for the new steel railway was received from United States Steel Product Company and the contract awarded to them.

Miscellaneous

Dundas, Ont.

No tenders were received for the dredging of Desjardins Canal. J. F. Armour, engineer in charge.

Montreal, Que.

The Board of Control has instructed Fire Chief Tremblay to inspect the tender from the Watrous Company for a new steam fire engine to cost $5,300. The tender from Merriweather & Company, whose cheque, however, was not enclosed, was for $6,500.

Recent building permits include: A. Michaud, 1259 Des Erables street, house containing six dwellings on Rachel street, $3,000; John Allan, 354 St. Catherine street west, a four storey store building, $33,000; Marson & Freres, Notre Dame street, three houses containing nine dwellings on Ste. Elizabeth street, $10,000; Damien Lalonde, 1234 St. Lawrence Boulevard, three houses containing eight dwellings and one store, Dufferin street, $6,000; D. Labelle, 796 Drolet street, house containing six dwellings, St. Georges street, $4,000; O. Morin, Brown street, house containing four dwellings on Brown street, $4,000; A. Levesque, 3072 Berri street, house containing two dwellings on St. Denis Boulevard, $3,000; A. Louette, 633 Bourbonniere street, four houses containing twelve dwellings, $12,000; H. B. Woodrow, Longueuil, a 2-storey house on Prudhomme avenue, $5,000.

Nanaimo, B.C.

Tenders are invited for the construction of a concrete dam, two miles from the city. Particulars with City Engineer.

Truro, N.S.

A company called the Maritime Engineering Company, Limited, has been incorporated under the Nova Scotia Companies' Act, to carry on the manufacture of castings and general machinery here or at Belmont.

Toronto, Ont.

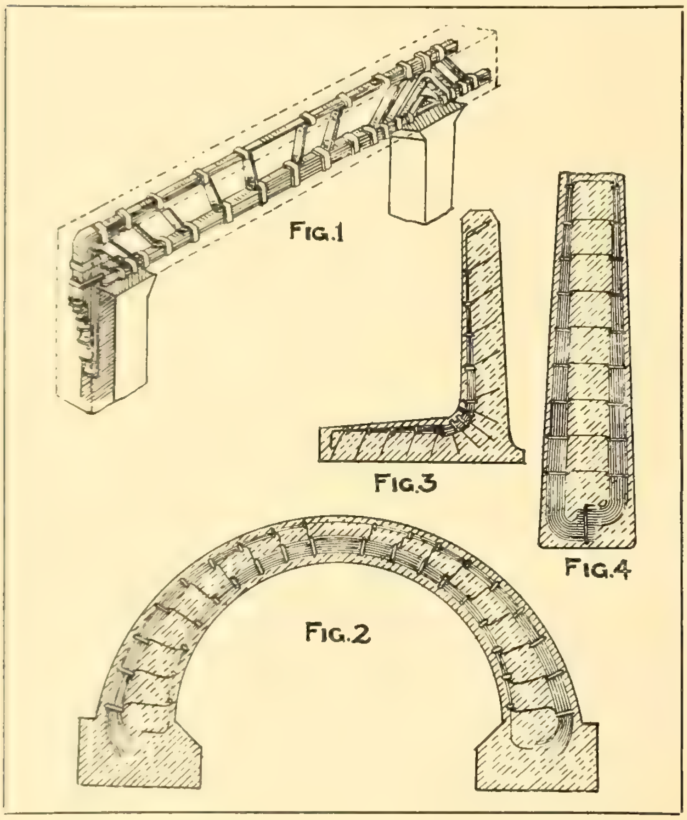
Recent building permits include: Robert Beatty, pair semi-detached 2½-sty. brick dwellings, Marmaduke, $5,000; John Walkey, pair semi-detached 2-sty. brick dwellings, Halton street, $4,000; Jas. A. Courtice, pair semi-detached 2-sty. brick dwellings, Gerrard street, $4,000; W. E. McLaughlin, pair semi-detached 2-sty. brick dwellings, Wroxeter, $4,000; M. B. Bentley, 2 detached 2-sty. brick dwellings, Quebec, $4,000; J. T. Myth, 4 attached 2-sty. roughcast dwellings, brick fronts, Carlaw avenue, $6,000; Fred Smith, 2-sty. brick dwelling, near Indian road, on Hewitt, $4,000; H. J. Rea, 2-sty. and attic brick dwelling, Indian road, $5,500; H. S .Mara, 5 attached 2-sty. roughcast dwellings, brick fronts, St. Helen's avenue, $4,000; Scott & Spark, pair semi-detached 2-sty. brick dwellings, Crawford, $4,000; Imperial Varnish & Color Company, [illegible] paint factory, Morse street, $6,000; C. H. Dies, 2 detached 2-sty. brick dwellings, 126 Kenilworth avenue, $5,000; D. Todd, pair semi-detached 2-sty. roughcast dwellings, brick fronts, Franklin avenue, $4,000; J. J. Downey, 2-sty. and attic brick dwelling, Walter, $4,000; Mrs. C. Goode, 2½ sty. brick dwelling, [illegible]; H. Goode, pair semi-detached 2 sty. brick dwellings, and 2 de[illegible] dwellings, [illegible]cora, $11,000; Mrs. B. M. Weaver, 4 attached 2-sty. roughcast dwellings, Northern Place, $4,000; J. M. Walker, pair semi-detached 2½ sty. brick dwellings, Sunnyside, $6,000; Eyre & Reid, pair semi-detached 2-sty. brick dwellings, Concord, $5,700.

The Burrowes Patented System of Reinforcement for Concrete

This reinforcement consists essentially of the novel arrangement of a plurality of flat bars of steels, whereby the sectional area of metal is distributed in proportion to the strains to which the reinforcing member is subjected, and whereby the shear members form a continuous part with the tension members.

This reinforcement was developed with the object of having a reinforcing member which could be disposed economically in various forms of structures with scientific accuracy, to add the greatest sustaining strength to the structure, to eliminate the necessity of special machinery in the formation of the reinforcing members, to eliminate all joints in the said members, and to provide a reinforcement of cheap construction, not readily injured in the transportation.

In the attached illustration are shown, greatly exaggerated, views of this reinforcement applied to different constructions. Fig. 1 is a perspective view of the reinforcement adapted to a plain form of beam, extending between and over the supports shown. It is not, of course, necessary for the reinforcement to be carried over the supports into the next span as shown, but it may be found more economical or convenient to do so, where the span is short. Fig. 2 is a sectional view, showing the arrangement of the reinforcement as applied to an arch. Fig. 3 shows the arrangement for reinforcing a retaining wall. Fig. 4 is a sectional view, showing the arrangement of the steel for reinforcing concrete poles, to replace wood and steel ones on transmission lines, telegraph and telephone lines, etc.



The Siemens Dynamo Works, of London, Eng., are in correspondence with the Ottawa city authorities with a view to sending their purification expert, Dr. Frank, to the federal capital to explain the firm's system of treating water by ozone. Mr. Herbert, the Canadian representative for the company, contends that the report on the Lindsay plant was of little significance. He states that his company has installed many plants in Europe with absolute success. In view of the fact that Mr. Allen Hazen, the New York expert, is expected to report upon the whole question of Ottawa's water supply within a few weeks, it is improbable that any action will be taken at present.

Excavating in Wet Sand

Manhole excavations in wet sand are handled readily by the Commonwealth Edison Company, of Chicago, by using hand-operated well-point pumping outfits. A threaded 2-inch tee is screwed into the suction of a Goulds diaphragm pump. Attached to this tee is a 2-inch manifold pipe fitted with six 1½-inch branch pipes. Each branch carries a globe valve so it can be cut out separately. A 12-foot length of 1½-inch pipe with a Cook well point on the end of it is connected to each branch by a hose. One of these points is driven at each corner and two near the centre of the excavation. In most cases one man working the pump is able to lower the water level and keep it below the bottom of the hole. Where the amount of ground water is excessive two men work on the pump. When a job is finished the pipes carrying the well points are drawn and disconnected. The pump and manifold pipe can then be delivered on a wheelbarrow to an adjacent job, since two men can lift it readily.

The several increases in the estimated cost of the construction of the Panama canal aroused the usual run of jibes about such work always running heavier in cost after it was well started. But there will be much less comment made upon a late change in estimate. The amount of excavation needed has been increased by 7,000,000 yards, but it is expected to add this amount of work without increasing the cost over the estimate. This is possible because the work has proved to be costing less than the estimate. The engineers in their estimates, made them heavy enough to allow for unseen contingencies, and they have been fortunate in being able to carry on the work at lesser expense. They are entitled to full credit for the accomplishment. The cause for increasing the excavation is due to the facts, developed since the excavations were well along, that a greater width was necessary to avert slides of earth, upon the completed work.

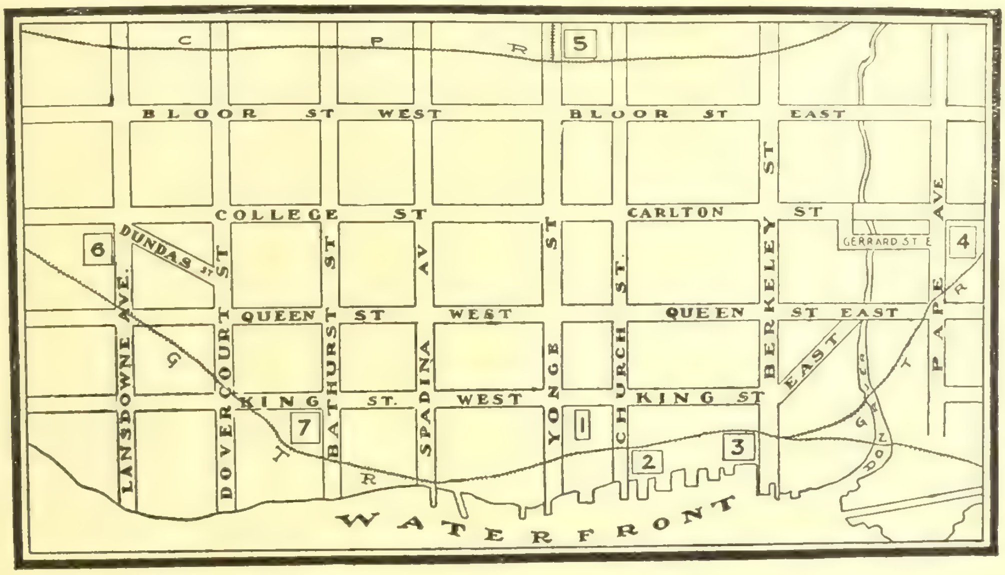
A six-storey reinforced concrete building, in Boston, for the use of an automobile company, has circular columns of the same diameter in the upper and lower storeys and has a long span floor construction permitting a deep turntable well of large diameter in each storey. The exterior faces of the walls are relieved by panels and mouldings integral with the body of the wall. The front wall corresponds with the brick and stone face of an adjacent building and has a rather elaborate trimming of cornice, dentals and carved stone, all of which, except the last, are cast integral with the body of the wall. The surface of the concrete will be dressed to resemble cut stone. The window sills are large blocks of artificial stone cast at the contractors' yard.

The approximate value of buildings erected at Toronto from January 1 to August 31, 1910, was $13,486,973. For the same period in 1909 the total was $12,018,812. The figures for August, 1910 and 1909 were respectively $1,713,040 and $1,335,332.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5



No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

CONTRACTORS' PLANT

BOILERS

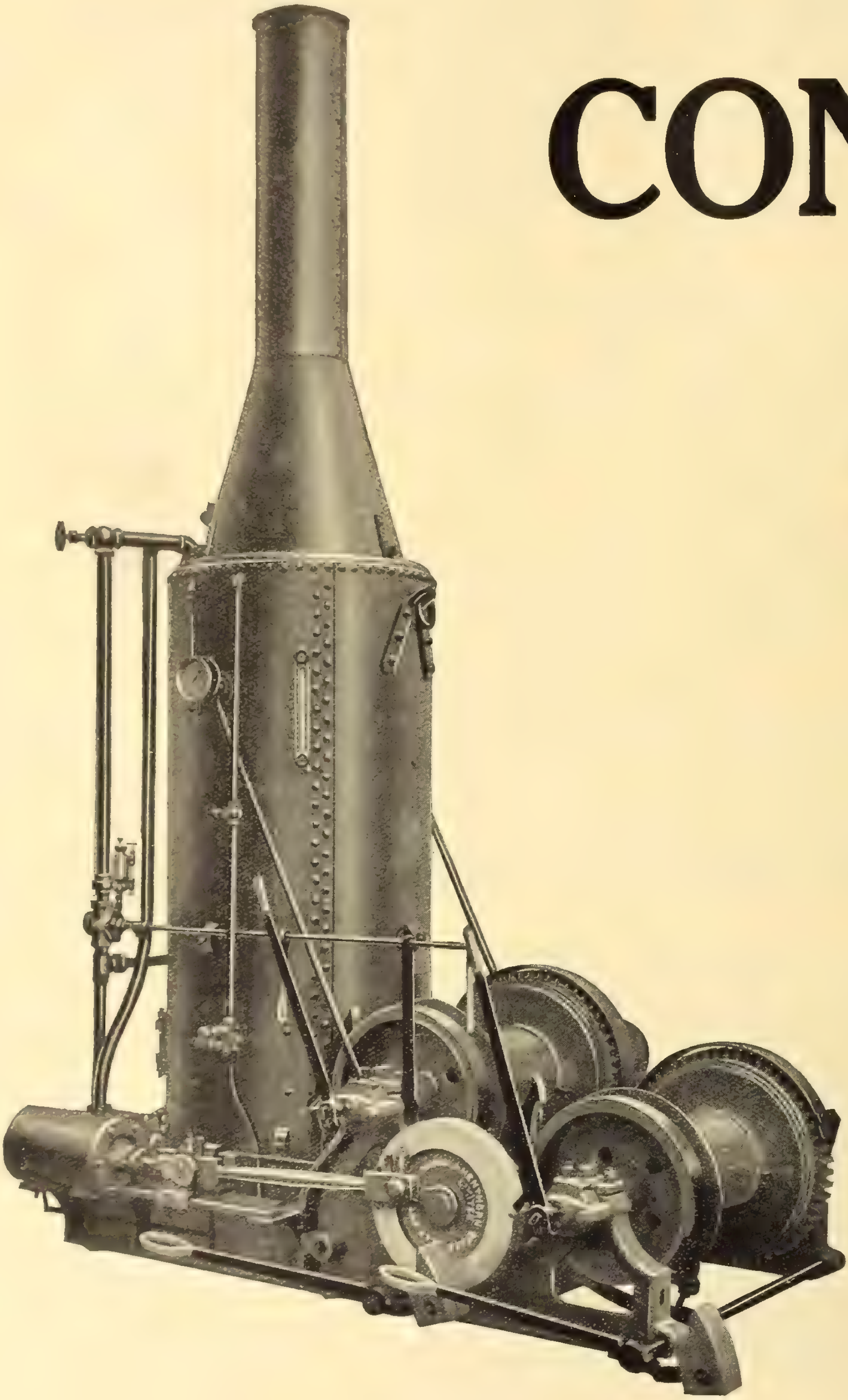
PUMPS

TANKS

CONDENSERS

WORKS: MONTREAL

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
Limited



CONTRA

HOIS

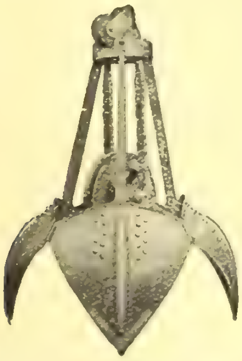
All Cap

and St

Head Offices and Warehouses :
Montreal

MUSSEN

TORS’

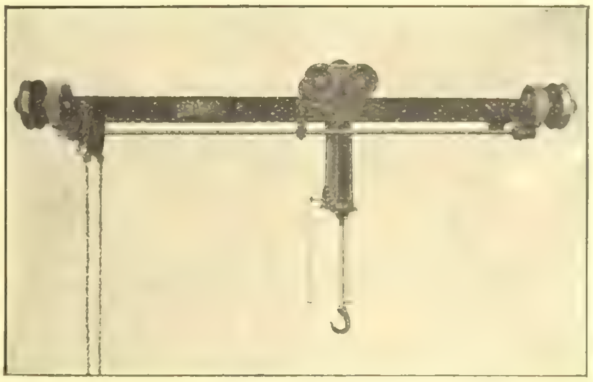


Orange Peel and Clam Shell Buckets

Cableways, Wire Rope, etc.

es

Reading Multiple Gear Chain Hoists



Cranes, Trolleys, etc.

Write for Catalogues and Prices

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's French Caen Stone Finish

We are now preparing this material, which, when applied, is the color of the selected Caen Stone, having the texture and life of real stone.

We do not wish our Caen Stone Finish to be confused with paints and other poor imitations of Caen Stone, it being a durable, heavy pigment, with a stone base, so closely imitating the Caen Stone that it is difficult to distinguish the real material from our Finish.

Our material can now be had at a very much less cost than the imported article, owing to the heavy duty and freight charges on the Finish brought from France.

French Caen Stone Finish can be applied to cement, plaster, brick, wood or metallic surfaces, producing a surface as hard as the original stone itself. This product is intended for the highest class decorative work and produces most excellent results upon walls, ceilings, wainscotings, fire-places and, in fact, wherever the French Caen Stone itself would be used. It is applied by means of a brush over our Alkali-Proof Wall Size and where the surface is very uniform and well built, two coats produce a very good result, while with three coats a heavier film of the material is developed, producing a beautiful finish. This material can also be "blocked off" or "stoned down" where an extremely fine effect is desired.

Covers 150 square feet to gallon and upwards, according to surface.

Specifications.

When applied to cement, stucco brick and similar surfaces, apply a coat of Alkali Proof Wall Size, followed with two or three coats of French Caen Stone Finish (according to finish desired). Work the material well into the pores by means of a suitable brush. Allow three to four days between coats under favorable temperature conditions, preferably 70° F. Level off the coats by means of No. 1 sand paper or suitable rubbing stone, care being taken not to rub through the coat. Have the material very thoroughly mixed and stirred before using, and occasionally while being used, in order to obtain best working and uniform covering properties.

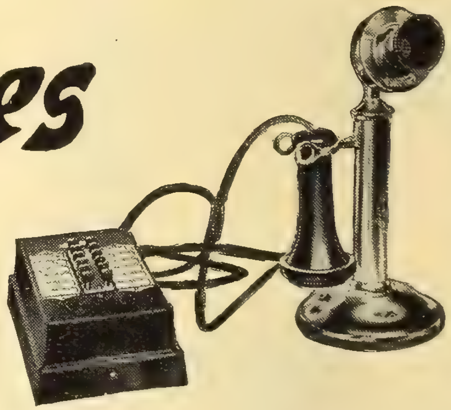
When applied over metallic or wood surfaces use the same specifications, eliminating the Alkali Proof Wall Size.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio
Distributed in Canada by
Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

THE NORTHERN ELECTRIC AND MFG. CO. LIMITED · FIRE ALARMS · TELEPHONES SUPPLIES

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.


No. 2016 Type-Metal Inter-phone for desk use

PRESIDENT
MANAGER
SUPT.
GEN. OFF.
SALES DEPT.
ANS.
V. PRES.
TREAS.
SEC'RY.
SHIP. DEPT.
FOREMAN
STOCK DEPT.
No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto September 21, 1910 No. 38

Satisfactory Conditions Prevailing

As will be noted by the building returns from various cities, there has been no general subsidence in construction this fall. As might be expected there is a certain amount of hesitancy in regard to the preliminaries for the larger projects, but the conditions generally are satisfactory and the outlook for fall business is good. The supply market is holding its own in pretty good shape and there has been practically no indication of any slump in prices. Cement, iron, brick and other materials are holding steadily. Maintenance of the prices now obtaining will, of course, be governed greatly by temporal conditions.

A Perennial Observation

It would seem that the ultimate economy and satisfaction derived from an adequate advertisement of projected work are advantages not yet sufficiently appreciated by the average municipality. If the purpose of these advertisements is to stimulate competition for the work and to secure the completion thereof at the lowest price consistent with good workmanship, it is certainly essential that they be published well in advance so as to give everybody a chance not only to put in a figure but to put in the best figure possible after a thorough investigation of the requirements. The city of Toronto does not offend frequently in this respect, but last week an advertisement appeared calling for tenders for transformers, pole line supplies, storage batteries and motor generator sets, the same to reach the chairman of the Board of Control by September 20th. The advertisement was dated at the City Hall September 11th but we believe that its first insertion in a Toronto paper was on September 16th. It may be that the authorities had a pressing and unforeseen need of the supplies in question and that they considered that they would get all the competition needed from local sources, but even in such case it seems to us that an extra week or so might have been allowed with a little foresight.

Nowadays everything depends upon competition, but especially is this true in municipal circles where everything tending towards monopoly must be discouraged. In the case of important contracts the opportunity to figure should be extended not only to American concerns—and certainly to British firms, but also to the leading European supply houses.

"Improved" Methods of Transporting Mixed Concrete

"Concrete is conveyed into place by wheel-barrows, carts, cars or buckets." This statement from a well known text book summarizes current practice with a fair degree of accuracy, says "Engineering-Contracting," our Chicago contemporary. It is interesting to note, however, that improvements in methods of transporting concrete have been recently undertaken by a number of contractors and others engaged in concrete work. Doubtless the prevailing methods named by the text book have features open to criticism. They are comparatively slow and rather expensive in labor and plant charges and, because of the runways and trestles required, are somewhat of a hindrance to other operations. On the other hand, they are adaptable to a wide range of conditions, and this cannot be truly said of the improvements that have been offered. We are reminded of these matters by a number of jobs of concrete work which have incidentally come under our personal observation where unusual methods of handling concrete from mixer to forms are being employed.

In some of the recent concrete building work in Chicago concrete has been distributed from hopper towers to floor and column forms by means of gravity chutes.

Gravity chutes obviously involve certain requirements as to elevations with which it is often inconvenient to comply and this has led to various attempts to secure means of making the concrete flow on level grade or even up-grade. The editors recall an instance some years ago where concrete was conveyed some scores of feet at nearly level grade in a temporized V-shaped trough by stationing men with shovels at intervals along the trough, these men keeping the concrete moving by "paddling." In a large building work recently noted practically the same method was employed except that, instead of men with shovels, mechanically operated paddles were used.

Briefly, the conveyor consists of four sections of V-shaped steel troughs, each about 25 feet long. Into one end of this trough the concrete is discharged from a hoist tower hopper, and from the other end of the trough it flows into the forms. The trough is supported at approximately a level grade, and above it and over its centre is supported a rod having a reciprocating motion of about 30 inches. To this rod at intervals of about 20 inches, are attached downward extending shovel blades which reach nearly to the bottom of the trough. These shovel blades are so hinged that they stand rigid during the forward stroke of the reciprocating bar, but during the return stroke will tip up and ride over the concrete. The reciprocating bar is operated by a small motor located at the hoist tower. The trough is pivoted to the hoist tower so that it can be swung over a wide area and is supported by guys from the tower and by wooden braces underneath. We are informed that with this arrangement 180 cubic yards of concrete have been placed in their forms in 12 hours with only one man tending the conveyor, levelling and tamping. It will be seen that about 100 feet is the conveying distance at which this device has worked. A 7 h.p. motor was sufficient for its operation.

A conveyor of the type described is obviously restricted to grades rising only very slightly above level. For steeper runs, as most of our readers know, use has been made of belt conveyors and in a future issue we shall give some account of such a plant, accompanied by cost data. One disadvantage of belt conveyors which has been noticed on several pieces of work is the slopping over the belt edges of the concrete. This means some waste, but far the greater objection is the hardening of the slopped material about the conveyor mechanism, and on the ground or structure underneath. In one case recently observed there were series of hardened concrete cones standing as high as a man's head all along under the belt. A remedy for this was found by mixing the concrete quite dry for conveying and wetting it down at the distributing point for placing in the forms. In most cases where belt conveyors have been made for concrete the conveyor construction and operation have not been well studied out with the characteristics of the materials to be handled in mind.

Two methods of conveying concrete which seem to have been very attractive to inventors are direct pumping and propulsion by compressed air. Knowing what has been done in hydraulic dredging in pumping mud and other mixtures of water and earth it would seem reasonable to assume that concrete might be similarly handled. We have, however, never heard of its being done successfully, while we do know of several attempts which have been absolute failures. Propulsion by compressed air has met with more success, experimentally at least. We are speaking, of course, of propulsion of concrete proper; as is well known, neat cement and mortar grouts are both handled successfully by compressed air, and grout pumps or grouting machines are familiar manufactured articles.

The most notable experiments with compressed air propulsion of concrete that have come to notice, were those made a year or two ago by Messrs. G. W. Buzzell and W. H. Larkin. After several trials these gentlemen devised an iron tank having a door at the top for charging the tank with concrete, and which could afterward be closed air tight, and at the conical bottom a discharge pipe connection. In the side of the tank there was a connection for the compressed air pipe. It will be seen that this is substantially the construction of the ordinary grouting machine; the tank was charged with concrete and sealed, after which the air and discharge valves were opened and the batch forced out through the piping. A 4-inch discharge pipe was used and concrete was delivered through 400 feet of piping, having several 90 degree bends, and one 180 degree bend on a 4-foot radius. It was also delivered to a height of 100 feet above the mixer. A 1:3:5 concrete of 2-inch stone mixed wet was employed, and of various air pressures tried 50 pounds per square inch was found most efficient.

The crucial tests of any or all of these methods of conveying are their effect on the quality of the mixture and their cost. There seems to be no reason to fear that any of the methods mentioned except pumping cannot, with proper care, be made to deliver a mixture in good condition. As to cost of conveying, they all show very attractive figures. Practically, however, the gravity chuting system is the only method that has been widely employed in actual work. From the records available this can, we believe, be considered a successful method from all points of view within the limits of its working range. It is not our purpose to make comparisons, however, as the data are not available for true comparison, but merely to point out that ways lie open for other than the common methods of handling mixed concrete, and that they offer possible means of economy.

Note and Comment

The Winnipeg Board of Control has issued special instructions that contractors doing work for the city must observe the provisions of the fair wage clause. In future, copies of pay rolls must be submitted at regular intervals to the city authorities.

Applications closed recently for the position of mayor of Magdeburg. The salary was 21,000 marks ($5,250) a year, including the rental of a dwelling in the city hall. The German idea of making the mayoral office competitive and of filling it with one possessing knowledge and skill of a technical and professional character is one that commends itself in many ways.

The Michigan Central Railway's tunnel under the Detroit river, the construction of which was described in our last issue, was subjected to further test last week by means of running electric Mogul engines with trains of coal through the tunnel, the loads being gradually increased until a full train had gone through at the regular rate of speed. It is expected that pasenger trains will be using the big twin tubes by the end of the present week.

It is instructive to note that a line of railway extension under way in the Northwest has had construction suspended—not because of the crop damage or because of adverse legislation, past, present or threatened, but because farmers had employed so many of the workmen for harvest work that it was not possible to make any progress in the work with the decimated crew remaining. It is apparent that there has been something of a crop remaining, to call for a wholesale raid upon railroad graders.

It appears that the city of Montreal will have to pay about $12,000 for "an error in sewer construction made by an engineer in Notre Dame de Grace Ward." It setms from the explanation given that after the annexation of the above suburb it was seen that it would not be possible to complete the sewer as originally contemplated, the designer having provided for the water to flow uphill. Another bill which the city will have to discharge is one for $2,213, expenses of *ex-officials* for trips made by them to the Legislature to prevent the annexation of Notre Dame de Grace. Montreal ratepayers certainly appear to be in a hard case.

A special rammer was recently devised in order to avoid making different kinds of concrete simultaneously for the floors and thus avoid also the danger of lamination incurred when the floor surface, in the first case, is made with special concrete on the wet body mass, or when, in the second, it is finished after the body has set. The flat surface of this rammer is deeply scored by longitudinal and transverse grooves making a series of small projections very much resembling those of an old fashioned meat pounder. Tht projections force the stones below the surface and flush up the mortar so that after being well rammed it is easily worked by trowels and floats to give a dense smooth surface integral with the body of the concrete.

Power Development at Hound Chute Falls

Description of the Cobalt Power Company's Hydro-Electric Plant—Constructional Details of Interest to Engineers and Contractors

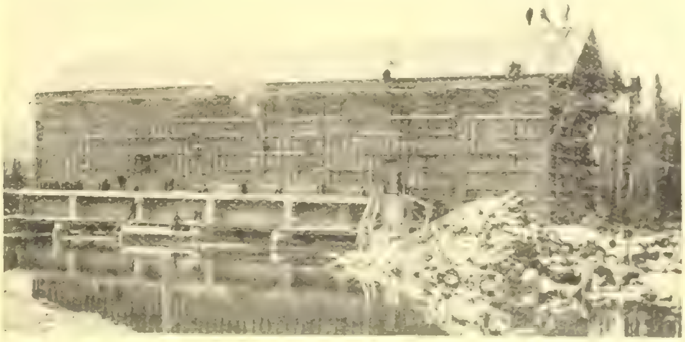
The record of construction on the Cobalt Power Company's hydro-electric plant at Hound Chute Falls, on the Montreal river, presents many features of interest to engineers and contractors engaged in this class of work.

The Cobalt Power Company was incorporated in December, 1906, with a capital of $500,000, to develop power at the above named falls, on the Montreal river, approximately six miles south of Cobalt. The necessary surveys and the preparation of plans occupied a portion of 1906 and the whole of 1907. The actual construction was not commenced until the fall of 1908.

Hound Chute Falls, Montreal River

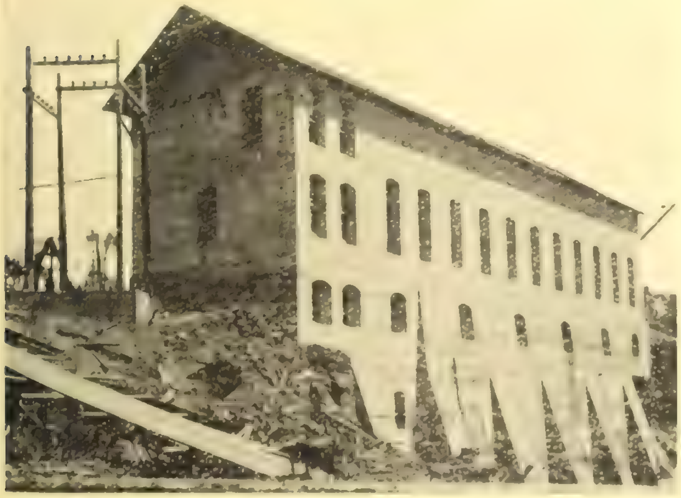
In order to locate a proper foundation for a dam, it was necessary to take soundings in the river above the falls and also in the old river bed to ascertain its depth. The lumbering operations on the Montreal river also had to be taken into account. After a careful consideration of these and other local conditions, it was decided to construct a timber dam at the narrows, above the Hound Chute Falls, of sufficient height to raise the water level 15 feet; to cut a head race following the old river bed for a flow of 2,000 c.f.s., corresponding to a maximum capacity of the plant of 5,700 horse power at the turbine shafts, under a head of 33.4 feet. The location of the power house was on the river bank, about 1,400 feet below the head race intake.

The dam referred to above is a rock filled timber dam, 34 feet wide, 200 feet long and 27 feet high in the centre. In the river bed and on the north bank, hard rock foundation was found. The east side extends 60 feet into a clay and gravel bank. The construction of the cribs was effected in the usual manner by building them at various points along the river bank, floating them into place and sinking by means of rock, hauled to the site from the canal and power house work. While the construction of this dam was carried out with great care, it is intended only as a temporary crib work. A concrete spillway will be erected in the near future.

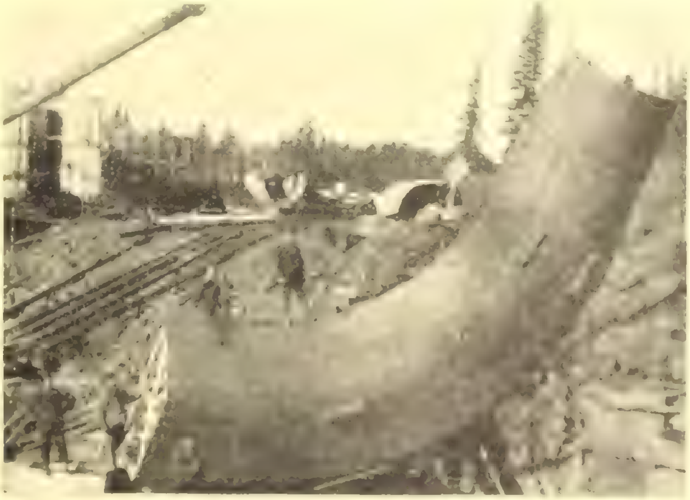


Power House under construction—intake side

Two stop log piers and concrete abutments were built at the intake for the head race. The piers are reinforced with steel rods and are anchored to rock. The tops of the piers and bottoms are 5 feet higher than the crest of the dam. The construction of this intake was completed first in order to afford protection against high water while the work was being carried on and also to facilitate repairs to the canal and power house. The

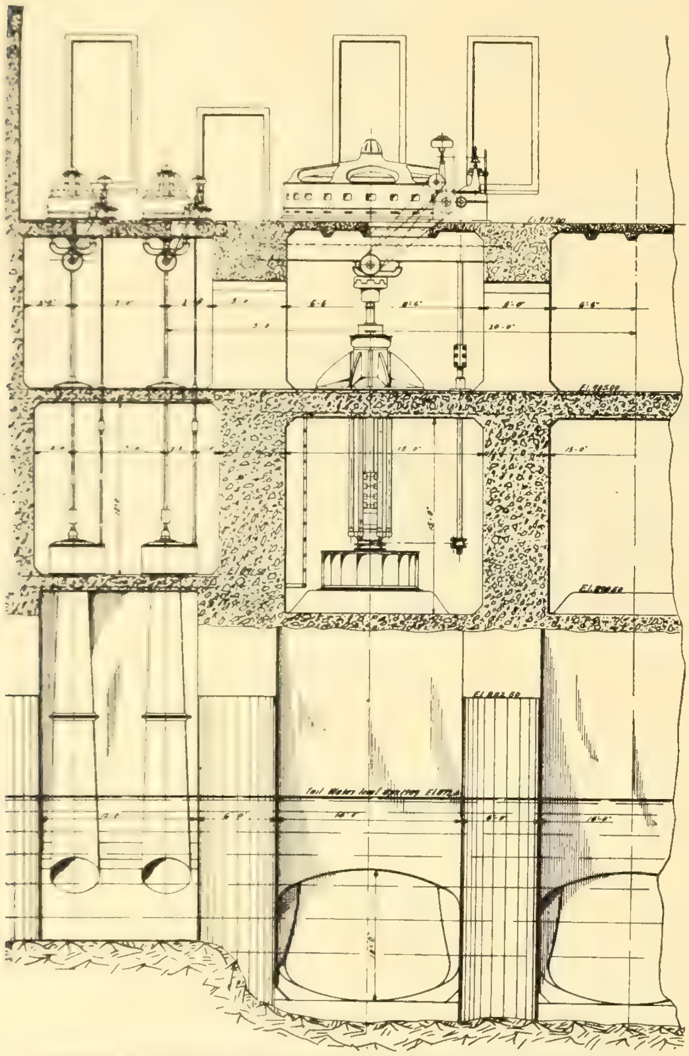


Power House of Cobalt Power Company—discharge side



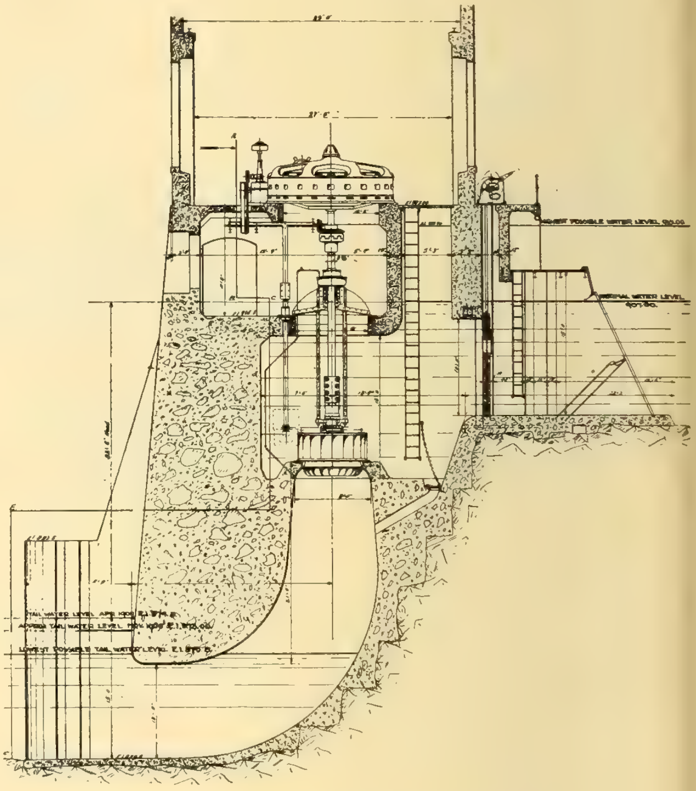
Framework for Constructing Concrete Draft Tubes piers and abutments are 16 feet apart. The area of the intake at normal water level is 67 square feet. A course rack will be put in between the piers and abutments. From the abutment core walls, rock filled cribs were built extending to rock bottom. The canal banks were protected with cribs wherever necessary. The west side of the canal being of rock, it was left in its natural state; the east side was rip-rapped 1:1. Little blasting had to be done as it was possible to follow the river bed a considerable distance.

The power house construction is illustrated herewith. The building is 130 feet long and 31 feet 6 inches wide. It is constructed of concrete, partly reinforced, and rests on solid rock.



Vertical Longitudinal Section of Power House Showing Generators, Turbines and Cement Draft Tubes.

Vertically the power house might be divided into the following four sections, making a total of 82 feet in height; the foundation with the draft tubes, the wheel chambers, the thrust and the generator decks. The thrust deck has not been built the full width of the power house, in order to get a clear opening of 5.25 x 15 feet from the generator floor direct into the wheel chamber through which any part of the turbine may be lifted up on to the generator deck by means of the crane, without removing either the thrust deck cover or the generator. At the intake of each turbine chamber there is a gate 10 feet high by 15 feet wide with by-pass and gate lifting apparatus as well as two stop log checks. This renders the turbines very much more accessible for inspection and repair, a factor just as essential in a hydro-electric plant as the accessibility of the dynamo. Provision is also made to take care of the leakage through the intake gate by a ditch and drain pipe with valve leading into the draft tube. At the head of each intake there is the usual rack with special platform. Canal and turbine intake are connected by a large fore-bay, the bottom of which has been arranged a foot deeper than the intake. Two under flow sluices large enough to take care of all the water at low water line have been built at the south end of the power house. The calculations for the stability of the building were made by assuming the highest possible water level at elevation 915.00, a wind pressure of 25 pounds per square foot and a snow pressure on the roof of 20 pounds per square foot. It was found that the maximum compression at the piers in the tail race is 132 pounds per square inch. Further it was found that under certain conditions the intake piers are subjected to tension; to take this up, they were anchored to the rock with two steel rods, 2 inches diameter, in each pier.


HIGHEST POSSIBLE WATER LEVEL
NORMAL WATER LEVEL
TAIL WATER LEVEL
LOWEST POSSIBLE TAIL WATER LEVEL

Vertical Cross Section of Power House

In the excavation for the fore bay and power house 7,600 cubic yards of rock were taken out. Six thousand cubic yards of concrete were required.

This plant, which has been in operation since April, 1910, was designed by Mr. A. Vonaesch, M.E., engineer for William Kennedy & Sons, Limited, Owen Sound. Mr. A. Gillies, B.A.Sc., was resident engineer.

The hydraulic machinery was furnished by William Kennedy & Sons, Limited, Owen Sound, and the electrical equipment by the General Electric Company, of Sweden, through Messrs. Kilmer, Pullen & Burnham, Toronto.

The Victoria, B.C., councillors did not approve of the recent action of the labor unions in urging them to give contracts to labor shops only, and so far as possible, to labor shops in the city. They thought this application an attempt on the part of the labor unions to run the council, consequently they went on record as favoring an open shop.

Materials in Use for Road Construction

Adequate Drainage Essential to Efficient and Economical Construction—Practical Directions as to the Application of Refined Tar — Its Various Advantages

By R. O. Wynne-Roberts, M. Inst. C. E. London, Eng.

The materials usually employed and the conditions to be fulfilled in the construction and maintenance of roads in large towns, differ considerably from those found on rural and suburban roads, for the financial resources at the disposal of the municipal authorities of large towns enable them to use materials which are quite beyond the means of rural and suburban road authorities. In view of the extraordinary growth of rapid transit locomotion and the difficulties created thereby, the following observations will be confined to roads of the latter category.

In the first place, the satisfactory construction and maintenance of roads on wet subsoil is admittedly difficult and expensive; efficiency and economy, therefore, require that adequate drainage should be provided, for which purpose stoneware or concrete pipes are suitable. The former should be thoroughly vitrified, strong and of good form, the latter should be made of high grade air slaked Portland cement and clean hard aggregate, in correct proportions and well mixed. Reticulating drains of strong agricultural pipes or stonework should be laid to remove water from all parts of the subsoil to the main conduits.

The foundation of the road constitutes the main strength of the structure and should be built of durable stone, hand-packed and well bedded. Inasmuch as the bulk of the traffic traverses the crown of the road the foundation should be stronger there than at the sides. If heavy traction engines use the road, the thickness of the foundations should be from 9 to 12 inches at the crown, and for a width of about 12 feet to 18 feet along the centre, thinning out to about seven inches at the sides; the thickness will, of course, depend largely on the nature, the composition and the weight bearing capacity of the subsoil, and the character and magnitude of the traffic which it has to sustain.

Application of Macadam

The surface material should consist of the most durable macadam obtainable, and in this connection it may be stated that there is ample room for standardizing, for at present there is no satisfactory method of correlating the value of different kinds of macadam. Attrition tests, etc., do not always conform with the results obtained in practice. The minimum thickness of macadam on the centre of the road should be about six inches and at the sides about four inches. The macadam should be spread in thin layers and rolled dry, the interstices being well filled with small graded stones, so as to reduce the voids as much as possible; a minimum of hard grit should be thrown on to bind the whole mass.

Taking into account the disintegrating effect of high speed traffic on the roads, it is necessary to employ a bituminous binder, such as coal tar, so as to keep the macadam together, to form a coherent and resilient surface, to prevent rain percolating into the fabric of the road and to reduce the quantity of dust produced by the traffic. Tar is one of the by-products of gas manufacture, but it is also produced in connection with coking ovens, blast furnaces, etc.; this communication, however, will in the main only deal with that produced from coal at gas works.

The writer having also had some experience as a gas engineer, is therefore acquainted with the methods of gas manufacture. The quality of the tar depends on the composition of the coals carbonized, the quantity distilled in each retort, the class of retort installed, the heat employed, methods of dehydration, etc. The constituent parts of the tar are differently grouped in each case, and it is therefore not surprising that the results obtained on road works differ so much under apparently similar circumstances. The space and time at the writer's disposal do not permit a description of the process of tar production, in detail; suffice it to state that water, light oils, and an excess of free carbon contained in crude tar have a deteriorating influence on the durability and effectiveness of its application on roads.

All crude tars retain a quantity of water in intimate admixture, and the latter increases, in most cases, in proportion as the temperature employed at the gas works is raised, and no extended period of rest will cause the same to be entirely eliminated. If, therefore, crude tar is used, it should be carefully boiled, which work entails some risk, as owing to the presence of water and free carbon, it is liable to froth over and cause trouble. When crude tar is used on roads, it is, owing to the emulsifying action of these light oils, liable to pollute the neighboring streams, but, given a period of dry, hot weather, the oils will volatilise on the road surface. Some engineers maintain that these oils are driven off by boiling in portable boilers, or kettles, but the writer submits that they are not material reduced in their proportions, except, possibly by prolonged firing, which is seldom done, owing to the loss of time and the expense.

Advantages of Refined Tar

Refined tar is superior for road works, as the water and light oils have been extracted by effective distillation. Its quality is more uniform and reliable. It will not foam over when boiled, nor will it tend to peel off dry stone surfaces if it is applied hot. It also adheres better and is more durable. If the naphthalene and anthracene, which are crystals possessing no binding properties, are also extracted and the dead oils returned to the still, the refined tar will be further improved. The tar distillers will have also extracted the most valuable and remunerative products, and thus permit the refined tar to be sold at a low rate.

The percentage of free carbon contained in the tar increases with higher temperatures of the retorts and in some modern gas works one-third of the pitch obtained by the distillation of tar consists of free carbon, which has no binding qualities necessary for road works. The specific gravity of crude tar is largely controlled by the proportion of free carbon it contains; that crude tar is thick and viscous, is therefore not a true indication of its value.

Before old road surfaces are tarred, they must be even and in good condition, and free from pot holes. The dust should be removed by energetic brushing, and the joints exposed as much as possible. The road should be

---

* Paper presented at Second International Road Congress, Brussels, Belgium.

dry and warm; damp surfaces prevent the tar from adhering firmly, and cold surfaces chill the tar and reduce its penetrative powers. The drier and warmer the surface, the more it will absorb liquids, capillary attraction being probably more pronounced, and the material is hungry and thirsty.

The tar can be distributed by hand or sprayed by machine. In the former process the temperature of the tar is, perhaps, under better control, and advantage can be taken of local climatic conditions, but it is slow, whilst the machine is able to cover a large area in a minimum of time. In either case, the tar should be given ample time to soak into the surface, to assist which and also to prevent ponding and streaming, squeegees or brushes should be energetically used. The traffic should be diverted, so that the newly tarred road is not disturbed, until a durable and plastic skin has been formed.

The use of grit, dust, or chippings does not seem warranted, especially immediately after the road has been tarred, for the tar should be allowed to sink into the surface rather than be retained on the top. The sand, grit or chippings, if used at all, should be evenly and frugally spread. Tarring of roads on wet subsoil and having no efficient under-drainage is almost useless.

Tarring of newly macadamized roads is preferable, as the joints are then more open, permitting the tar to get in between the stones and thereby to become a true binder, and if the voids have been reduced by a rational proportion of small stones, the coating and metal will become more solid and the durability of the work extended

The methods of testing the materials used on roads cannot be dealt with in a short communication, but it is nevertheless an important matter and merits a more general consideration and adoption.

The construction and maintenance of up-to-date roads require careful selection and scientific employment of suitable materials, and this desirable consummation can only be achieved by the aid of science and experience, hence the need for a fuller and more concentrated effort in this direction.

Municipal Ownership

As compared with a few years ago, little is seen in the public press of to-day concerning the matter of municipal ownership; but among municipal officials the subject is still an important one, and in individual cities it comes up from time to time as a subject of most absorbing interest. We are continually being reminded of this, says the "Municipal Journal," by receiving from time to time requests for information as to how many cities own and operate waterworks, electric light plants and other utilities, and our advice as to the desirability of such municipal ownership.

There is nothing mysterious about municipal ownership, nor should there be any difficulty in understanding when such ownership is or is not successful. The measure of such success should be in terms both of efficiency of service and of cost, the former being generally the more important. The conditions which will secure or militate against such success, however, are not so easy to understand or recognize. The too common mode of endeavoring to decide whether or not to adopt municipal ownership is to learn in how many cities it is practiced; which inquiry is too seldom supplemented by the additional one—how successful have these plants been? Seventy-four per cent. of the cities of over 30,000 population have municipal waterworks plants, according to the latest census report. Also, according to this report, less than ten per cent. of these have operated at a profit. Those who ask simply the first question would find the evidence greatly in favor of municipal ownership. Those who ask the second also would be greatly discourgaed against it if they should look no deeper than this mere statement, and make financial success the touchstone. We have always maintained that the books of a water department and its finances, including the arrangements with the other departments of the city, should be such as to show clearly whether or not the water department was operating at a profit. But in the majority of cases this is not done, and the city receives a great many benefits from the department which do not appear on the ledger. These may be in the form of public use of water for which no payment is made, low rates for private consumption, general fire protection, and possibly others, for which a private company would be paid and for which a municipal department should receive credit. Many reports of municipal plants would take on another complexion were this done.

Theoretically a municipal plant should give better service and at less cost than a private one. Better service, because the necessity of earning a dividend is not always present before the manager, and he can, for instance, lay extensions before they will be remunerative and in other ways seek the public benefit rather than the department's gain. On the financial side, the city can float bonds cheaper than a private company; should be able to obtain supplies somewhat more cheaply because being a larger purchaser, and would have certain other advantages. Practically, it is found that these advantages are largely offset if not greatly outweighed by disadvantages, the greatest of these being that of politics; others being "eight-hour" and "standard rate of wages" laws.

The incubus of politics may make itself felt either in the form of control of employees, or in a direct effort to use the plant for private gain regardless of effect upon the municipal property. No kind of public appliance can be operated successfully where the latter condition obtains; but where it is a matter only of favoritism in the employment of common labor, plants where no great amount of such labor is employed may not be fatally handicapped Waterworks afford one illustration of this, the expenditure for common labor in these forming a comparatively small portion of the entire expense. On the other hand, in such work as street cleaning, where practically all the expense takes the form of wages, the reverse is the case, and the cost is usually much higher than would be tolerated by a contractor or other private individual.

There are, of course, other considerations affecting the decision, such as the ability of the city to raise the funds necessary for constructing a plant, the risk involved in constructing and operating it, the latitude which state and municipal laws allow the city in conducting such business operations, etc. In general, we would say that if a city government is fairly free from the dominion of politics there would seem to be no good reason why it cannot engage successfully in any public service which is to a greater or less extent a public monopoly; but that the probability of success diminishes as the opportioning of the expense of operation increases on the side of common labor and decreases on that of the skilled artisan or scientific expert.

A building by-law is in course of preparation at New Westminster and will be submitted to the city council. The by-law will probably provide for the appointment of a building inspector. The Provincial Government has given permission for a re-survey of the entire city. In the latter connection the Board of Works will secure data and report at an early meeting of the city council.

New G. T. R. Hotel and Station at Ottawa

Building up the Federal Capital—Continued Article Detailing Progress and Methods of Construction—Interesting Features of the Various Contracts

The stone work of the new Chateau Laurier, the hotel being erected by the Grand Trunk at Ottawa, will be completed in September. The building was designed and superintended by Messrs. Ross & MacFarlane, architects, Montreal, and is situated on the southwest corner of Major Hill Park, with its south side and main entrance facing the two bridges which connect Rideau street with Sparks and Wellington streets, and is directly opposite the new Grand Trunk station which is nearing completion on the south side of the bridges. The gap between the two bridges is to be closed in forming a broad plaza between the two magnificent white limestone buildings. Views of the earlier part of the construction of the Chateau Laurier appeared and were described in the February 9th, 1910, issue of the "Contract Record." The building will be fourteen storeys high, including the two extra storeys of each of the five towers and the two basements. It is about 185 feet high from the level of the railway tracks shown in the accompanying illustrations to the top of the towers. Its entire circumference is 880 feet.

The hotel will contain 350 guest's rooms, of which 230 will be supplied with baths. The equipment will be most complete in all service features and in devices for the convenience of guests.

The building consists of two wings set at an angle of about 120 degrees to a central tower of circular shape. Each of the ends of the wings and the points of intersection is finished with a tower.

The exterior of the structure on all sides is of limestone, from Bedford, Indiana, above a granite base, which stops at the sills of the windows on the main floor. The cost of the stone used in the erection of this building will reach $250,000. All the stone comes already cut to Ottawa.

The long sloping roof is built of book tile supported on T irons, fastened to the structural part of the roof. The entire will be covered with copper.

The structure will be entirely fireproof. The floors are all reinforced concrete arches, finished in marble tile or cement. The only wooden floor is that of the ball room. The stairs are of cast iron. Three thousand tons of steel were used in the construction of the building.

The first illustration, taken on May 13th, is a view of the west side of the building, parallel to the tracks and also to the locks which connect Rideau canal with the Ottawa river. This side is 285 feet long. The picture shows the steel work completed except the roof and towers. The concrete arches or slabs of the flooring are cast up to the eighth storey. The lower two storeys of this side have an exterior of concrete which is shown for the most part completed. When the hotel is finished this concrete work will not be visible. A promenade will run along the entire length of the hotel, level with the second floor. It will extend over all the tracks shown in the picture. It will be of steel and concrete, supported on a wall of cut stone built along the west side of the tracks and corresponding with the granite work which forms the exterior of the first two storeys for the remainder of the building. In this view a start has been made in the granite work.

The second floor, level with the bridges, will be the main floor of the building. On this floor the office and rotunda will be situated.

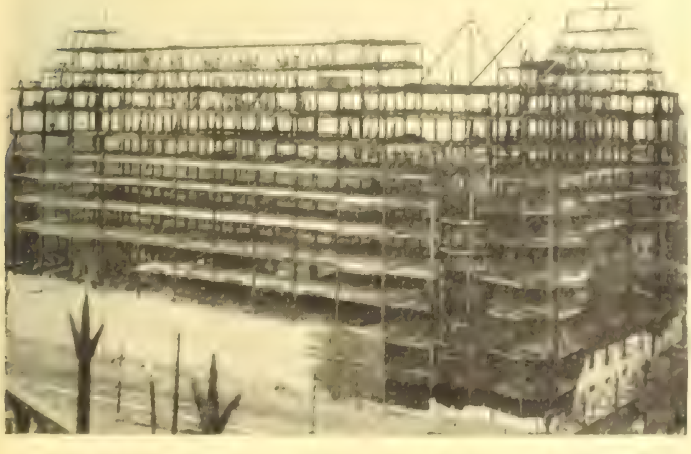
The second view, taken on July 1st, shows the stone work up to the fourth storey. The base of the bay window on the northwest tower is completed and that on the southwest tower is in course of construction.

At almost equal intervals around the steel work, derricks have been installed which facilitates prosecuting the stone work on all sides at the same time. The stone has to be hauled from the sidings on the other side of the bridges for this structure by wagons, as the tracks shown in the pictures belong to the C.P.R.

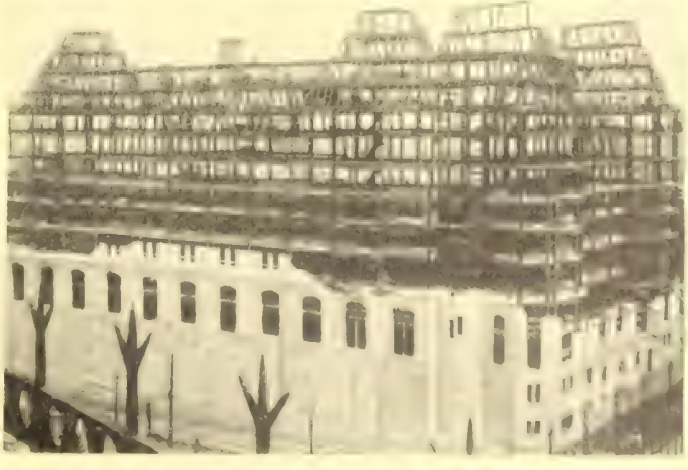
Illustration number three, taken on July 15th, shows the south side of the building and the main entrance. A loggia will extend from the main entrance of the hotel to the bridge. The stone work on the tower on the reader's right has reached the windows of the ball room. It will be noticed that stone balconies project from these windows. This side is 135 feet long. The picture gives an excellent idea of the beautiful location of the Chateau with the Parliament Buildings on the left.

The next photo (No. 4) is a sectional view of the roof, showing the complex nature of the steel work and the T irons in readiness for the roof tile.

Illustration No. 5, taken on August 26th, shows the



1 Chateau Laurier construction at Ottawa. May 13, 1910



2 Stone work up to 4th storey. July 1, 1910

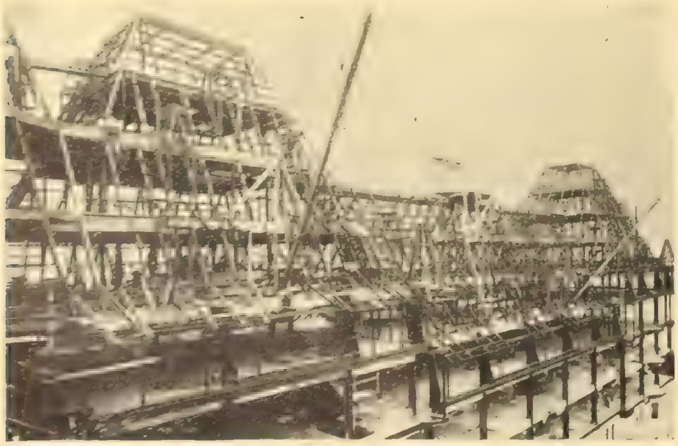
3—Progress view from south side. July 15, 1910

stone work of the south side nearly completed. The work shown in the foreground of this picture is the excavation for the pipe tunnel which starts from the power house in the rear of the station at the end of the baggage annex, and is carried under the passenger platform to the station, and from there under the basement of the station to the bridges, and through the excavation mentioned above to the Chateau. The tunnel is to conduct the electric wiring, steam pipes, water pipes, etc., from the power house to the station and hotel. There will be no boilers in the Chateau. A passage will also be constructed from the hotel, under the bridges, to the station for convenience of guests leaving or arriving on trains.

The last photograph of the Chateau work, taken Sept. 2nd, shows the stone work of the west side almost completed, including the bases of the turrets, which are architectural features of each tower, and the tops of the bay windows.

The work proceeded expeditiously all the summer, but in spite of this there has not been a serious accident to any of the employees since the excavation work first started.

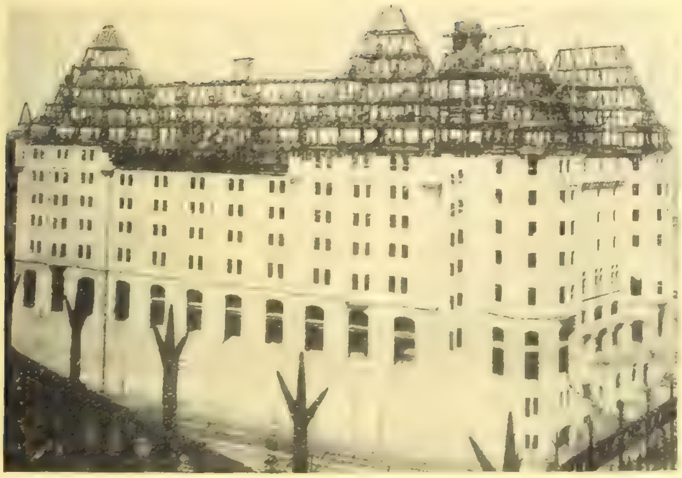
The George A. Fuller Company, of New York, have the general contract. E. F. Giberson & Company, of New York, are supplying the cut stone, and the C. E. Edwards Company, Ottawa, are doing the mill work. The reinforced concrete work has been entrusted to the Clinton Fireproofing Company, Limited, of Montreal, and the Dominion Bridge Company are supplying the steel. The Keystone Fireproofing Company, of New York, are supplying the fireproof partitions. McNulty Brothers, New York, are doing the metal furring and plastering. The Stanstead Granite Company, of Beebe, Que., furnished the granite and the Canada Foundry Company, of Toronto, the ornamental iron work. McFarlane & Douglas are doing the copper roofing. The plumbing will be installed by the Garth Company, Montreal.



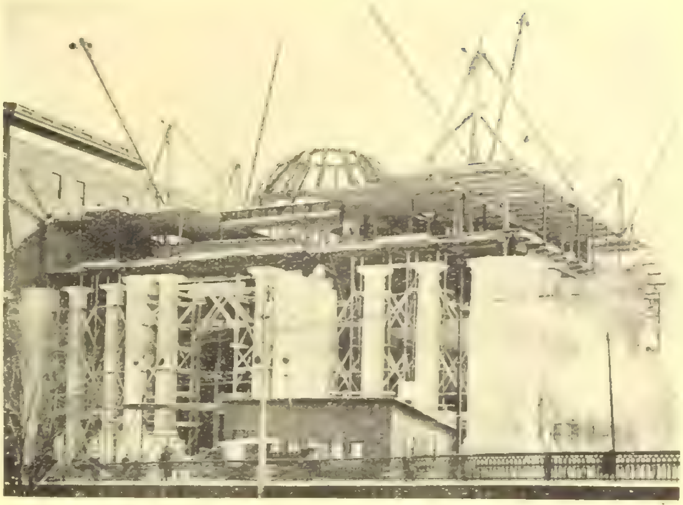
4—Section of roof, illustrating complex steel work

The interior work for this hotel is selected red birch generally, excepting the ground floor and ball room, which are in quarter-cut red oak. The inside winter sash are all in three pieces, of birch and oak to match the rooms, while the doors are of a splendid design with heavy double frame mouldings and one large panel, made in five-ply to prevent warping. The outside window frames are pine with Georgia pine pulleys, stiles and patent overhead pulleys. The trim is of a very neat design and will all be assembled at the works of the W. C. Edwards Company. The mitres will all be clamped with the Universal Appliance Company's patent clamp, ensuring a perfectly tight glue joint. This clamp is claimed to be the only perfect mitre clamp on the market. It is made by the Universal Appliance Company, of Ottawa. The outside sash are all clear white pine, of special design. All the interior work of this building, with the exception of the ground floor, is

5—Stone work on south side of Chateau Laurier nearing completion. Aug. 26, 1910



6—Stone work well advanced on west side of Chateau Laurier Sept. 2, 1910

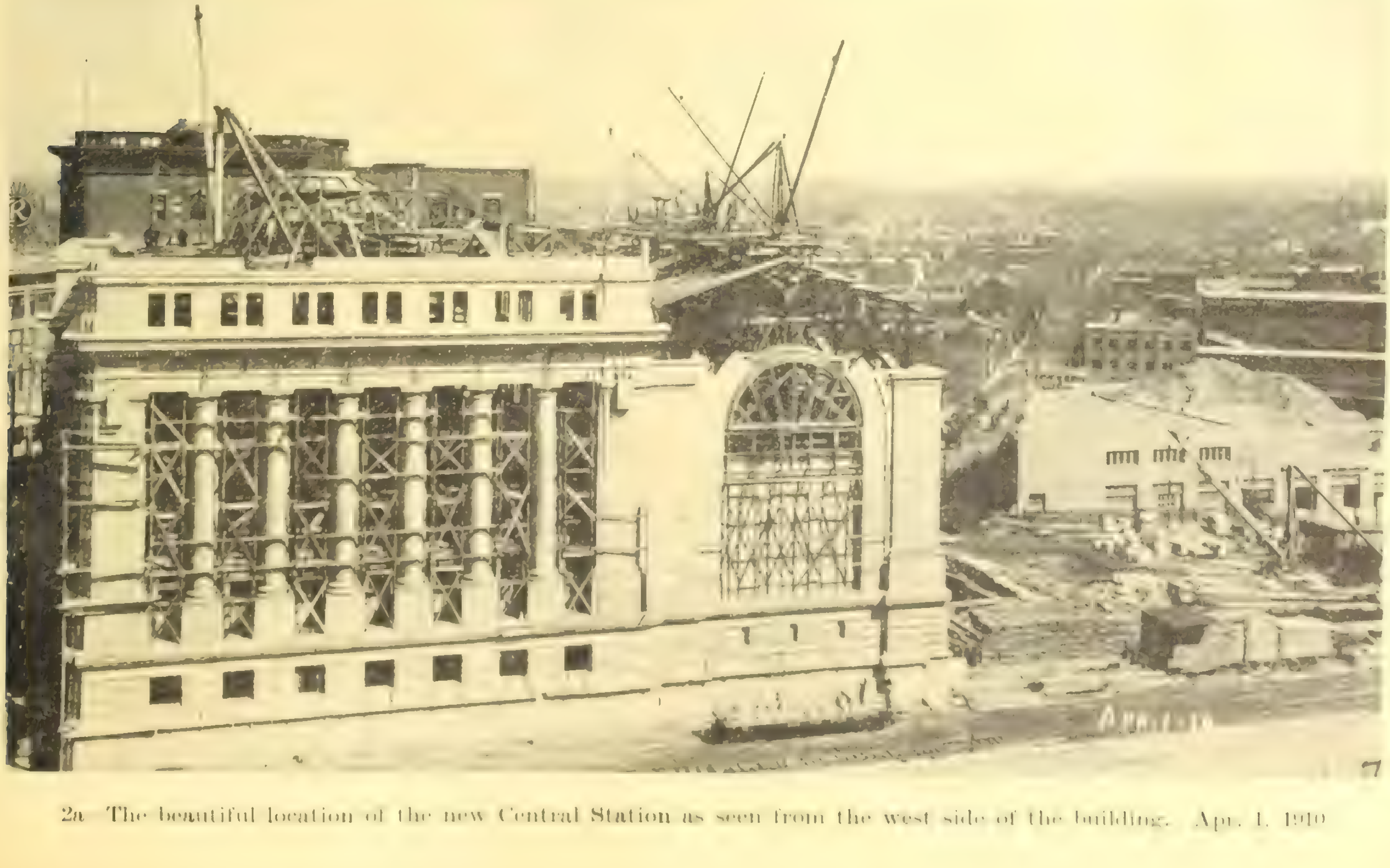


1a—Central Union Station, north side. Feb. 11, 1910.

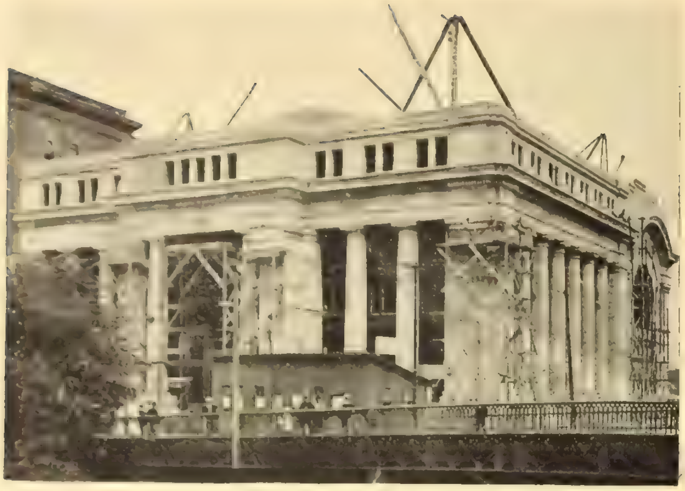
being supplied by the W. C. Edwards Company. The birch supplied on this contract is all cut from the company's own limits.

The total area of the reinforced concrete floors at the Chateau Laurier, for which the Clinton Fireproofing Company of Canada, Limited, Montreal, have the contract, amounted to slightly under a quarter of a million square feet. The floors were composed of cinder concrete, reinforced with metal fabric, the floor slab itself being 4 inches thick, which was carried on steel beams and girders. The whole of the structural steel beams and girders were fireproofed, so that at no point were they covered with less than 2 inches of concrete. In some cases the girders of a large span were three feet in depth. The rate of progress for putting in these floors was between 5,000 and 6,000 feet per day, until the floors which are in the roof were reached. Here the rate of progress was somewhat less, owing to the difficulty in setting the structural steel to keep ahead of the gang of carpenters putting in the forms for the concrete. The bulk of this contract was completed in practically two months, which is very expeditious work. Progress was facilitated by the steel work having been erected during the winter, when concreting would not have been advisable.

The ornamental iron construction throughout the building (Canada Foundry Company, Limited, Toronto, contractors), will be of the highest class, the principal stairs being executed in a fine design of wrought and cast iron. The elevator enclosures will be executed in bronze screens. The work generally will be of the same type and class of workmanship and design as has been adopted for the high class hotels in New York City.



2a—The beautiful location of the new Central Station as seen from the west side of the building. Apr. 1, 1910



3a—Constructional progres of new station. July 1, 1910. (Compare with 1a.)

When completed, the entire equipment will be a credit to Canadian designers and manufacturers of this class of material.

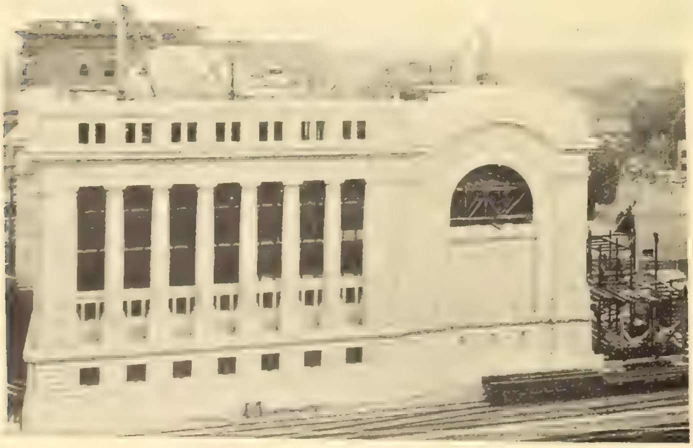
A descriptive article detailing the progress of work on the G.T.R. station at Ottawa will be published in an early issue.

Central Union Station, Ottawa

The exterior work of the new central station being erected in Ottawa by the Grand Trunk Railway is almost completed and the accompanying illustrations give an excellent idea of the beauties of this fine structure of classical architecture. The earlier part of the construction of this building was described in a former issue of the "Contract Record." Ross & MacFarlane, Montreal, are the architects, and Peter Lyall & Sons the general contractors.

Illustration 1A shows the north side of the building. The columns are all completed with capitals. The piers with the exception of one are finished. The columns are 40 feet high. The picture was taken on February 11th last, showing Sappers' bridge in the foreground. It shows the main entrance and the temporary roadway from the bridge over which much materials are taken to the upper storeys. The anchors for the marcque which is to cover the main entrance are shown in place in the piers and columns near the entrance.

Illustration 2A is on the west side. The beautiful entablature is completed and the top storey finished. The glass has been placed in the dome which supplies light for the upper storeys, which are to be used as offices. The stone used in this building and in the Chateau Laurier across the street, is the same. The baggage annex at the back of the station is shown completed.



4a—Commencement of steel work for wing extension. July 15, 1910

The third photograph, taken July 1st, is the north side with the scaffolding partially removed. The fourth, taken on July 15th, shows the beginning of the steel work for the extension of the wing at the rear part of the station.

In a later issue we hope to illustrate the final stages of the work and give further interesting details in connection therewith.

A Concrete Skew Arch

The old steel bridge across the Illinois & Michigan canal at Kedzie avenue, Chicago, was recently replaced by a reinforced concrete arch having an extreme length of 140 feet, and a width of 38 feet between railings. The roadway is 24 feet wide, including a double-track street railway, and there is a sidewalk on either side. The arch has a clear span of 75 feet, a rise of 15 feet, and is built on a skew of 68 degrees 30 minutes to the general direction of the canal. The following notes concerning it are taken from a paper in the "Armour Engineer" by Mr. John C. Penn:

Four spandrel walls were built directly on the arch-ring. The outer spandrels support the cornice, railing and the outer half of the sidewalk, and the intermediate spandrels carry the curb and the inner half of the sidewalk, besides acting as a retaining wall for the fill between the walls.

Twisted bars were used for reinforcement. In the arch-ring they were spaced 12 inches apart in both the top and bottom of the concrete, and the splices were alternated by varying the length of rods. Gravel concrete mixed 1 : 2 : 4 was used for the arch and spandrel walls, while the railing, cornice and ornaments were made of a 1 : 2 : 3 mixture with roofing gravel for the aggregate. Two-inch dressed and matched lumber was used for forms.

The arch-ring was concreted in three sections, each of which contained 113 cubic yards, and 25 men completed one section in a day. The concrete was put in rather wet and all outside surfaces were spaded. Drainage through the ring was provided for by wrought iron pipes. The upper surface of the ring and the inner sides of the spandrel walls were waterproofed with Sarco materials. Wherever spading was impossible, mortar was plastered on the inside of the forms before placing the concrete. The entire railing was built in place, and all horizontal surfaces were trovel-finished. The forms were very carefully removed and all rough spots were scoured with emery bricks.

Four expasion joints were built in each spandrel wall, one on each springing line and one at each quarter point. All rods except those in the upper hand-rail were cut at the joints. During the coldest weather last winter the joints over the springing line opened a full eighth of an inch, with no apparent ill effects. The falsework at the crown of the arch was built 1¼ inches too high to allow for settlement, and the crown is now within ¼-inch of its calculated position.

In the tunnel work for the trunk sewer at Toronto several fine samples of old trees have been discovered. These trees were excellently preserved although embedded in the clay upwards of 100,000 years.

Instructive Data for Municipal Engineers

Extracted from the Annual Report of City Engineer Rust of Toronto —Roadways and Sidewalks — Bridge Construction and Maintenance

The annual report of the city engineer of Toronto, Mr. C. H. Rust, issued last week, contains much interesting information in regard to the work of the department.

The area of the city is 28 square miles. Altogether, Toronto has 407.57 miles of streets, of which 262.13 miles are paved and 145.44 miles unpaved. There are 118.44 miles of asphalt pavements, 45 miles of macadam roadway, 25 miles of brick and 17.71 miles of cedar block pavement. There are 397½ miles of concrete sidewalk and 50 miles of wood, besides nearly 2 miles of stone flags and 3.66 miles of brick walks. The mileage of sewers is placed at 298½. The cost of the waterworks system to date is $7,000,000. The filtration plant at the Island will cost approximately $750,000.

The following extract from the report of Mr. A. Stewart, assistant engineer, relating to the construction of roadways and sidewalks, will be of interest:

Roadways and Sidewalks

Asphalt Pavements—During the year there were laid a total of 86 asphalt pavements of all classes—of these 86 pavements, 41 were of the light type and 7 were heavy.

As was forecast in last year's report, a new class of asphalt pavement, known as the medium type, was introduced, and 37 were laid. It is noticeable that while the number of these pavements laid is slightly under that of the light type, the yardage is largely in excess, and consequently the necessity of such a pavement is evident. The total yardage laid was 230,657 square yards, of which 49,139 square yards was of the heavy type having 2-inch asphalt surface, 1-inch binder course, and 6-inch concrete foundation; 69,179 square yards of light pavement composed of 2-inch asphalt surface, and 4-inch concrete base; 110,743 square yards of medium asphalt pavement, having 2-inch asphalt surface, 1-inch binder, and 5-inch concrete base.

In several cases where brick pavements have been down for a number of years, the residents preferring a less noisy pavement, have petitioned to have the bricks surfaced with asphalt. During the past year, the brick pavement was so treated, an asphalt surface consisting of 2 inches of asphalt, and 1 inch of binder being laid. This work was not necessitated by any disintegration of the original pavement, but was done expressly at the request of the property owners, who signified their willingness to pay for the asphalt surface. As the results have, as was expected, been good, it is probable that ratepayers, who live on other residence streets paved with brick, will take the same view of the matter, and have an asphalt surface laid.

The above yardage represents a total mileage of 15.111 miles, as against 21.031 miles laid during 1908.

Asphalt Block Pavement—There were constructed during the year, 11 asphalt block pavements, having a total yardage of 34,018 square yards, which is a large increase over the 9,469 square yards laid in 1908. Of the 11 pavements laid, 10 were composed of 3-inch blocks on 4-inch concrete base, and the remaining one was of 4-inch blocks on 6-inch concrete base. The above yardage represents a mileage of 2.334 miles.

The growth of this pavement is due solely to the activity of the agents of the company manufacturing the blocks, who circulate petitions among the property owners, and in the event of these petitions being sufficiently signed, it is recommended to council that the pavement be laid.

Below is found a table, brought to date, showing a comparison between the maximum, minimum and average prices for asphalt pavements, from 1901 to 1909.

		Maximum.	Minimum.	Average.
1901	Heavy	$2.70	$2.30	$2.54 6/10
"	Light	2.23	1.88	2.04 1/2
1902	Heavy	2.60	2.45	2.54
"	Light	2.15	1.66	2.01 1/4
1903	Heavy	2.50	2.14	2.21 3/5
"	Light	1.88	1.60	1.70
1904	Heavy	2.30	2.15	2.22 6/10
"	Light	1.83	1.53	1.65
1905	Heavy	2.19	1.99	2.05
"	Light	1.66	1.36	1.51
1906	Heavy	2.01	1.79	1.91 4/5
"	Light	1.64	1.38	1.42 2/5
1907	Heavy	2.27	2.14	.219
"	Light	1.83	1.50	1.62
1908	Heavy	2.33	1.92	2.15 2/3
"	Light	1.96	1.33	1.51 2/5
1909	Heavy	1.95	1.59	1.72 2/3
"	Medium	1.80	1.40	1.60
"	Light	1.44	1.12	1.28

The extremely low prices shown for the past year were brought about rather by the keen competition existing among the contractors, than by a reduction in the actual cost of the pavement. As it is impossible for contractors to lay asphalt pavements at these prices and make a reasonable profit, it is not probable that the city will again obtain so durable a pavement at such a small cost.

Brick Pavements—During the year 9 brick pavements, and 10 vitrified block pavements were laid, aggregating 8,588 square yards, and 12,653 square yards respectively, or a total of 21,241 square yards. This is a decrease of 95.07 square yards from the amount laid last year, and is due to the prejudice in the minds of the public against the pavement on account of the noisiness and not to any lack of merit in the material.

The above yardage represents a total mileage of 1.611 miles, and the amount of concrete curbing laid in conjunction with this class of pavement was 12,188 lineal feet.

The quality of the blocks as determined by the standard abrasion test is indicated by the following ratio:

Canadian	(after 2,000 revols.),	21.7	p.c. loss in weight.
American	(after 1,000 revols.),	9.3	p.c. loss in weight.
Canadian	(after 1,000 revols.),	13.6	p.c. loss in weight.
American	(after 2,000 revols.),	14	p.c. loss in weight.

Track Allowance Construction and Reconstruction

During the past year eight new track allowances were constructed and eleven old ones reconstructed aggregating respectively 3.118 miles, and 7.070 miles.

All the new work consisted of a 12-inch concrete base with inset steel ties. This form of construction while giving good satisfaction is very noisy owing to the great rigidity of the foundation. It is the intention, during the coming season, to modify this, if possible, by the use of wooden ties or wooden blocks embedded in the concrete.

Bitulithic Pavement—A total of 33 bitulithic pavements were constructed during the past year, the yardage laid amounting to 73,775 square yards. The yardage represents mileage of 5001 miles and is very close to the amount laid during 1908.

It is proposed to lay a bitulithic surface on an old macadam roadway after the surface has been properly graded. If this pavement proves a success, it is possible that more of this class of work will be done. As far as can be seen at the present time, there is no reason why such a pavement should not give as good satisfaction as the earlier bitulithics, particularly as the macadam, which will furnish the foundation, has been thoroughly compacted by years of passing travel.

Macadam Roadways—The macadam roadway construction carried out this year shows a decrease from last year's work; only 2 roadways totalling 1,170 square yards, or .086 miles, were laid.

The shrinkage in the amount of this class of work is to be noted with satisfaction, as macadam, while being the most suitable type under certain conditions, is not desirable for city streets, owing to the dust and mud which it creates.

456 lineal feet of concrete curbing were laid in conjunction with macadam roadways, during 1909.

Standard Specifications for Bridges

More bridge work was carried out during the year than ever before in a similar period of the city's history. This department is in charge of Mr. R. E. Chadwick. During the year complete standard specifications for bridges have been prepared. While these will necessarily have to be revised from time to time, they will ensure a uniform system of loading and a uniform standard of workmanship for all city bridges. The specifications classify bridges according to loading as follows:

Class A.—Highway bridges with electric railway tracks.
Class B.—Highway bridges without electric railway tracks.
Class C.—Electric railway bridges.
Class D.—Foot bridges.

The loading finally adopted after considerable study of the class of traffic to be carried, and after consultation with the various standard bridge specifications, was briefly as follows:

For electric railway tracks, 40-ton cars with an allowance for impact on the floor system equal to the difference between the live and dead loads for members carrying single track, or one-half this amount for members carrying double tracks. On main trusses this is reduced to a uniform load varying from 2,250 to 1,400 pounds per lineal foot according to the span. For other parts of the structure, a 20-ton road roller for the floor system, with uniform loads for trusses varying from 135 to 80 pounds per square foot according to span. Foot bridges and sidewalks are figured for live loads varying from 100 to 40 pounds per square foot.

The loading specified, with the exception of street railway tracks, is about equivalent to Cooper's Class A1 and A2, or the Dominion Government Class 1 for highway bridges. Considering impact, the loading on street railway tracks would give about the same sections as Cooper's specifications, but would exceed the Dominion Government specifications by the amount of the impact. Actual tests carried out on the Dundas street bridge show that bridges carrying this class of traffic are subjected to considerably more impact than is generally supposed. In the case of badly maintained track, the impact on the floor members was shown to be as high as 100 per cent. of the live load for speeds of 15 miles per hour.

As regards unit stresses and details of construction, the city specifications are equal to the best practice prevailing in highway bridge construction, and are inferior to the most modern railway bridge specifications only in a few minor details. The unit stresses in timber, while higher than those usually specified, are in accordance with the latest recommendations of the American Railway Engineering and Maintenance of Way Association.

Lansdowne Avenue Subway—The new subway on Lansdowne avenue, under the tracks of the Grand Trunk Railway and the Canadian Pacific Railway, has a total length of 900 feet, including the approaches. Eight tracks are carried across the street on through plate girder bridges, four of these being Canadian Pacific and four Grand Trunk. All the bridges are of the through plate girder type, those of the C.P.R. having a solid steel floor of 7/16-inch plate carried on transverse 18-inch 55-pound I-beams spaced 18-inch centres. The Grand Trunk bridges have wooden ties covered with 3-inch plank. These bridges were figured and designed in accordance with the C.P.R. specifications and Cooper's specifications, respectively. The retaining walls are of monolithic concrete construction resting on fine sand.

The total cost of the subway (exclusive of property damages), was $119,778.98, as follows:

Excavation and substructure	$49,115.54
Steel	54,517.71
Shoring tracks and maintaining traffic, sewers, pavements	14,942.15
Sundries	1,203.58

The Godson Contracting Company, Toronto, were the contractors for the substructure, and the Cleveland Bridge & Engineering Company, of Darlington, Eng., for the superstructure.

Harbord street bridge—A reinforced concrete arch has been built on the extension of Harbord street crossing over Beatrice street. It has a clear span of 34 feet 6 inches, and a clear height of 23 feet over the proposed grade of Beatrice street. The width is 54 feet clear between the parapet railings. The arch is full centered, 15 inches thick at the crown, and is reinforced with ¾-inch round rods spaced 12 inches centres. The retaining walls are 24 inches thick, heavily reinforced with square twisted rods and braced as counterforts at 9-foot centres.

An extremely satisfactory foundation was secured which considerably reduced the cost of the work, so that it will be completed well below the contract price. Borings taken at the site showed about 4 feet of brown clay and 10 to 20 feet of hard blue clay. Under this is a stratum of fine sand. The original plans provided for piles under both footings of the arch, but these were found to be unnecessary, except at the south corner of the east abutment, where an old well excavation was encountered. A total of $1,368.02 was saved on this account.

The General Contracting Company, Limited, of Toronto, were the contractors for this work, the contract price being $14,440.

Maintenance and Inspection of Bridges

Considerable attention has been paid during the past year to the cleaning and painting of the steel bridges. A number show serious corrosion, those crossing over railway tracks especially. Excessive corrosion is also evident on all the bridges crossing over the River Don, possibly on account of the gases from the large quantity of sewage carried by the river. A notable example of this is the Queen street bridge in which some of the lower chord angles have lost 50 per cent. of their cross sectional area in ten years.

In all, five steel bridges were cleaned and painted during the year, viz.: Eastern avenue, Gerrard street, Hallam's bridge, Lakeshore Road bridge and Huntley street. The railing only on the North Glen Road bridge was painted. Two wooden bridges were painted, viz.: Crawford street and Winchester street.

Sherwin-Williams' metalastic black paint (graphite) was used on most of the work. Hallam's bridge was painted with Canada Paint Company's grey graphite. Both of these paints paints have good covering capacity, and were satisfactory in all respects.

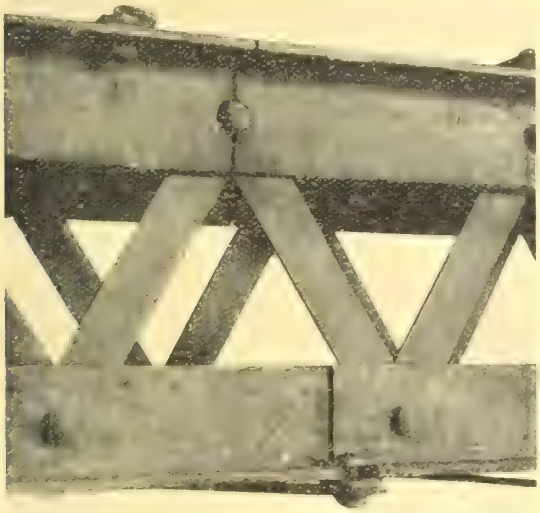
"Carbonizing coating," manufactured by the Goheen Manufacturing Company, Canton, Ohio, was used on the Eastern avenue bridge with excellent results. The paint has good covering capacity and lasting qualities if applied in warm weather. This is, however, offset somewhat by the high price.

Canada Paint Company's "G.T.P. Magnetic" paint was used on North Glen Road bridge, but is not satisfactory for a finishing coat as the surface is rough.

"Elaterite," manufactured by the Elaterite Paint & Manufacturing Company of Des Moines, Iowa, was used on the west approach spans of the Gerrard street bridge. The resulting finish is good, but the paint lacks covering capacity, and on account of its sticky nature is very expensive to apply.

With the constantly increasing cost of lumber, I would recommend that concrete be used for flooring on all new bridges that are built. Taking the figures for the past ten years, the top wearing course on the wooden bridge floors (2-inch red pine) has a life of 2.58 years, and in all cases fails by wearing through. The lower course of planking (3-inch red pine), and the joists fail by rotting after an average life of 8.5 years. Based on these figures the annual cost of maintenance of bridge floors would be 5.60 cents per square foot, equivalent to a depreciation of 17.78 per cent., all figures being based on present prices of labor and material.

On September 25th a serious break was discovered in the Queen street bridge, the lower chord at the west end of the south truss being found broken through. Fortunately the bridge did not collapse, probably on account of the stiffness of the upper chord and end post connection, aided by the arching effect of the whole chord and the connections of the buckled plate floor.



Broken Chord, Queen Street Bridge, Toronto.

The broken chord was of box section, composed of four 5-inch x 3½-inch x ½-inch angles latticed, all of which broke through the rivet holes of the lattice bars.

The bridge was jacked up at the first two panels from a temporary crib built in the river, and a new chord was built and riveted in place. This work was done jointly by the Canada Foundry Company, Limited, and our own men in the remarkably short time of 46 hours from the time the work was commenced until the bridge was opened for traffic, jacked up at the two panel points with the new chord bolted in place.

The fracture was probably caused by temperature stresses, since the rollers were badly rusted, and it would require a considerable force to move them. From the dead load, the chord would have a tensile stress of 150,000 pounds in all, or 9,375 pounds per square inch. Figuring the live load at 75 pounds per square foot, the stress from this would be 4,690 pounds per square inch. This would not be sufficient to rupture the member.

The Canadian Inspection Company made a very complete test of the broken chord. The tensile stress tests were good, being up to standard practice. The bending tests on flat pieces cut from the angles were satisfactory, but the angles themselves cracked after bending 40 degrees. Chemical analysis showed the material to be Bessemer steel with about 0.1 per cent. of both sulphur and phosphorus. There is no doubt that the high sulphur and phosphorus was the cause of any brittleness there may have been in the steel.

Main Drainage Works

A very complete report is submitted by Mr. A. C. D. Blanchard in connection with the work of the above department. Mr. Blanchard gives interesting details of the work carried out on the high level intercepting sewer described and illustrated in the December 15, 1909, issue of the "Contract Record." We hope to publish a further account of this construction at an early date. Excellent results have been secured by Mr. Blanchard in the bids received for work under contract, on account of extensive advertisement which is stated to have resulted in wide competition and a large saving to the city. Contracts have been awarded to competent contractors with excellent results as regards quality and progress.

Canadian Railroad Development

A meeting will be held in the near future to complete the financial reorganization of the Brockville & Westport Railway and the Marmora short lines, extending from the C.P.R., near Ivanhoe, to the iron mines. These two roads have been purchased by the Canadian Northern.

The Canadian Northern Railway has formally taken over the Bancroft & Irondale and Central Ontario Railway. The Irondale & Bancroft road is 50 miles long, and extends from Kinmount Junction to Bancroft, where the Central Ontario line runs from Picton to Maynooth, a distance of 132 miles. A stretch of 34 miles more, from Maynooth to Whitney, is now under construction.

As a result of the purchase of the Bay of Quinto Railway by the Canadian Northern Railway it is said that the construction of the Ottawa and of the Toronto-Ottawa line will be commenced at an early date. This will mean that the Canadian Northern line between Ottawa and Toronto will be completed several months earlier than was anticipated, and will be in operation not later than the fall of 1911.

Advices from Vancouver, B.C., state that another contract for the extension of the Kettle Valley Railway line from Rock Creek to Bull Creek on the west fork of the Kettle river, a distance of 35 miles, has been awarded to L. M. Rice & Company, of Vancouver and Seattle, Wash. Grading has already been completed from Midway west for 10 miles and construction work will be started within three weeks. The building of a 25-mile section of the same road from Merritt south through the Nicola Valley is now in progress. The company has authority to extend its line from a point south of Merritt across the Hope Mountains to Ruby Creek, below Hope. At Ruby Creek, after bridging the Fraser river, connection will be established with the Canadian Pacific Railway, whose tracks it already connects with the Midway and Merritt. The distance from Midway to Ruby Creek is about 271 miles. By means of its connections the Kettle Valley route will afford as direct a line between the coast and the Kootenays as the V. V. & E. Railway.

Sir Robert Perks, the British contractor, interested in the construction of the proposed dry docks at Levis and St. John, and the Georgian Bay canal project, arrived in Ottawa last Thursday, and interviewed the Minister of Public Works and other members of the Government, principally with reference to plans for dry docks. It is probable that nothing will be done for a year or so yet by the Government towards the construction of the Georgian Bay Canal.

Vancouver and Coast Correspondence

Latest Returns Show Unabated Activity in Trade—Stability of Supply Market a Feature of the Situation—Current News

Vancouver Office of "Contract Record."
September 14th, 1910.

Already over $200,000 ahead of the building permits total for last year, and with the greater part of four months yet to go, 1910 bids fair to surpass the records of other years by 50 per cent. The grand total for the first eight months of this year, as made up by the Building Inspector to Sept. 1st, amounted to $8,745,235, as against $7,270,645 for the full twelve months of the year previous. The total for the month of August was $745,235, which is considered a very good mark for a month not generally classed among the busy ones in the Building Inspector's office.

The city statistics for August indicate a healthy tone in all departments. Not in a single item has there been a falling off, the increases in bank clearings and land registry receipts, customs and other good barometers of material progress being all in the neighborhood of 50 per cent. or over.

The land registry office receipts for August were $15,024.51, showing a slight gain over July. The returns for August, 1909, were $11,037.65, showing that the real estate business has been active despite the tendency of many owners to refuse tempting offers in the expectation of getting double a year hence.

The general state of trade is best indicated by the bank clearings, last month showing an approximate increase of 50 per cent. over August, 1909, and being considerably more than double the figures for 1908. August, 1910, $36,533,143; August, 1909, $24,969,077; August, 1908, $15,483,153.

The customs receipts for August also constituted a record, being $20,000 ahead of June last, the best previous month, and about $200,000 in excess of the receipts for August, 1909.

Building Activity is Unabated

The leading city contractors unite in pronouncing this the businest season ever. All of them are crowded with orders, and strenuous efforts are being made to get the contracts in hand finished up or at least closed in before the coming of the fall rains. The influx of newcomers into the city has caused a tremendous demand for houses to rent, and this has been further aggravated by the return to the city of hundreds of families from summer homes and camping resorts. Many of these people rented their homes furnished for three or four months, and the occupants now have to seek new quarters. As an indication of the number of new citizens to be accommodated, we may state that the customs authorities have inspected the household effects of almost 5,000 Seattle and San Francisco people who have removed to Vancouver within the past eight months.

The scarcity of houses for rental is due to the fact that up to the present no large company has made a specialty of erecting homes. They have confined their energies to the more profitable department of real estate transactions. As a result 90 per cent. of the building has been carried on by small contractors who—being hampered for means—make it their aim to sell as soon as the roof is on, and generally succeed. Many newcomers, however, even if possessed of the necessary means, prefer to defer the purchase of a home until they have had time to get acquainted with the city. This accounts for much of the congestion.

In connection with the scarcity of homes, it is pleasing to note that at least one company has risen to the occasion and has mapped out an ambitious building programme. The Prudential Builders, Ltd., have purchased six blocks bounded by Thirteenth and Sixteenth avenue, Cypress street and the Lulu Island Railway, south of Shaughnessy Heights, in West Fairview, and will erect 75 residences, costing from $3,500 to $5,000 as soon as possible. The tract contains 105 lots, and the company have engaged a landscape engineer to lay out boulevards, and otherwise improve the property. The company will prosecute their building operations all winter. They aim to have fifty residences erected by the coming of spring.

Architects and contractors report that satisfactory progress has been made of late on all buildings in hand, there being an ample supply of materials and no shortage of men in any department.

Prices of Building Materials

(Delivered on Job)

Building paper, tarred, per roll, 90 cents.
Building paper, plain, per roll, 70 cents.
Bricks, common, per 1,000, $13.
Bricks, pressed, per 1,000, $40 to $62.
Cement (Vancouver), per barrel, $3.10.
Roofing felt, per 100 pounds, $2.45.
Fire brick (Scotch), per 1,000, $45.
Fire brick, small quantities, $48.
Lime, per barrel, $1.35.
Sewer pipe, per foot, 4-inch, 16c.; 6-inch, 33c.
Plaster of paris, per ton, $18.50.
Putty, per pound, 5 cents.
Tar, 4-gallon tin, $1.25; per barrel, $8.50.
Hard wall plaster, per ton, $17.50.
Nails, base, $3.25.
Nails, cut, $4.25.
Mixed paint, gallon, $2; ½-gallon, $1.10; quart, 60c.
Boiled linseed oil, gal., $1.40; barrel lots, per gal., $1.20.
White lead (genuine), 100 pounds, $8.
White lead, N. 1, per 100 pounds, $7.50.
Varnishes, furniture, 80c., $1; hard oil, $1.75; elastico-oak, $2; elastico-floor, $3.25.
Sash cord, per pound, 50 cents.
Sash weights, per 100 pounds, $2.50.
Tacoma hair fibre, per ton, $18 (including sacks).
Fire clay, per ton, $20.
Plate glass (35 per cent. off local tariff).
Sheet glass (10 per cent. off local tariff).
Expanded metal lath (Hays'), 27 cents per square yard; Herringbone lath, 17 cents per square yard.
Ready roofing (Cendor brand), ½ ply, $2.25; 1 ply, $2.65; 2 ply, $3.40; Malthoid, 1 ply, $2.50; 2 ply, $3.50; 3 ply, $4.50.
Hexagon floor tiling, average 60 cents per square foot.
Wall tiling, average 65 cents per square foot.
Turpentine, per case, $10.
Resin, per pound, 5 cents.
Elephant lead, per 100 pounds, $8.

Lack of Loyalty to Canadian Contractors

Much dissatisfaction prevails among architects and builders at the quantity of work that is being given to outsiders. Several of the large business premises in course of erection are in the hands of firms from the States, and the local men contend that, given the same consideration and facilities, the work could have been done here as well if not better. The methods adopted by Americans to get an order can hardly be followed here. Plans of buildings and photos of the premises in course of construction are submitted to intending investors, and statements made showing terrific speed in building, but it is never mentioned that all preparations were made months previously, and all material was on the job before the record piece of work was started. One case is instanced where a local firm lost $100,000 on a contract of this kind.

Imperial Steel Car Company's Important Plans

All eyes in the railroad and financial world to-day are centered on the developments in Vancouver of the Imperial Steel Car Company, which proposes to revolutionize the building of private and sleeping cars for the travelling public.

Among the improvements that the Imperial steel car will have over competitors are its ventilation, dust and fireproof, non-telescopic, and hotel equipment at each berth, all of which will be at the regulation of the passenger, without the interference of or hindrance to others. Baths will be at the disposal of travellers, and an ice receptacle and a steel safe under the seats of each section will serve to fill a long-felt want. While en route on the cars all the luxuries of a first class hotel or club can be indulged in without entailing any more cost than is at present in vogue on the transcontinental lines. Storage batteries will be placed in each car to maintain heat and light regardless of the connection of the engine. Numerous other factors in favor of the new car make the company look a healthy contender for the future building of rolling stock.

Will Establish Model Town

The company has acquired 800 acres, with two miles of waterfrontage, on the north arm of Burrard Inlet, about five miles from Vancouver postoffice. Here it is proposed to establish the town of Rosslyn, surrounding the big plant to be located on a 30-acre site on the waterfront. Two eminent engineers have been engaged to lay out the town in the most modern manner; the plan will be circular, every street ending at the centre or hub, while the streets will be wide and the lots large. The new million dollar high level steel bridge soon to be proceeded with will give easy communication with Vancouver.

In addition to their steel car industry it is the intention of the company to put in a plant and manufacture its own steel. They will also establish a mammoth dry dock to comply with Dominion Government conditions, so as to earn a bonus of 3½ per cent. on the $4,000,000 cost for 35 years.

Vancouver Aldermen Favor Automatic Phones

The business men of this progressive city are just at present at sixes and sevens over the action to be taken in respect of the following pertinent resolution, adopted at a recent meeting of the civic finance committee:

"In the opinion of this committee the present telephone service is unsatisfactory. We recommend that the British Columbia Telephone Company be given 30 days to decide as to the adoption of an automatic system. In the event of their failing to act in the matter, the city to take steps to allow a competing system to be installed."

The above ultimatum to the present company had its origin in the frequent complaints made by citizens as to the inefficiency of the present system, the decisive action having been hastened by a visit paid recently by the members of the committee to Bellingham, Wash., to inspect the automatic telephone system in use there, and by the application of New York capitalists for a franchise. Their representative, Mr. Woodworth, claimed that the service of the automatic system was far superior to the manual service and presented letters from numerous cities in support of this contention. It was argued also by other speakers that the charges for the present telephone service were exorbitant on account of the increasing rates as the distance from the central station increased, and the statement was made that the plan now under way of establishing sub-stations would lengthen the time occupied in replying to a call. For the new company Mr. Woodworth claimed lower rates, an up-to-date service and absolute privacy of communication. Where the two systems had been installed in the same city better service had been given by both concerns because of competition.

Since the passage of the resolution cited at the beginning of this article, various bodies of business men have met and drafted resolutions protesting against a dual service on the score of the increased cost. These will be considered at a meeting of council called to receive the recommendation of the finance committee.

News Notes of Interest

Victoria's building permits for the year are expected to exceed the two million mark for the first time on record. Things are healthy at the capital—politically and otherwise.

The Grand Trunk Pacific Railway Company has acquired over two acres of land on Government, Belleville and Elliott streets, Victoria, facing the Parliament Buildings, on which will be erected a first class hotel as part of the transcontinental system. The site cost $291,000.

Fort George is to have a court house, registry office, jail, and other public buildings.

While the tax rate of the city of Nelson for 1910 has been fixed at 45 mills, it is claimed that this is deceptive inasmuch as the assessment is low. If this be true, the Board of Trade should take prompt steps to bring about a change. It will do the city no good to be tagged up with such a rate in the eastern papers.

Work has been commenced on the foundations for the 18-storey home of the Vancouver "World," on the corner of Pender and Beatty streets. It will be one of the model newspaper buildings of the continent.

Mr. G. H. Bryson, formerly assistant city engineer of Victoria, who recently resigned, has entered the employ of the Worswick Paving Company of that city. Thos. Donavan, foreman on paving work for the city, has been appointed superintendent of all outside work, the aim of City Engineer Smith being to place local men in charge of the works wherever possible.

A recent amendment to the Victoria, B.C., building bylaw makes it compulsory that shingles on all buildings within the fire limits be laid in mortar or over asbestos paper.

Two hard working city officials, Building Inspector Jarrett and Chief Electrician McCrossan, are now comfortably located in larger quarters on the upper floor of the city hall. The business handled by these two departments is growing at a tremendous rate.

L. M. Rice & Company, contractors, of Vancouver and Seattle, have been awarded a contract to extend the Kettle Valley Railway line from Rock Creek to Bull Creek, on the west fork of Kettle river, a distance of 35 miles. Twenty-five miles of the same road from Merritt south through Nicola Valley is now in progress.

The Board of Park Commissioners for Vancouver has declared against the granting of a franchise to any company to construct a tram line around Stanley Park, believing it in the interest of the citizens of Vancouver to own and control all transportation in the park. The application and consequent discussion will, however, lead to the institution of some cheap mode of conveyance by auto bus or otherwise in the interest of working people.

Tenders will shortly be invited by the British Columbia Electric Railway Company for an addition to their main station on Westminster avenue and a new sub-station on 24th avenue, in Point Grey Municipality. The erection of the proposed new tram station at the corner of Hastings street and Carrall avenue, has been postponed until next year owing to the immense amount of work under way on various sections of the system.

The new cement plant at Princeton, B.C., is being rushed to completion, and the management hope to be able to supply the trade by the beginning of the year. The plant will cost $250,000, and the output will be 1,000 barrels per day.

Work has been commenced on the new wire nail factory to be erected on Lulu Island water frontage, about half a mile south of New Westminster, by G. W. Laidlaw, formerly of Campbelltown, Ont. Wire nails and fencing will be manufactured, and later on a galvanizing plant will be added. There is an excellent opening for the industry, the Vancouver factory being unable to supply the large and rapidly growing market in British Columbia.

The "Saturday Sunset," of Vancouver, sits down hard on the proposition of the Nelson Board of Trade that the Dominion Government should co-operate with the city of Portland to establish water communication between that city and West Robson in order that the Kootenay country may escape from the excessive freight rates imposed by the C.P.R. The "Sunset" points out that too much of the trade of British Columbia is already absorbed by our American friends owing to the railway lines pushed into the country by "Jim" Hill, the Great Northern Railway magnate. The opening up of the river route between West Robson and Portland would cost between $40,000,000 and $50,000,000, and it would probably be cheaper to compromise with the C.P.R. and secure a fair deal by paying a lump sum.

City Clerk Gough, of Nanaimo, claims to be the oldest municipal clerk in Canada, having occupied the position in various capacities for over 35 years.

North Vancouver is taking on city airs. The old volunteer fire brigade is to be dispensed with, a start having been made by appointing a paid chief and four paid firemen. New apparatus worth $10,000 has been ordered.

The members of the city councils of Vancouver, New Westminster, Burnaby, and other municipalities, were the guests of the Western Canada Power Company at Stave River Falls hydro-electric plant recently. The trip was made by special train to Ruskin, where automobiles were waiting to whisk them over the nine-mile route to the falls. The visitors were met and welcomed by Mr. Wm. McNeill, a director of the company, who piloted them about and explained everything lucidly.

The Fraser Valley Sugar Works, Limited, has been incorporated, with a capital of $300,000. The company will commence at once the erection of a large sugar beet plant at Mission City, the farmers of the district having signified their willingness to devote a large acreage to the growing of beets. It is believed that the enterprise is peculiarly adapted to the Fraser Valley, and that other plants will be established at various points.

The citizens of Victoria are wisely hesitating about undertaking the Sooke water supply scheme owing to the excessive cost of the necessary tunnelling. The alterantive proposition is to acquire the present Goldstream plant, which engineers declare can be made to supply sufficient water for a population of 300,000. The Goldstream Company claim that their revenue last year was $51,000, with expenses of $10,000, leaving a net profit of $40,000.

An indication of the tremendous development taking place in the suburban districts surrounding Vancouver is afforded in the fact that Point Grey municipality is about to expend $500,000 on a waterworks system, and $250,000 on a sewerage system, in addition to other large sums for a street railway service and electric lights.

The early construction of the great bridge to be thrown across Burrard Inlet at Second Narrows, in order to afford a better means of communication between Vancouver and North Vancouver, now seems assured. The amounts already in sight are: District of North Vancouver, $250,000; Provincial Government, $250,000; city of North Vancouver, $100,000; company's borrowing power, $750,000; a total of $1,350,000, exclusive of the substantial assistance expected from Vancouver, Burnaby and South Vancouver.

The British Columbia Electric Railway Company's workmen are busy removing all poles in the west end, and the Telephone Company has notified the city electrician of its intention to take similar action immediately.

Litigation at Portage la Prairie

A dispatch from Portage la Prairie, Man., contains the information that suit will be brought against the local parks board for an amount between $5,000 and $6,000, as a result of the holding back of estimates of the contractors for the dam, which were approved by the engineers, but later ordered held back. This amount is practically the total of the final estimate on the work, less about $500, which the contractors admit they are liable for. When the work on the dam was finished, the engineers inspected the work and approved of the final estimate, giving the contractors an order to that effect, but before it could be passed by the parks board there was a break in the dam and the engineers directed that the estimate be not paid, they claiming that the break was due to faulty construction. The contractors are Merriam & Symington. This action on the part of the contractors has been expected in certain quarters, as they have taken no steps to make the necessary repairs to the dam, which were ordered to be begun by the engineers on Sept. 1. The outcome of the action will be watched with interest.

Personal News and Notes

An address on "City Planning" was given at Halifax, N.S., on Sept. 19th before the Civic Improvement League, by Mr. Nolen, the landscape architect.

Mr. J. E. Cauchon, of the C.P.R. engineering staff, delivered an address last week before the Ottawa branch of the Canadian Society of Civil Engineers, on the Ottawa tunnel project.

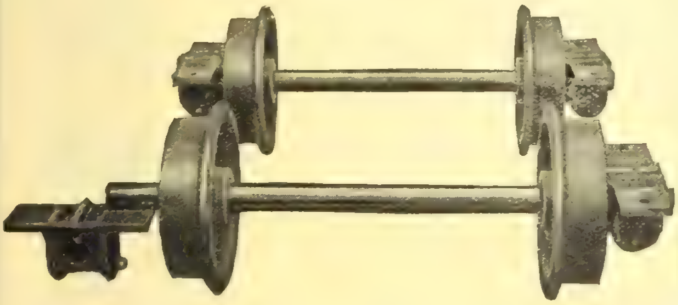
Mr. Frank Adams, who for the past two years has been assistant city engineer of Brantford, Ont., has resigned in order to accept a position with Mr. Willis Chipman, consultting engineer, Toronto.

The holdings of the Lineham-Scott Sand & Gravel Company have been purchased by the Worsnick Street Paving Company, the concern which located in the city some months ago and which has already carried out several good sized contracts. The purchase price is placed at about $250,000.

A lock-out has again gone into effect at Winnipeg, where the Bricklayers' and Stonemasons' Union refuse to yield the contested point as to the status of the Lyall-Mitchell firm. T. R. Preece, first vice-president of the International Bricklayers' & Masons' Union, was in the city last week and might have ordered the men back to work and so saved what may prove to be a long and costly dispute. He considered, however, as might be expected, that the union was justified in its action.

One of the most noteworthy features in connection with the equipment of the new Windsor street station at Montreal is the installation of eleven elevators. This contract, which is probably the largest of its kind ever awarded in Canada, has been given to the John McDougall Caledonia Iron Works Company, Limited, at a figure stated to be in the neighborhood of $100,000. The John McDougall Company have secured the exclusive use of the patents of Mr. T. Larsen, of Worcester, Mass., a well known expert who is now in Montreal in connection with the Windsor Hotel contract.

Build Your Own Cars Using Our Irons



Your cars will cost you less, and will be built just to your liking
We make a business of manufacturing car wheels, axles and boxes.
We employ expert, high-priced metallurgists to regulate the composition of iron in our wheels and get just the right chill.
We guarantee our car wheels to be strong, tough and well chilled, ensuring long service.
We make wheels any size, fit them to axles for any gauge track, and supply any style of box required.
Let us quote you.

Marsh & Henthorn, Limited
Makers of Hoisting Machinery Belleville, Ont.
Sales Agents: MUSSENS LIMITED, Montreal

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

Specify in the Contract

"Metallic"
Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

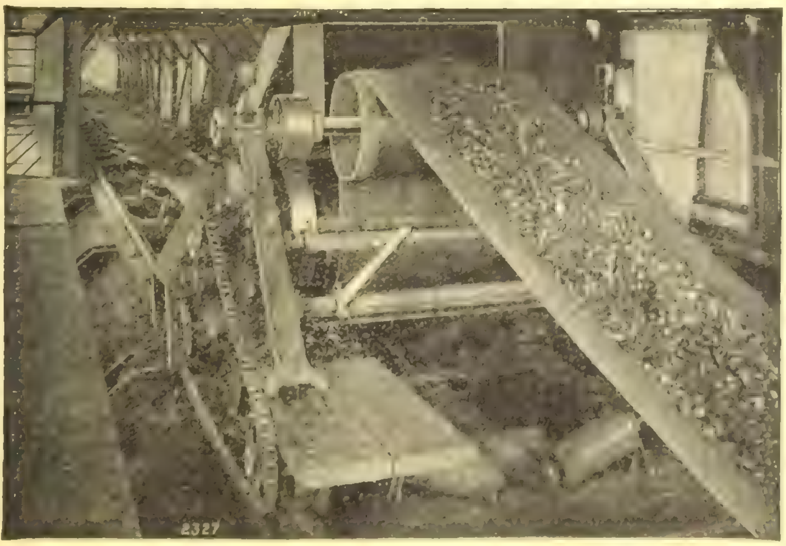
The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting
FOR TRANSMISSION AND CONVEYING



A 30" Extra Stout Scandinavia Belt in Operation Carrying Coal.

A Solid-woven, Impregnated Textile belt.

Equally good in wet and dry places.

Not made in plies and will not come apart.

Made in three weights and in widths up to 60 inches.

WE GUARANTEE that this belt on a basis of price will give you better service than any belt on the market.

Write for Bulletin "A" and Discounts to

Federal Engineering & Supplies Limited
284 Yonge St. - TORONTO

Canada's Largest Reinforced Concrete Building

[constructed] throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS—If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS—if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and Roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

Branches: Toronto, Montreal, Winnipeg, Vancouver

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

Sand and Gravel

We can supply you with Sand and Gravel
Screened, Pit Run and Pea Gravel

Building Sand

Let us quote you on your next job

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664 / 665 Evenings, North 2107 / 658

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

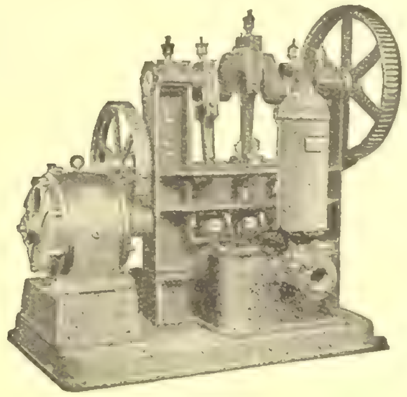
The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**

Phone Main 1054

Works: Seneca Falls, N.Y.

Save from 25% to 50% of Steel
by using the

"Burrowes" Patented System of Reinforcement for Concrete

A perfect reinforcement for beams, girders, slabs, arches, retaining walls, culverts, circular conduits, concrete poles for power and telegraph lines, and every kind of concrete construction.

We will supply reinforcement fabricated, or will lease or sell rights. For further information apply to

SIDNEY BURROWES, Niagara Falls Centre, Ont.

Canadian Patent No. 774376. Patented also in Great Britain and U. S. A.

White Integral Supports

for Furring Bars

Make the best and most economical ceilings.
Immediate delivery can be made. :: ::

Dominion Fireproofing Co.

EADIE-DOUGLAS, LTD., Sole Agents

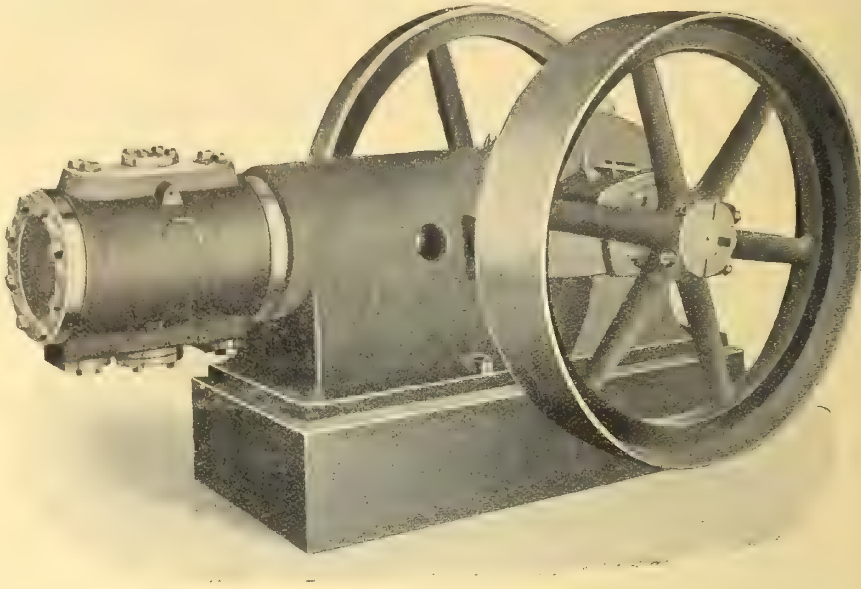
12 University St., MONTREAL, CANADA

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Offices:
Nos. 346 and 348 Broadway, NEW YORK CITY U.S A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont. London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N B.; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS C IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis,

(Taylor & Gordon)

Architects

North British & Mercantile Chambers,
80 St. Francois Xavier St., Montreal
Telephone Main 281.

Harry Allen Jacobs
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

You'll Never Regret It

This is the busy season for architects and contractors, preparing plans and specifications for Fall operations be sure you recommend

Port Credit Brick

It's the make that lasts the longest, looks the best

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phones: Office 1217
Yard 4507

Sand & Supplies, Ltd.
TORONTO

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

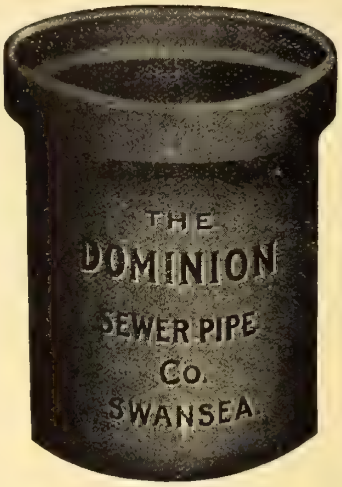
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

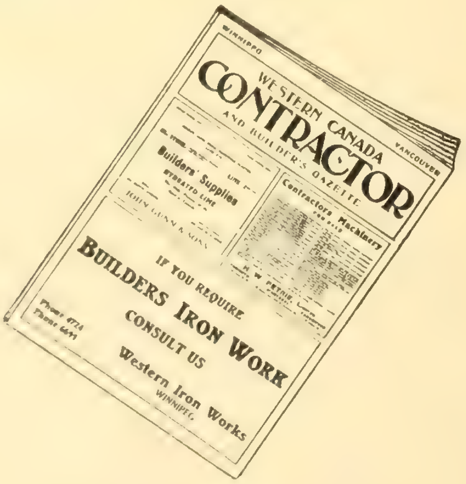
also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
Contractors Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe
Single and Double Strength. Sizes 3″ to 42″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

R. H. NEW,
Vice-President.

J. H. NEW,
President.

To do One Thing Best has been Our Desire for 50 Years, and To-day

we have our reward in knowing that

HAMILTON
Vitrified
Sewer Pipe

is known throughout Canada as the one line of SEWER PIPE that has proved to be absolutely reliable.

You can depend on our material, our loading and prompt delivery.

Prices always right. Let us show you.

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy

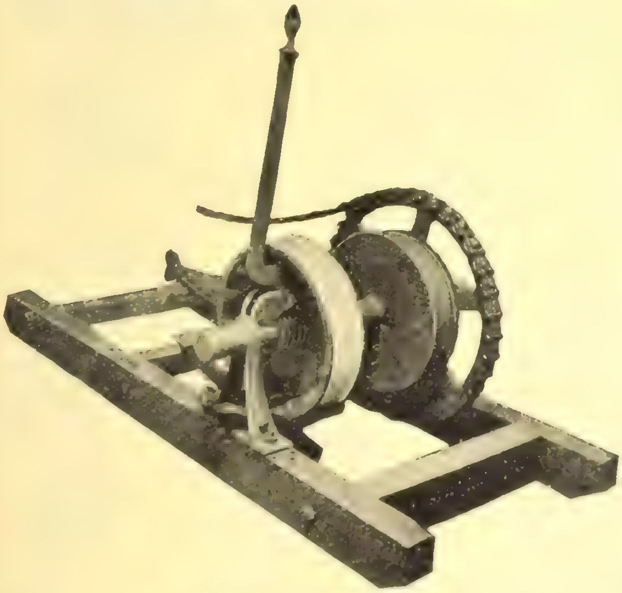
or any kind of

Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists
London, Canada

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

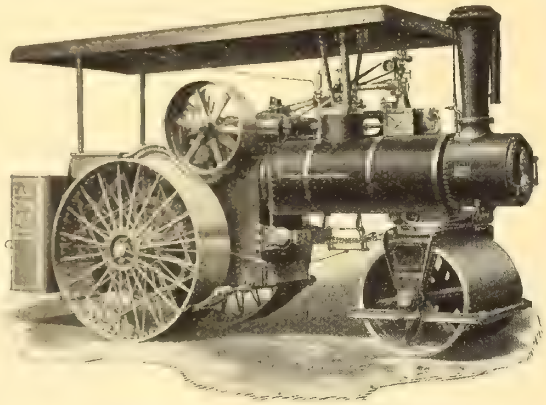
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

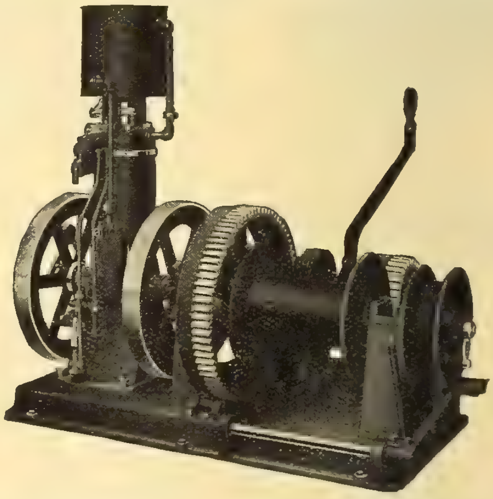
Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

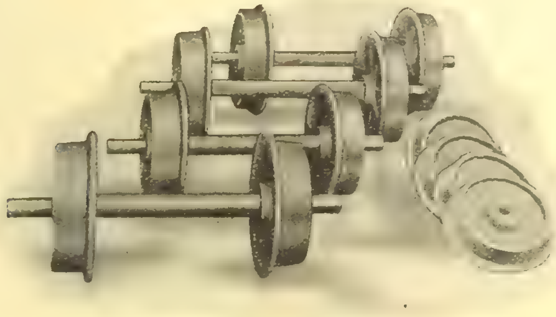
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Hamilton, Ont.
Three Rivers, Que. Midland, Ont. Londonderry, N.S.
St. Thomas, Ont. Fort William, Ont.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Cawthra Mulock, President - - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

---

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

The KATIE Foundry, Galt, Ont.

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING
and DRYING SYSTEMS

Canada Office, 72 King St., E. Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to colo., 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.
7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Gaudiose Barril, contractor, is stated to have assigned.

Lewis & Ross, contractors, Montreal, are stated to have dissolved.

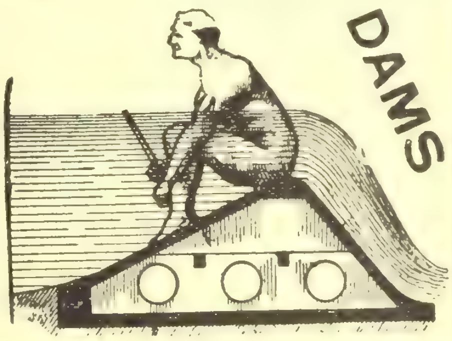
Grahame & Nye, painters, North Vancouver, are stated to have dissolved.

Desjardins & Villineuve, plasterers, of Montreal, are stated to have dissolved.

The Standard Cement Brick and Block Company, Montreal, are stated to have dissolved.

The Dominion Dry-dock Company has organized in Montreal, with Andrew Allan as president and Sir Hugh Allan, G. M. Bosworth, W. M. MacPherson and Capt. D. C. Newton as directors. Others interested in the company are Sir Thos. Shaughnessy, Sir Robt. Perks, W. M. Dobell and G. T. Davie. The company will build dry-docks at the leading points in Canada, the first one to be built at Levis.

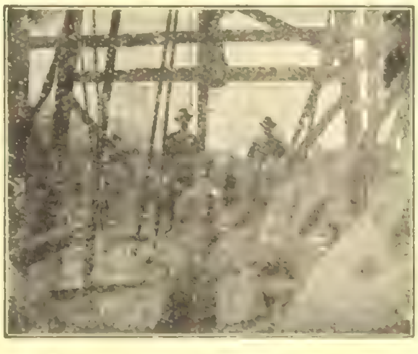
ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

Established 1882
THE COMMERCIAL
The Weekly Financial, Commercial & General Trade Newspaper of the Great West.
Winnipeg Manitoba

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD



Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished
References Given

New Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

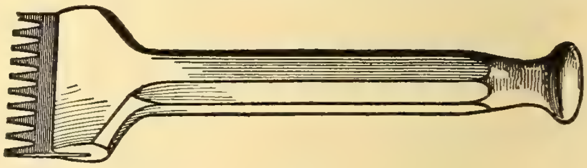
Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.



The
"Simplex" Stone and Marble Cutter

This tool is furnished with adjustable blades for both freestone and marble, the blades being replaced when worn. The new blades are cheaper than sharpening the solid tools and save a lot of trouble. They give perfect satisfaction.

We also supply double tooth cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"

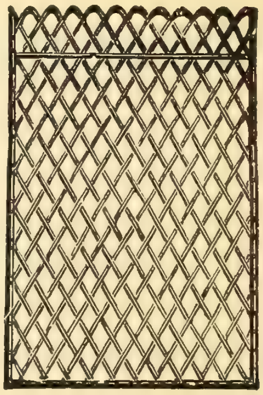
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

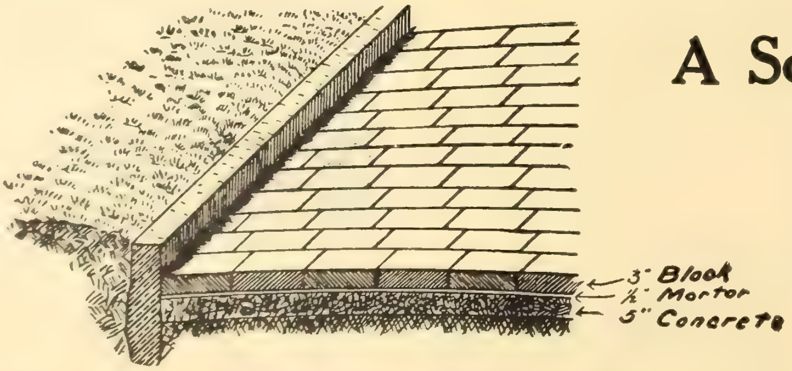
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

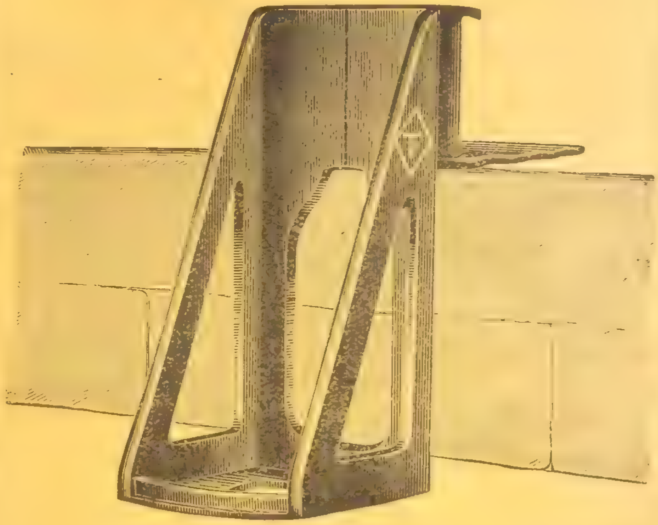
HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

These are Right

ELBOW

TEE

CROSS

IF THERE IS AN
S ON THEM **S**

We manufacture and stock a full line of Screwed and Flanged Cast Iron Fittings.

Send for a Catalog

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

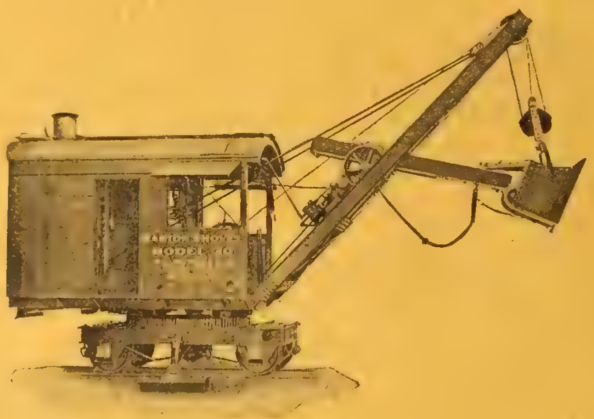
Georgian Bay Shook Mills
Limited
Midland, Ontario

"Marion"

Revolving

Steam Shovels

Especially designed for Excavations, Brick Yards and other light work or in cuttings where the material can be handled more economically by means of cars of about 1½ yard capacity, drawn by horses.



Manufactured in two sizes—¾ cubic yard and 1¼ cubic yard. These shovels are built along the lines in point of material, workmanship and design as the Marion large size Shovels.

Dump Cars. **Steel Rails of all Weights**

We can submit you a proposition on plant of any description. Write us.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **E. A. Earle & Co., Vancouver**

Vol. 24 Toronto, September 28, 1910 No. 39

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE

The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

"Queen's Head"
CANADA

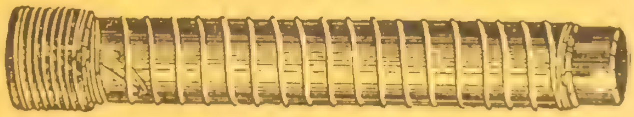
Galvanized Iron

When you specify it get IT and not something called "JUST THE SAME"

Every Sheet Fully Guaranteed

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

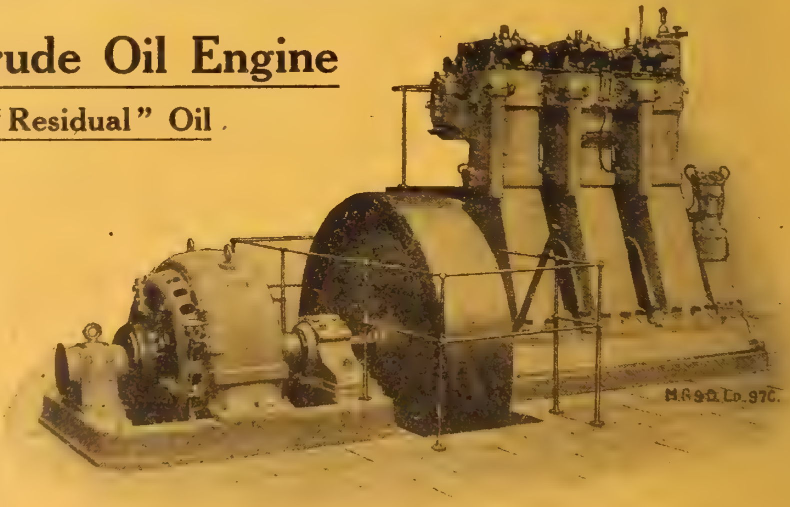
3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil



No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdown
Cheaper Buildings
 and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canada Wire Goods Mfg. Co. ... 52
Dennis Wire & Iron Works ... 16

Belting

Federal Engineering & Supplies, Ltd ... 51

Boilers

Inglis, John ... 22
Jenckes Machine Co ... 2
Marsh & Henthorn ... 51
McDougall Caledonian Iron Works ... 31
Mussens Limited ... 32
Taylor-Forbes Co ...
Waterous Engine Works Co ... 53

Brick

American Enamelled Brick Co. ...
Canadian Pressed Brick Co. ... 55
Don Valley Brick Works ... 7
Hamilton Pressed Brick Co ... 10
Milton Pressed Brick Co ... 54
Port Credit Pressed Brick Co. ... 55
Toronto Pressed Brick Co. ... 34

Bridges (Steel)

Canadian Bridge Co ... 18
Cleveland Bridge Co. ... 18
Dickson Bridge Works ...
Dominion Bridge Co ... 18
Phoenix Bridge and Iron Works ... 19
Pennsylvania Steel Co. ... 18

Builders' Hardware

Taylor-Forbes Co ...

Cement

Alsen Portland Cement Co ... 62
Britnell & Co ... 53
Bremner, Alex ... 59
Canada Cement Co ... 3
McNally & Co., W ... 55
Morrison & Co., T. A ... 60
Rogers, Alfred ... 4
Rogers Supply Co ... 31
Sand and Supplies ... 55

Conduits Page

Conduits Co., Limited ... 53

Concrete Mixers and Machinery

Canada Foundry Co ... 54
Cropp Concrete Machinery Co ... 6
Goold, Shapley & Muir ... 9
Hopkins & Co., F., H ... 64
Jenckes Machine Co ... 2
London Concrete Machinery Co ... 21
Mussens Limited ... 32
Morrison & Co., T. A ... 60
Rogers Supply Co ... 31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co. 61
Beath & Son, W D ...
Buffalo Steel Co ...
Canada Wire Goods Mfg. Co ... 15
Hamilton Iron & Steel Co ... 34
Trussed Concrete Steel Co ... 5

Contractors' Plant

Beatty & Sons, M. ... 52
Hepburn, John T ... 17
H. & E. Lifting Jack Co ... 19
Hopkins & Co., F. H ... 64
Katie Foundry Co ... 60
Marsh & Henthorn ... 51
Mussens Limited ... 32

Crushers (Stone and Rock)

Hopkins & Co., F. H ... 64
Jenckes Machine Co ... 2
Mussens Limited ... 32
Morrison & Co., T. A ... 60

Corrugated Iron

Galt Art Metal Co ... 20
Metallic Roofing Co ... 51
Metal Shingle and Siding Co ...
Ormsby, A. B., Limited ... 5
Roofers Supply Co ... 59

Contractors Page

McIlwraith, Jas. A ... 60

Drills

Beatty & Sons, M ... 52
Canadian Rand Co ... 1

Deafening Felts

Cabot, Samuel, Inc ... 55

Drilling Contractors

Harvey, J ... 61

Dredges

Beatty & Sons, M ... 52

Engines

Canadian Boving Co ... 2
Inglis, John ... 22
Jenckes Machine Co ... 2
Mussens Limited ... 32
Waterous Engine Works Co ... 53

Excavators

Harris, J. W ... 11

Electrical Apparatus and Supplies

Northern Electric & Mfg. Co ...

Engineers (Civil and Mechanical

Barber & Young ... 60
Chipman & Power ... 60
Bowman & Connor ... 60
Davis & Johnston ... 60
Farmer, John T ... 60
Fuce, Edw. O ... 60
Galt Engineering Co., John ... 60
Glaubitz, H. J ... 60
Hunt & Co., Robt. W ... 55
Inglis, John ... 22
Lea & Ferguson ... 60
Mace, T. Harry ... 60
Mitchell, C. H ... 60
McRae, John B ... 60
Moore & Scollan ... 60
Nadel & Adler ... 60

Fire Apparatus Pag

Morrison & Co., T. A ... 60
Seagrave, W. E ... 16

Fireproof Doors and Windows

Douglas Bros ... 14
Mussens Limited ... 32
Ormsby, A. B ... 5

Granite and Marble

Laurentian Granite Co ... 60
Missisquoi Marble Co ... 13
Rogers Supply Co ... 31
Smith Marble & Construction Co ... 17

Glass

Chance Brothers & Co ...
Consolidated Plate Glass Co ...
Luxfer Prism Co ...
Thompson & Co., B. & S. H ...
Toronto Plate Glass Importing Co ... 1

Heating Apparatus

Jenckes Machine Co ... 2
Taylor-Forbes Co ...

Hoisting Machinery

Beatty & Sons, M ... 52
Inglis, John ... 22
Jenckes Machine Co ... 2
Hopkins & Co., F. H ... 64
Marsh & Henthorn ... 51
Mussens Limited ... 32
Scott Machine Co ... 57

Hydrants

Canada Iron Corporation ... 59
Gartshore-Thompson Pipe Co ... 58
Kerr Engine Co ... 8

Lime

Christie, Henderson & Co ... 17
Jamieson Lime Co ... 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

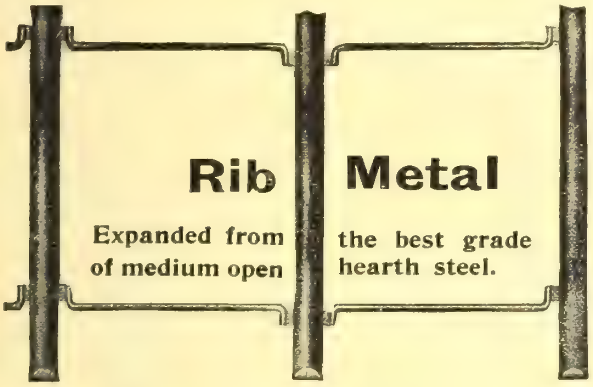
ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



Rib Metal

Expanded from the best grade of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

From Niagara to the Sea

"September the most beautiful month of the year on the St. Lawrence"

Through the famous 1000 Islands and "Shooting the Rapids" of the St. Lawrence to Montreal, Quebec and the marvelous Saguenay

Via the

RICHELIEU & ONTARIO NAV. CO.

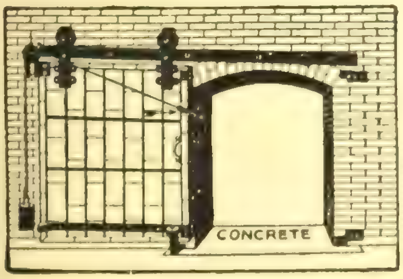
For full Particulars, Rates, Folders, etc. apply

THOMAS HENRY,
Traffic Manager, Montreal

JOS. F. DOLAN,
City Passenger Agent

What does the Underwriters Label on Fire Doors Mean Anyhow

It means that the DOORS are inspected at our factory during their construction by the **Fire Underwriters' Representative.** They are inspected by them after they are hung. **Every detail** has got to be **right** in every respect. We guarantee you this, guarantee you DOORS that mean the maximum reduction in Insurance rates and DOORS that are fireproof.



Specify the Ormsby **"Underwriters"** Fireproof Doors and Windows.

A. B. ORMSBY, Limited
Experts in Fireproof Windows and Doors
Factories - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish Page

Batts Limited 16
Boake Lumber Co
D. Laplante, Ltd 20
Eaton & Sons, J. R. 21
Georgian Bay Shook Mills 63
Rhodes Curry & Co 5
Sanitary Floor Co. 62
Siemon Bros. 57
Woodstock Lumber Co. 62

Metal Lath

Galt Art Metal 20
Metallic Roofing Co. 51
Noble C. W. 20

Meters

Hopkins & Co., F. H. 64
Neptune Meter Co 52

Paving and Paving Materials

Dominion Carbolineum Works
Metropolitan Paving Brick Co. 15
Ontario Asphalt Block Co. 62
Silica Barytic Stone Co., of Ontario. 61

Plaster

Albert Mfg. Co.
Britnell & Co 53

Pipe

Canadian Pipe Co. 58
Dominion Wood Pipe Co. 9
Gartshore-Thomson Pipe Co. 58
Municipal Construction Co. 16
National Iron Works 59
Pacific Coast Pipe Co. 1

Power Engines

Inglis Co., John 22

Paints and Varnishes

Cabot, Samuel, Inc. 55
Glidden Varnish Co.
Paterson Mfg. Co.

Pile Driving Page

Lincoln Construction Co. 16

Pumps and Pumping Machinery

Beatty & Sons, M. 52
Goulds Pump Co.
Hopkins & Co., F. H. 64
Inglis Co., John 22
Martin Steam Pump Co. 57
McDougall Caledonian Iron Works, John 31
Mussens Limited 32
Ontario Wind Engine & Pump Co. 57
Smart-Turner Machine Co. 1
Waterous Engine Works Co. 53

Roofing Materials

Barrett Mfg. Co.
Brantford Roofing Co 11
Galt Art Metal Co. 20
Metallic Roofing Co. 51
Metal Shingle & Siding Co.
Noble, Clarence W 20
Rogers Supply Co. 31
Roofers Supply Co. 59

Railway Supplies

Gartshore, John J. 60
Hopkins & Co., F. H. 64
Mussens Limited 32

Road Machinery

American Road Machinery Co. 10
Case Threshing Machine Co. 58
Climax Road Machine Co. 58
Morrison & Co., T. A. 60
Mussens Limited 32

Sewer Pipe

American Sewer Pipe Co. 56
Britnell & Co 53
Canada Iron Corporation 59
Dominion Sewer Pipe Co. 56
Gartshore-Thomson Pipe Co. 58
Hamilton & Toronto Sewer Pipe Co. 57
National Iron Works 59
Ontario Sewer Pipe Co. 14
Rogers Supply Co. 31
Standard Drain Pipe Co. 56

Sand

Rogers Supply Co. 31
Sand & Supplies 55

Stone Page

Britnell & Co. 53
Christie, Henderson & Co. 17
Consolidated Stone Co. 20
Contractors' Supply Co. 59
Corinthian Stone Co. 52
Crushed Stone, Limited 55
Doolittle & Wilcox 59
Hagersville Contracting Co. 5
Laurentian Granite Co. 60
Maloney John 19
Morrison & Co., T. A. 60
Myers, Oakley 55
Rogers Supply Co. 31
Roman Stone Co 17
Sackville Freestone Co. 52
Sand and Supplies 55

Structural Iron and Steel

Buffalo Steel Co.
Dominion Bridge Co. 18
Hamilton Iron & Steel Co.
MacKinnon Holmes & Co. 19
Pennsylvania Steel Co. 18
Phoenix Bridge & Iron Works 19
Queen City Foundry Co. 60
Reid & Brown 60
Salter, W. H. 19

Shovels (Steam)

Beatty & Sons, M. 52
Hopkins & Co., F. H. 64
Mussens Limited 32

Shingle Stains

Cabot, Samuel, Inc. 55

Slate

Roofers Supply Co. 59

Steel Shingles and Ceilings

Galt Art Metal Co. 20

Safes and Vaults

Taylor, J & J

Stone Cutters

Bailey-Underwood Co. 62

Sheathing Papers

Cabot, Samuel, Inc. 55

Telephone Supplies

Northern Electric & Mfg Co.

Tiles

Smith Marble & Construction Co. 17
Woolliscroft & Son, G. 1

Tanks and Stand Pipes

Inglis, John 22
Jenckes Machine Co. 2
Marsh & Henthorn 51
McDougall Caledonian Iron Works. 31
Ontario Wind Engine & Pump Co. 19

Valves

Canada Iron Corporation 59
Gartshore-Thomson Pipe Co. 58
Kerr Engine Co. 8
Standard Fitting & Valve Co 63

Ventilating System

Gardiner & Gaskill 54

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc. 55

Wire Rope

Dominion Wire Rope Co. 64
Greening Wire Co., B. 62
Smith, Thos. & Wm.

Wire Guards and Screens

Canada Wire Goods Mfg. Co. 52

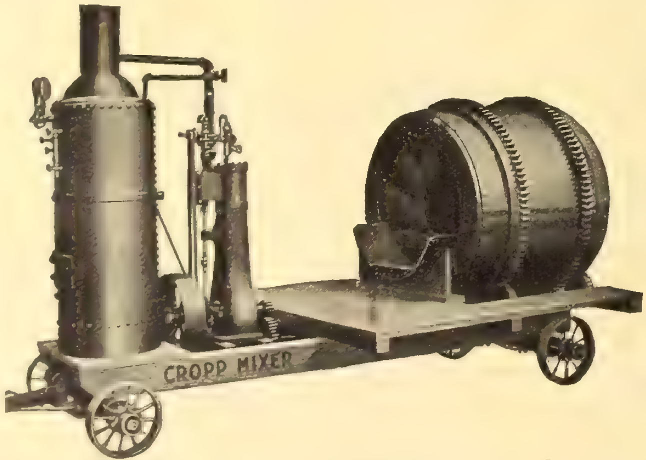
Water Wheels

Canadian Boving Co. 2

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co.,

84 Lasalle Street,
Chicago, Ill., U. S. A.

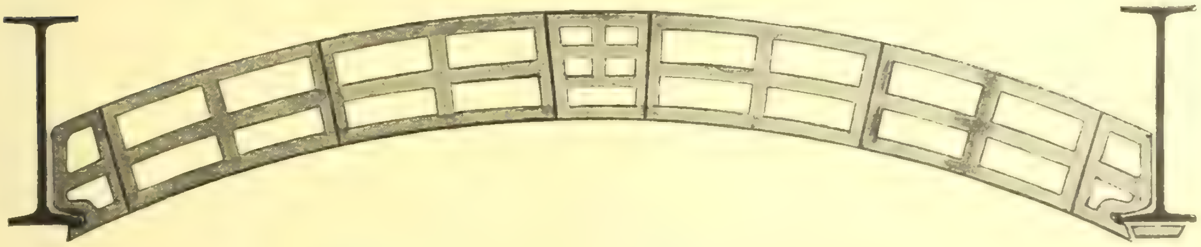
Nos. 109-11-13 West 18th Street, Kansas City, Mo.

MANNAN SMITH SUPPLY CO., St. Joseph Mo.

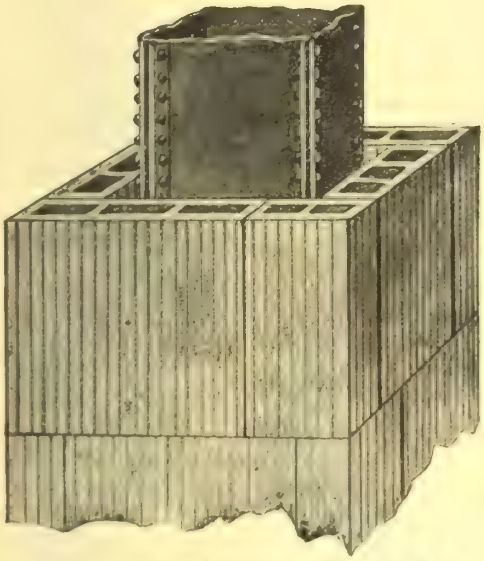
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

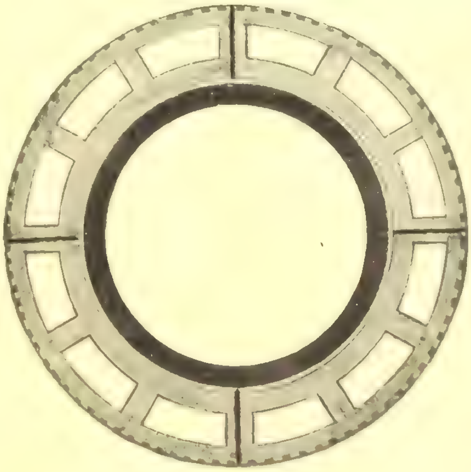


Section showing style of Skewbacks and Keys

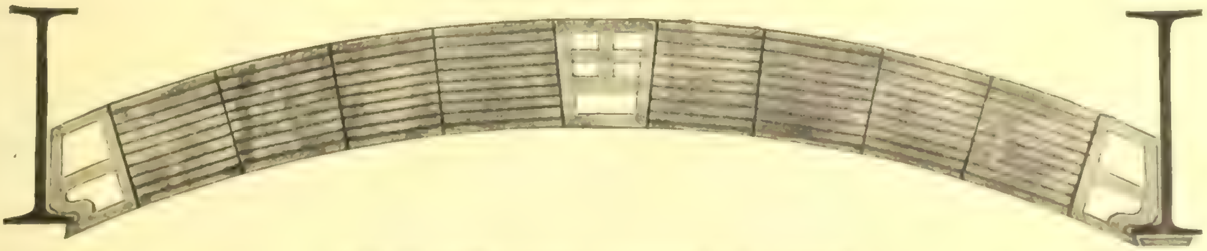


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



Section showing style of Skewbacks and Keys

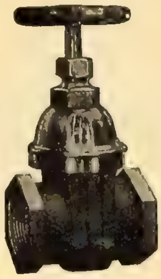
THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Water Crane and
Hydrant Combination

Compression
Hydrant



Webber Gate
(Brass)

Hub End Gate

K E R R

Our policy of careful manufacture for severe duty is maintained throughout our whole establishment and as a result our products are of the highest quality.

Every "Kerr" valve is accurately made and finished. They are perfectly tight when closed and have full area when open.

We have a complete catalogue

Have you a copy of it?

VALVES

THE KERR ENGINE CO. LIMITED

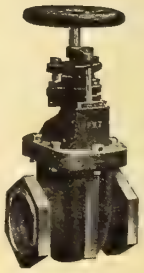
VALVE AND HYDRANT MANUFACTURERS

WALKERVILLE, ONT.

IRON

BODY

GATE

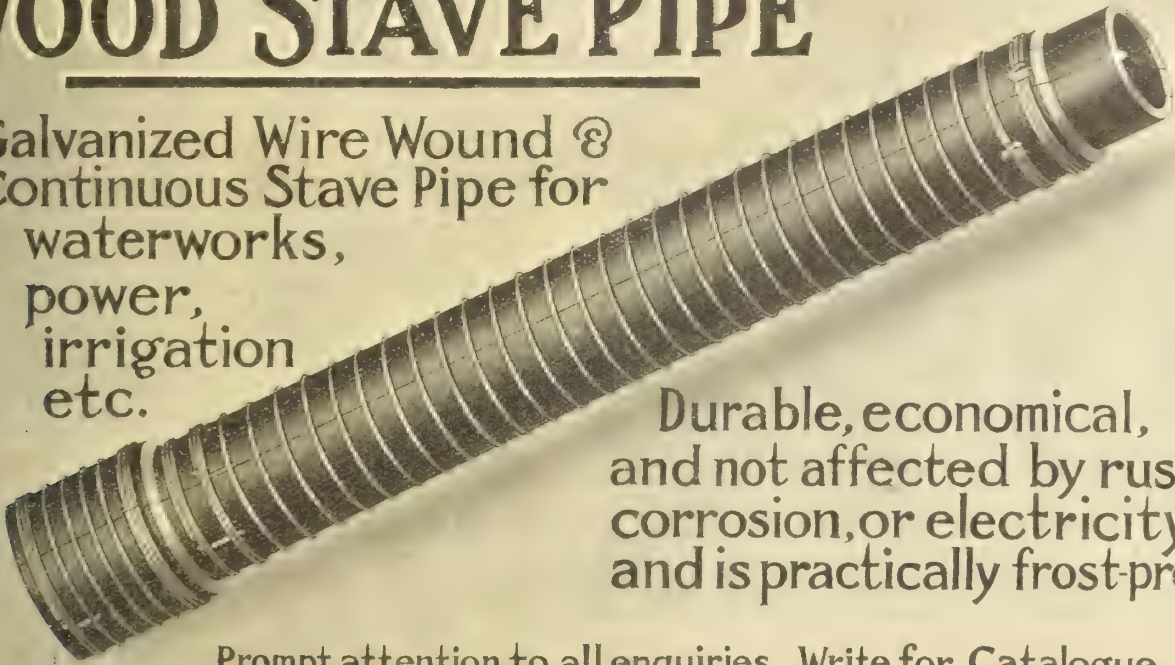


VALVES

Indicator Post for
Fire Protection Valve

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

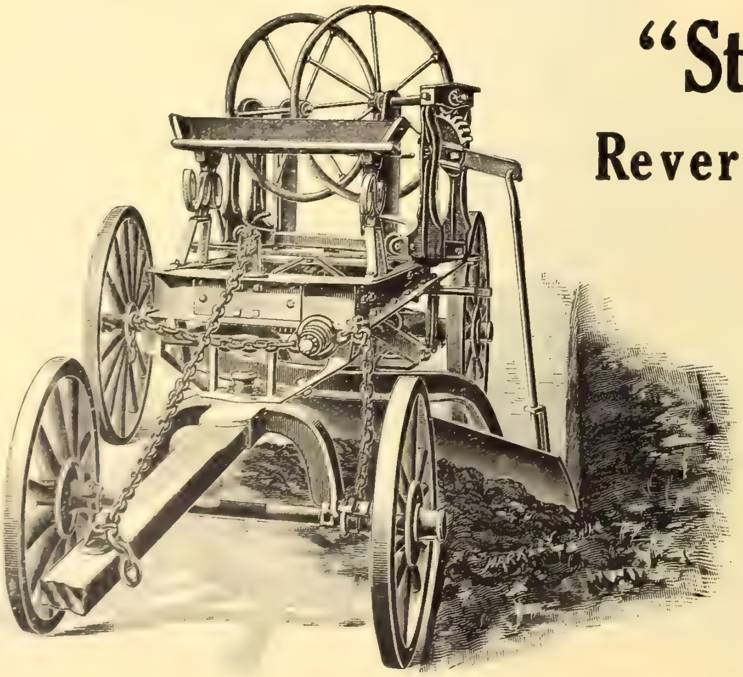
Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.

of Canada, Limited

Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

"Brantford Specification" is now the choice of many builders and contractors

Easily and quickly laid

For stores, factories, and other buildings with flat roofs, Brantford Specification is particularly suitable. It makes a durable, lasting roof-protection at the minimum of expense.

Either Brantford ASPHALT Roofing or Brantford RUBBER Roofing is used for Brantford Specification. It is laid double, with Branroco Cement between laps. The nails are two to three inches apart and all nail heads are covered. By following our instructions for laying, the job can be easily and quickly done, and the roof made absolutely waterproof.

No coal tar is used for Brantford Specification. Coal tar gets soft and melts in summer, and becomes brittle and cracks in winter. Our saturation is 99 per cent. pure Asphalt. Asphalt of this quality and purity does not melt in summer nor crack in winter. It is the most durable saturation known.

The material for Brantford Specification retails from $5.00 to $7.50 per square, according to the thickness of the roofing. Brantford ASPHALT and Brantford RUBBER Roofing are both made in 1, 2 and 3 ply.

Further information about Brantford Specification will be promptly furnished on request.

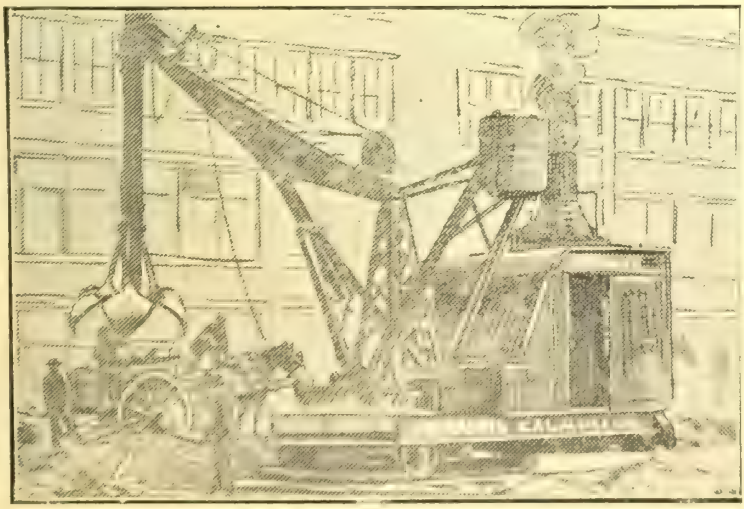
Brantford Roofing Company, Limited
Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

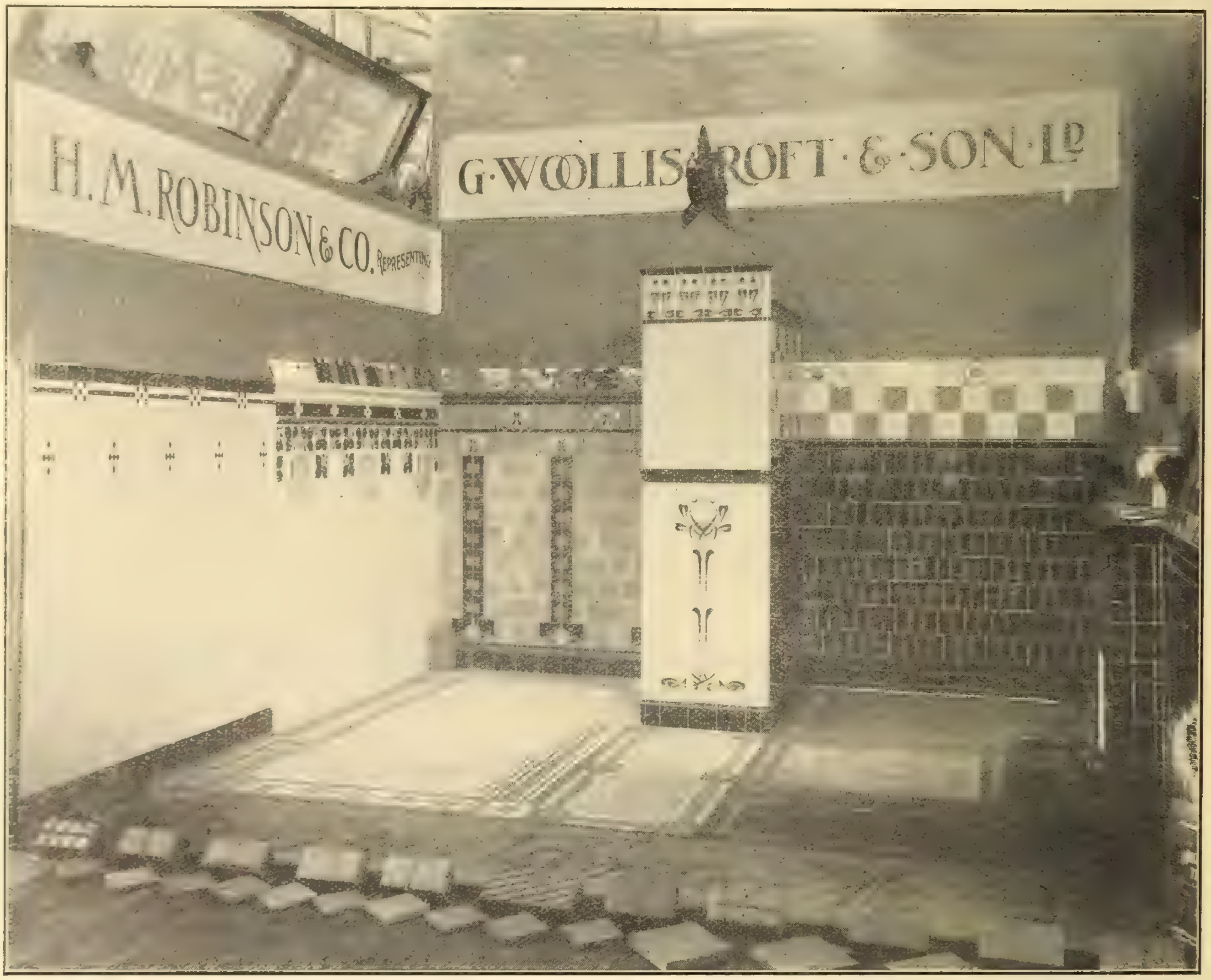
For further information apply:

J. W. Harris Mfg. Company, Ltd.
MONTREAL

G. Woolliscroft & Son

Limited

Cables: "BLIZZARD LONDON" **Hanley, Staffordshire, England** A B C Code: 5th Edition



Our Exhibit at the Canadian National Exhibition, Toronto, 1910.

TILES—for Walls, Floors, Ceilings and Roofs.

FAIENCE—Highly Glazed, also in **"PENTILICON"** or Marble Finish.

TERRA COTTA—Red, Buff and Stone Color.

"GLOW" FIRES with Tile or Faience Surrounds in Endless Variety of Color and Design to suit all Canadian tastes.

PAVING BLOCKS for **ROADS,** these have beaten the American in the Standard Tests.

Toronto Representatives:

H. M. Robinson & Company, 49 Colborne St.

Marble Exteriors

These have not become nearly so general in the Canadian cities, up to the present, as they are in Europe and the United States, partly because of the great cost of imported marble, partly because of the difficulty and delay in delivery.

These difficulties are, however, now entirely removed. Our beautiful light grey marble is being sold at a price which makes marble a material of general availability.

Our new plant, giving us a total equipment of 18 gang saws, besides circular saws, rubbing beds, planers, lathes, carborundum machine, pneumatic tools, electric cranes, etc., puts us in a position to finish 2,000 cubic feet of material every week.

The test of the material made at McGill University, showed a resistance of 22,000 lbs. to the cubic inch, a strength equal to the best grades of granite. The absorption test was very low.

We have put in several moderate sized exterior jobs, which have given the architects and owners entire satisfaction.

Our method is to furnish the material, all finished, ready for setting, f.o.b. car at any desired destination.

We are always pleased to make up prices.

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**
85 Sparks Street, Ottawa, Ont.

District Sales Agents :

Bosse & Banks, Quebec, Que.
Jas. Robertson & Co., St. John, N. B.
Walker & Barnes, Edmonton, Alta.
G. R. Duncan, Fort William, Ont.
Eadie-Douglas Co., Toronto, Ont.
General Contractors' Supply Co., Halifax, N.S.
Wm. N. O'Neil & Co., Vancouver, B.C.
C. N. Barclay, Winnipeg, Man.

Sewer and Culvert Pipe

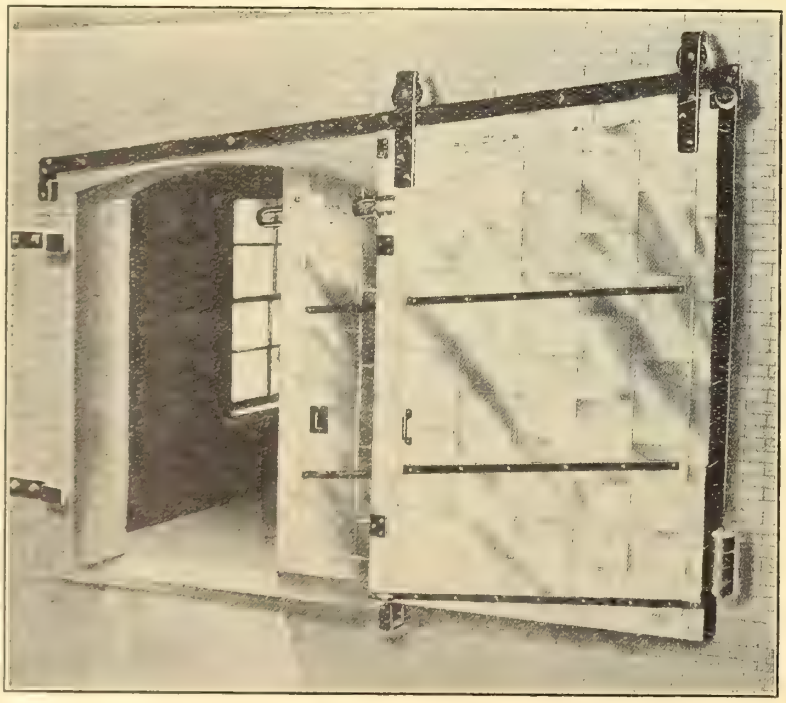
made of

FINE PLASTIC CLAY and WELL BURNED are about as DURABLE as the pyramids. They are the only class of pipe on which the ACIDS and GASES of SEWAGE HAS NO EFFECT. If you want a PERMANENT job and the kind of clay goods that are SURE TO PLEASE, write us for particulars.

Large Stock 4 inch to 24 inch, always on hand.

Telephone Toronto Connection, Parkdale 422.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO



Specialists on Fireproof Doors and Windows

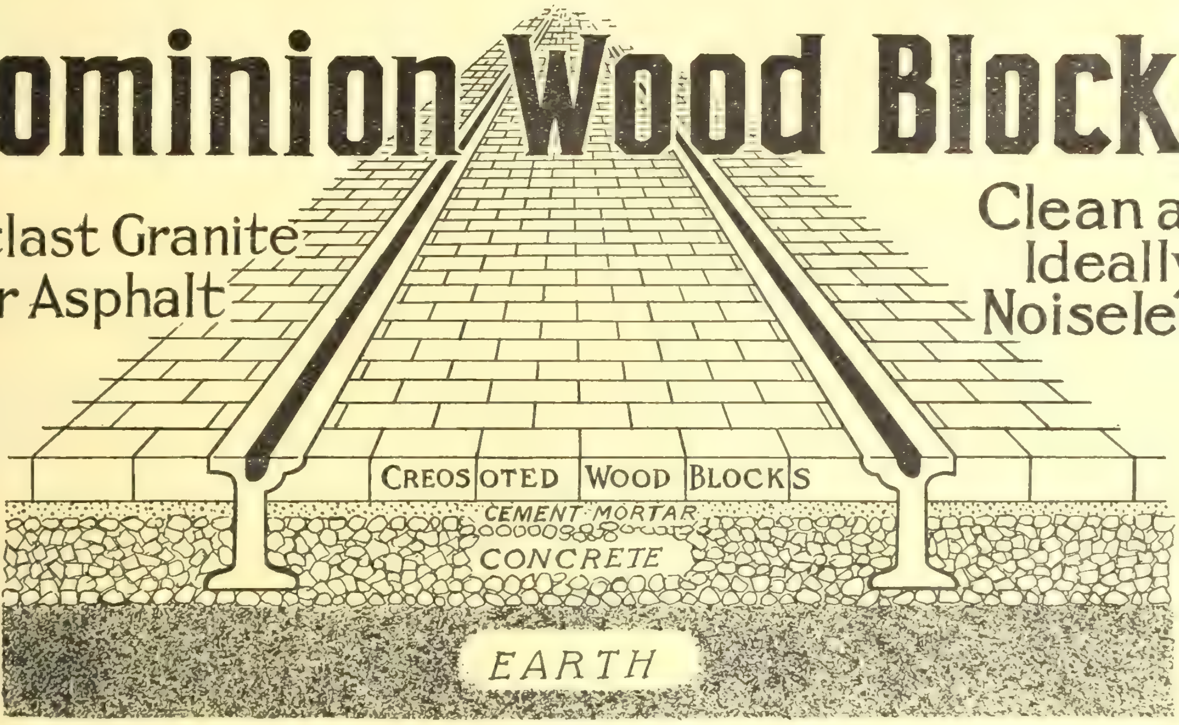
No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Dominion Wood Blocks

Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless



Dominion Wood Blocks make an ideal pavement.

Owing to the elasticity of the wood they will not pulverize.

Make relaying after excavating for water connections etc. easy and inexpensive.

Impervious to water.

Noisless as tan bark.

Impregnated with creosote which prevents decay.

Outlast asphalt or brick pavement.

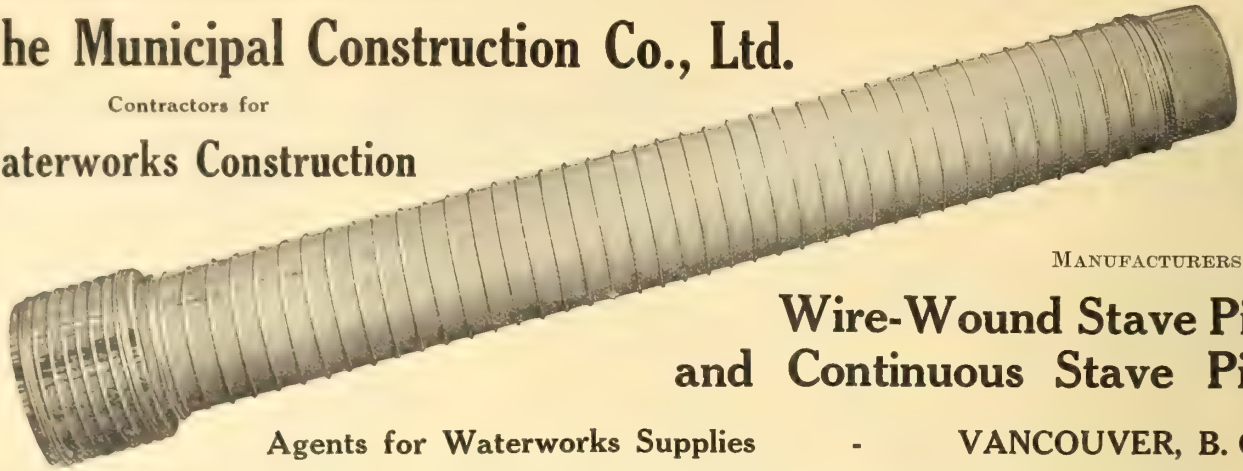
Native line Douglas Fir logs used for their manufacture.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction



Manufacturers of

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

DENNIS-LONDON ORNAMENTAL IRON

The **Dennis Wire & Iron Works Co.** Limited

London, Canada

Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

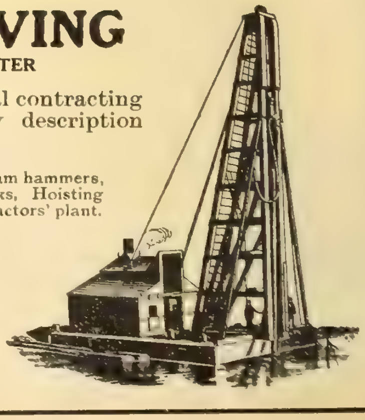
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



The Calkins Tile & Mosaic Co., Limited

Wall Tiles, Hexagon Floor Tiles, Quarries, Ceramic Mosaic, Marble Mosaic

Interior Marble, Slate and Granite Work

The
Smith Marble & Construction Company, Limited
458 Bleury Street, Montreal

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone
(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

The New State Concrete Mixer

—saves time
—saves labour
—saves money

It does away with guesswork. Is strong—efficient—handy as a wheelbarrow. It will pay for itself on a single job by

larger output—
better work—
reduced cost—

Write to-day for full particulars.

JOHN T. HEPBURN
18-40 Van Horne St., Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.

Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

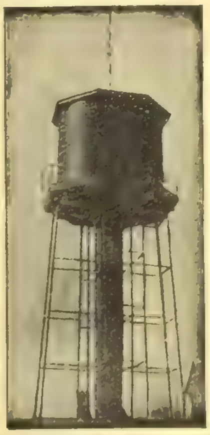
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**
Office Phone P. 64 Residence P. 1040



Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

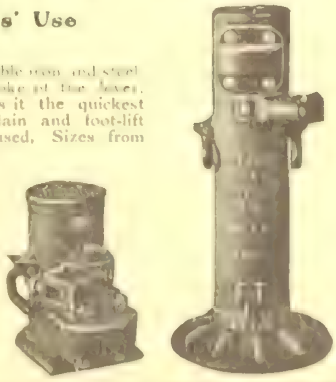
Made by practical Jack Builders. Material best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal



"Lead and Steel Die Process"

"GALT"

Embossed Steel Ceilings

Artistically and practically a little ahead of anything else in this line being made in Canada. The clean, sharp embossing that distinguishes "Galt" Ceilings and Walls is produced between **Lead** and **Steel Die**, therefore—always uniform in depth, bold and clear-cut in appearance and free from cracks.

Machine-Cut Beads—another patented improvement. They make erection easier, 25% cheaper and a perfect job surer.

In art-work and mechanical production "Galt" Ceilings represent the latest developments in metal ceilings. Why be satisfied with old-fashioned stuff when the modern is here and costs less? Get our estimates on your work.

The Galt Art Metal Co., Limited
Galt, Ont.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue Hunter Buff and Blue Oolitic Limestone

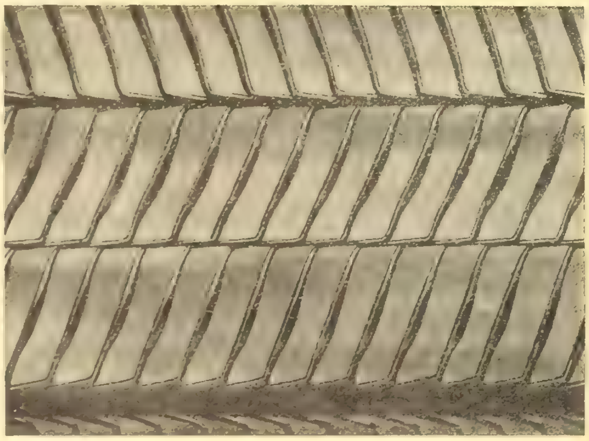
The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange



Herringbone Lath

Best for Cornices

Stiff in one direction—the ribs assure that—pliable in the other direction on account of the flattened filaments. Easily bent around the brackets but stiff enough the other way to allow the brackets to be spaced well apart. And brackets cost money.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

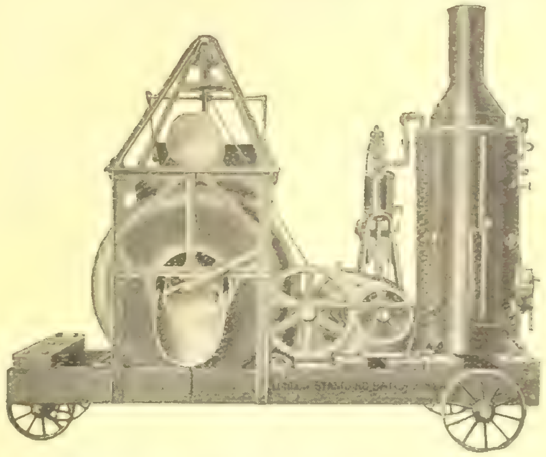
This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada



London Standard Drum Batch Concrete Mixer

Made in several sizes and with any equipment. This machine embodys the latest improvements in Batch mixers and is second to no other machine. Send for catalog stating capacity required.

We ALSO MANUFACTURE the now famous LONDON AUTOMATIC BATCH MIXERS Nos. 1 and 2, also Face-down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machine, Hand Drain Tile Machine, Sill and Lintel Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent, 52½ Princess St., Winnipeg, Man.	Geo. B. Oland & Co. 28 Bedford Row, Halifax, N. S.	A.G. Brown & Co., 1048 Westminster Ave., Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

DURABLE FLOORS

ARE MADE OF

Thin "Empire" Flooring

This flooring is ⅜ inch thick, just a little thicker than a carpet, and can be laid on an old floor without disturbing or mutilating the interior woodwork. Also used largely in new buildings.

Carpets wear out.
Hardwood floors last a lifetime.
Carpets are not sanitary.
Hardwood floors conserve health.
Carpets soon fade and deteriorate.
Hardwood floors are an asset of increasing value.
Carpets cause the house cleaning horror.
Hardwood floors emancipate the housewife.

Your Customers Will Appreciate

Thin "Empire" Flooring

Please Send for Samples and Prices

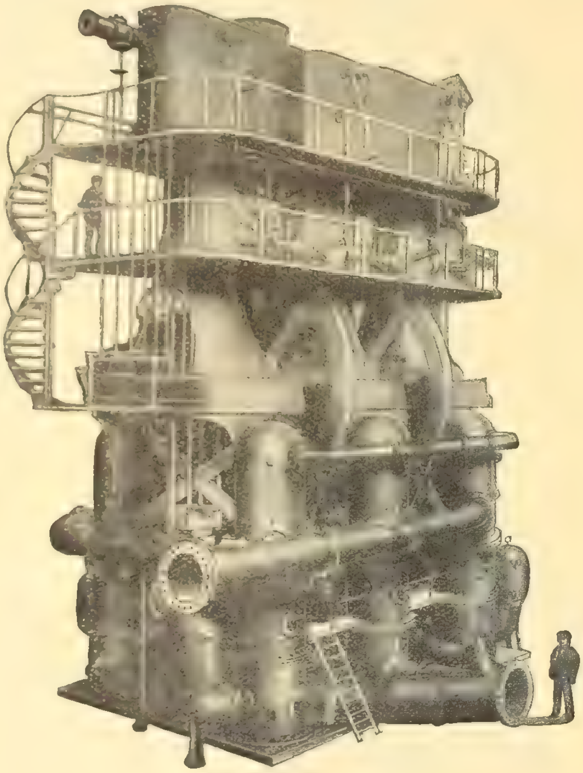
J. R. Eaton & Sons

Limited

Orillia, Ontario

Montreal Agent: C. A. SPENCER, 55 St. Francois Xavier St.

Waterworks Pumping Plants



CAPACITIES

from one to

15 Million Gallons

Per 24 Hours

Expert unbiased advice gladly given. Let us help you solve your waterworks difficulties. ::

The *high economy* attained with **"INGLIS"** Waterworks Pumping Engines is the result of correct design ; careful selection of materials and the highest grade of skilled labor.

We shall be glad to furnish full details of these engines, upon request

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.

The council will send the Mayor, Ald. Lott, and City Engineer Lindsay on a trip to other cities to inspect permanent pavements.

Estevan, Sask.

Tenders for purchase of $10,000 cement sidewalks debentures will be received until Sept. 27th. L. A. Duncan, secretary-treasurer.

Gleichen, Alta.

R. B. Owens, the provincial health engineer, has been consulted in regard to the new system of waterworks.

Ladysmith, B.C.

The council has employed Mr. Topp, of Victoria, to prepare estimates for about four miles of concrete sidewalks.

Montreal, Que.

The following firms tendered for steel and concrete work for new intake pipe: Haney, Quinlan & Robertson, $186,500; Laurin & Leitch, $169,463; Lemoine & Sons, $155,000; Harris & Company, $197,623; Beaudry, Leman, $185,000; M. Connelly, $184,200. Besides this Munderloh & Company and John Inglis Company tendered for parts of the work.

Napanee, Ont.

Tenders will be received by W. A. Crange, town clerk, up to September 30th, for the construction and completion of various sewers in the town of Napanee. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

New Liskeard, Ont.

Tenders were called until Sept. 27th for supply and laying of pipe for waterworks extension; also for supply and laying of pipe for sewer extension. C. H. Fullerton, town engineer; F. W. Ferguson, secretary Water Commission.

Oakville, Ont.

The town council passed additional bylaws to raise $20,000, by debentures for further extending the present waterworks system.

Oshawa, Ont.

Tenders will be received by Frank Campbell, town engineer, up to October 14th, for the construction of various sewers and manholes, etc., in the town of Oshawa. For further particulars see "Tenders and For Sale Department" of this issue.

Prince Albert, Sask.

Tenders will be received until September 30th for the supply and erection of two centrifugal, electrically-driven, automatic control sewage pumps. C. O. Davidson, city clerk.

Prince Albert, Sask.

On October 8th a by-law to expend $26,300 for the purpose of constructing extensions to waterworks system will be submitted to the ratepayers, also for $110,000 for trunk sewer system, and $12,000 for filtration plant.

St. James, Man.

Tenders are being called by F. Ness, secretary-treasurer, until October 4th, to sink two wells in the municipality.

Tenders addressed to F. Ness, secretary-treasurer, will be received until October 4th for reinforced concrete culvert on public road at lot 60, St. Charles. Plans, etc., at office of above or at Public Works Department.

St. Andrews, N.B.

The council passed a resolution giving authority for the C.P.R. to excavate and lay water mains in the streets necessary for the projected water system from Chamcook Lake. Elliott Hume was appointed representative of the town. Engineer Lumsden is C.P.R. engineer. Noted in issue of Sept. 14th.

Toronto, Ont.

Tenders are being called by Board of Works until October 4th for construction of asphalt pavements, bitulithic pavements, brick block pavements, grading concrete pavements, concrete curbs, concrete walks, and sewers. G. R. Geary, mayor.

On the City Engineer's suggestion the Board of Control have decided to ask the Dominion Government for permission to build a temporary sand dam across the western channel to keep sewage from affecting the water supply.

At the last meeting of the council it was decided to submit a by-law to the taxpayers on January 1 for power to issue debentures for $100,000 for the construction of good roads leading into the city, in accordance with the agreement reached between the members of the York County Council and the Provincial Government, for the creation of a number of good roads just outside the city limits. The recommendation of the city engineer that the Rosehill reservoir be concreted and that the city contractors be given a share of the work, was carried.

Victoria, B.C.

The council decided to lay permanent sidewalks on a number of streets in Hollywood Park, of which the estimated cost is $22,000. The work of putting sewers in the same section will wait for the report from the city engineer on the whole problem of sewer extension.

The old by-law which provided for the laying of tar macadam for improvement of roadway on Menzies street and others will be altered to allow for a more modern type of pavement. Asphalt is suggested.

The large brick drain on Burnside road will be extended 600 feet at an estimated cost of $3,000.

Tenders addressed to W. W. [illegible], will be received until October 24th for the following: brass goods, galvanized fittings, lead pipe, galvanized iron pipe. Specifications at office of above.

Welland, Ont.

Tenders will be received by the Board of Water Commissioners of this town for the supply of c. i. pipe, special castings and flexible pipes. For further particulars see "Tenders and Fore Sale Department" of this issue.

A by-law was passed authorizing an expenditure of $52,000, for building new concrete flume, installing new pumps and laying 14-inch water pipe from canal to pumping station. Work on new flume and laying piping to be done at once. B. Lundy, secretary Board of Water Commissioners.

Tenders are being asked by the Board of Water Commissioners for 2,000 lineal feet 6-inch and 2,900 lineal feet 14-inch cast iron water pipe and specials for same; also 300 feet 14-inch flexible pipe for crossing canal.

Winnipeg, Man.

The city engineer is now preparing a list of all the water mains required to complete the works ordered this year by council. When the list is made out tenders will be called for. There are several thousand feet of four, five and six inch mains required.

AWARDED

Hull, Que.

Mr. E. R. Bisson, of Hull, was given the contract for the repairs to old waterworks plant.

Montreal, Que.

The Board of Control have recommended that R. E. Tessier be given the contract for new pumping station at $4,475; with concrete work at $7.50 per cubic yard. Others tendered as follows: Montreal Ship Lining Company, $4.640; with concrete work at $10 per cubic yard; Felix Sauvageau, $4,700; with concrete work at $8.50 per cubic yard.

The Board of Control have recommended that the contract for new aqueduct intake at Point St. Charles be awarded to L. A. Desy and M. Lemoyne at the cost of $155,500. Waterworks superintendent, Mr. G. Janin.

Trenton, Ont.

G. Crow & Son, this town, have been awarded contract for constructing the sewerage system, which includes the laying of 824 feet of 15-inch, 1,434 feet of 12-inch, 987 feet of 8-inch pipes and manholes, as well as the building of a sedimentation tank. Others tendered as follows: G. Crow & Son, Trenton, $4,215; E. B. Merril, Toronto, $4,536; H. Taylor, Belleville, $5,100; J. W. Liton, Kingston, $7,045.

Toronto, Ont.

The City Engineer will construct the following pavements at the prices named:—[illegible] avenue, [illegible] road, asphalt, [illegible]; [illegible] avenue, from Westmoreland avenue to Bartlett, asphalt, $2,388; Westminster avenue, Indian road to Keele street, asphalt, [illegible]; Lonsdale, Lawton avenue to Dunvegan road, bitulithic, $16,820.

Virden, Man.

Prices per cubic yard for grading and [illegible] received from the following: E. H. Palmer, 14c., accepted; A. D.

Lancaster, 23½c.; W. A. Cook, 14½c.; A. [illegible], 16½c.; R. Ferguson, 19c.

Victoria, B.C.
The tender of the Pacific Coast Construction Company for grading and sidewalking Forbes, Asquith, Cecil and Victor streets was accepted, while that of the city engineer for improvements to Sutlej street was successful.

Railroads, Bridges and Wharves

Bell Brook, N.B.
Tenders are being called by Department of Public Works, Fredericton, until Oct. 10th for rebuilding bridge here. Plans, etc., at office of the above and at office of G. B. Jones, M.P.P., Apohaqui. John Morrissy, chief commissioner.

Barrington's Cove, N.S.
Tenders are being called by the Public Works Department, Ottawa, until October 17th for construction of wharf here. R. C. Desrochers, secretary.

Comox, B.C.
The C.P.R. is calling for tenders for the construction of a branch to Comox.

Cartwright, Man.
Tenders addressed to J. B. Laughlin, clerk, will be received until October 8th for steel superstructure of a 58-foot span bridge, one mile northeast from here. Material to be in by Nov. 15th. Plans, etc., at Department of Public Works.

Chilliwack, B.C.
Within the next 30 days the Canadian Northern Railway will call for tenders for the construction of its line between here and Lytton, at the junction of the Fraser and Thompson rivers, a distance of about 90 miles. It is probable that tenders will also be called this fall for the 90-mile section extending north from Kamloops through the valley of the North Thompson.

Esquimalt, B.C.
The Messrs. Bullen, ship repairers, of Vancouver, have applied for a subsidy for a dock of the first or largest class,to be located here. They intimate that they will file plans shortly. It is believed that the Bullens are associated with some British shipbuilding firm in their enterprises, which will involve an expenditure of at least $3,000,000.

Fort William, Ont.
Tenders are being called by the C.P.R. until October 3rd for bridge over McKellar river here. Plans, etc., at office of F. Lee, division engineer, Winnipeg; and at office of Superintendent, Fort William.

Halifax, N.S.
At the meeting of the council of the Board of Trade a letter was read from the management of the Intercolonial, stating that the Board of Management was working on plans with the view of increasing the facilities at the piers for the coming winter.

Margaree Harbor, N.S.
Tenders are being called by Public Works Department until October 5th for extension to breakwater here. R. C. Desrochers, secretary.

Montreal, Que.
It is understood that the principals in the company incorporated as the British Empire Bridge Company, Limited, this week are the British Construction Company, of Darlington, Eng., and the Railway Carriage Company, of Birmingham, and that their object in obtaining a Canadian charter is to facilitate their plan of tendering for the superstructure of the Quebec bridge.

New Edinburgh, N.S.
Tenders are called until October 12 for construction of breakwater here by Public Works Department. R. C. Desrochers.

Prince Albert, Sask.
George Atwood, chief engineer of the Hudson Bay & Pacific Railroad, is authority for the statement that he has been authorized to expend any moneys necessary to complete a detailed survey for a route from Prince Albert to Fort Churchill.

Point St. Charles, Que.
A petition is being circulated to connect Shearer and Congregation streets by a subway. Mr. W. Darlington, Coleraine street, is interested.

River des Prairies, Que.
Tenders are being called by the Public Works Deparement, Ottawa, until October 17th for reconstruction of piers at Ste. Genevieve and Ile Bizard. R. C. Deshochers, secretary.

Regina, Sask.
The Railway Commission have issued an order for the building of a subway under the Canadian Pacific Railway tracks at Broad street. The plans are to be filed within 60 days, and an apportionment of the cost as between the railway company and the city will be settled by the commission after the plans are submitted. The proposed subway will provide for nineteen tracks.

Salmon River, N.B.
Tenders are being called by the Department of Public Works, Ottawa, until Oct. 18th, for construction of breakwater here. R. C. Desrochers, secretary.

St. Leonard's, N.B.
Bids for the construction of the bridge between Van Buren, in Aroostook county, and St. Leonard's (N.B.), over the St. John river, have been opened. On the superstructure, foundations and abutments Elie Roy, Lewiston, bide $22,245; Powers & Brewer, of Grand Falls (N.B.), $23,895; E. J. O'Kelley, of Toronto, $25,145, and J. L. Perkins & Son, of Fairfield, $30,598. On the superstructure the Canton Bridge Company, of Canton, $51,082; Boston Bridge Company, $47,452; Pennsylvania Steel Company, $54,000; American Bridge Company of New York, $50,000; Penn Bridge Company, of Beever Falls (Pa.), $40,991. The amount appropriated was $37,500. New Brunswick to expend a like sum. Award not likely to be made for ten days or more.

Toronto, Ont.
The Island Committee will ask the Board of Control to place on the estimates the necessary amount for bridge at island. Engineer's estimate, $9,268.

The G.T.R. has commenced operations on the elevation and depression of tracks from Weston towards the city.

Victoria, B.C.
Tenders addressed to W. W. Northcott, will be received until October 3rd for building the Dallas road sea wall. Specifications at office of above. Estimated cost, $100,000.

AWARDED

Colchester, Ont.
The contract for the construction of an extension to the pier has been awarded to Messrs. Michael, Matthew J., and Patrick J. O'Leary, of Ottawa, at $14,500.

Edmonton, Alta.
The contract for pile driving in connection with high level bridge has been awarded to the Raymond Concrete Pile Company, of Montreal. In all there will be 1,800 piles.

Halifax, N.S.
The contract for construction of wharf at Dover has been awarded to Messrs. Girroir & Sweet, of Antigonish, at $3,836; that for Port Felix at $4,309.

Wallaceburg, Ont.
The contract for building two steel bridges over Running Creek drudge cut. Wallaceburg, has been awarded to the Petrolia Bridge Company, Limited, for the sum of $4,550.

Public Buildings, Churches, Schools, etc.

Ahuntsic, Que.
Mr. L. R. Montbriant, architect, 230 St. Andre street, has prepared plans and specifications for the erection of a school building for the Catholic school commissioners.

Calgary, Alta.
A permit has been granted for the one-storey addition to the Y.M.C.A., $19,000.

Dresden, Ont.
This municipality will have a new post office. It is expected that work will commence immediately. D. A. Gordon, M.P.

Eastview, Ont.
W. Leger will enlarge considerably the planing mill he recently purchased here.

Elmira, Ont.
Tenders are called until Sept. 29th for the construction of lavatories in the Elmira public school. Plans and specifications can be seen at Israel Brubacher's, Elmira, or Chas. Magk, Waterloo.

Fernie, B.C.
The by-law to establish a public library was defeated.

Fredericton, N.B.
The council are considering the advisability of the erection of a new market building.

Fergus, Ont.
It is stated that Messrs. Whalen & Bleakney, of Ottawa, the successful contractors for the post office here, have not yet let the sub-contracts. The above firm have also contract for the post office at Elora. Cost respectively, $13,449 and $12,949.

Fort William, Ont.
The by-laws approved by the ratepayers on the 22nd inst. provide for an expenditure of about $160,000; of this $65,000 will be expended on police and court house purposes and $16,000 for fire hall purposes. The plans prepared by Architect Mason for the new police station were approved and tenders will be called for.

The time for receiving tenders for fire hall alterations and additions has been extended until Sept. 28th. H. S. Hancock, city engineer.

Glenbank, B.C.
The Department of Public Works, Victoria, is calling for tenders for erection of 2-room school here until October 14th. F. C. Gamble, public works engineer.

Galt, Ont.
The committee in charge of the new theatre have decided not to build a new one, but to remodel the old Scott block, which was gutted by fire last spring.

Kingston, Ont.
Owing to the high rate of tendering on the Nicol Mining Building no contracts

have been awarded for the erection, the $40,000 donated not being sufficient.

Kaslo, B.C.

Tenders are being called by the Public Works Department until October 10th for erection of new court house here. Plans, etc., at offices of government agents here and at Nelson; and at the above department. F. C. Gamble, public works engineer.

London, Ont.

The Board of Works and the city architect were named a committee to draft an agreement with the county council regarding joint municipal buildings.

North Vancouver, B.C.

The residents are feeling the necessity for a new fire hall.

Ottawa, Ont.

Corporation of Ottawa was granted a building permit for fire station on Cumberland street, $24,000.

Mr. William Foran, Trafalgar Building, is the honorary secretary in connection with the proposed new golf club—Rivermead Golf Club—mentioned in last week's issue.

Prince Albert, Sask.

A By-law to raise $10,000 for alterations in connection with the city hall, will be submitted to the ratepayers on Oct. 7th.

Prince Rupert, B.C.

Thomas R. Hooper, architect, Victoria, is the authority for the statement that another school would likely be required here within the next year. The policy of the government is to build small schools in preference to large ones, so that each district will be comfortably served.

Regina, Sask.

The Board of Governors of the Saskatchewan Methodist College has approved of the plans of Messrs. Brown & Vallance, of Montreal, for two big buildings which are to be erected next year. It is expected that the buildings, to cost $250,000, will be completed by the fall of 1912.

St. Catharines, Ont.

The school board are considering the erection of a new school in St. James' Ward.

Stratford, Ont.

Mr. W. R. Marshall, a citizen of this city, has offered a site for the Children's Shelter.

South Vancouver, B.C.

The Oddfellows of Little Mountain decided to build a two-storey hall. Work on it will be started almost immediately. For this purpose a company will be incorporated at a capitalization of $7,000. A site has been purchased between Twenty-eighth and Twenty ninth avenues.

Toronto, Ont.

Tenders for carpentry work on the office building for fire department, fire alarm telegraph building, were received until Sept. 27th. R. Geary, mayor.

Tenders are being called for by W. C. Wilkinson, secretary-treasurer, up to Sept. 30th, for the construction and completion of new school buildings on Ossington avenue and on Annette street; hollow tile flooring at Humberside Collegiate Institute; work benches and cabinet work, etc., for four new manual training centres, in the city of Toronto. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

The Board of Education decided to add a third storey to the new Earlscourt school, the two storeys of which will be finished by flat roof. It is expected that next May tenders will be called for the extra storey.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until October 4th for new lathing and plastering together with repair, renewal, replacement and restoration, etc., in St. Lawrence Hall assembly room, lavatory, cloak room, etc. Plans, etc., at offices of Property Department, City Hall.

Building permit has been issued to the Greek Catholic Church, for a church building of brick and stone on Franklin avenue, near Royce avenue, $5,500.

Uxbridge, Ont.

Tenders addressed to H. Bascom, M.D., secretary, will be received until Oct. 4th for erection of 8-roomed brick school. Plans at office of the above.

Victoria, B.C.

Public Works Department are calling for tenders until October 3rd for erection of school at Otter Point. F. C. Gamble, public works engineer.

Permit was granted for the construction of Grace Lutheran church, corner of Queen's avenue and Blanchard street, $6,000. J. C. Keith, architect; contractor, L. P. Frederickson.

The directors are considering the proposition of a new building to supplement the Royal Jubilee hospital, which is overcrowded and out-of-date. J. A. Mars, president; Messrs. D. F. Campbell, Bolden, H. Robertson, Chas. Baxter and J. W. Vincent, directors.

Whitby, Ont.

The county council has been authorized to issue $20,000 court house debentures. John E. Farewell, county clerk.

Woodland, Man.

On October 1st a by-law will be voted on to issue $7,500 school debentures, Hanlan, S.D. Major P. Proctor, secretary-treasurer, rural municipality of Woodland.

Wallaceburg, Ont.

The by-law to raise $20,000 for erection of new public school in North Wallaceburg and addition to school in South Wallaceburg was approved by the electors. Tenders will shortly be called. H. E. Johnson, town clerk.

Winnipeg, Man.

The Anglican church have under consideration the erection of a cathedral here to mark the founding of the church in the West in 1820.

Tenders addressed to the Chairman, Board of Control, will be received until October 4th for supply of labor and materials for erection of fire alarm signal service station on Rupert street. Plans, etc., at office of Inspector of Buildings, 233 James avenue. M. Peterson, secretary.

The civic hospital committee will secure plans for the new isolation hospital. The directors of the North Winnipeg hospital recommend to the council that a bylaw for $350,000 be submitted to the ratepayers, the amount to be used for purchase of site and erection and equipment of a new general hospital. Ald. Potter, honorary president, North Winnipeg hospital.

Tenders for supplying the number of [illegible] required by the Public School Board for the next two years, will be received until October [illegible] R. H. Smith, secretary-treasurer, P.S.B.

AWARDED

Dubuc, Sask.

The contract for erection of solid brick school here was awarded to [illegible] & Sutherland, Regina, at $6,445. E. J. Reed & Company tendered at $8,450. Storey & Van Egmond, architects, Regina.

Montreal, Que.

The following contracts have been awarded in connection with construction of the new Young Men's Christian Association building on Drummond street: Carpentry, U. Pauze & Fils, Greene avenue and Notre Dame street; plastering, R. D. Clark & Sons, St. Luke street; painting and glazing, J. Lefebvre & Company, Mansfield street. Architects, Ross & McFarlane, 1 Belmont street.

New Liskeard, Ont.

Hill & Clarke, of New Liskeard, have been awarded general contract for Union Bank. The contract price, not including fixtures, $9,000. J. P. Maclaren, Ottawa, architect.

Nelson, B.C.

John Brown & Son have received a contract from James Malcolm to build a new wagon and blacksmith shop 50 by 80 feet.

Quebec, Que.

The tender of Joseph Gosselin & Son, of Levis, for the construction of the new annex to the Parliament House was accepted. Architects, Messrs. Marchand & Tanguay.

Souris, Man.

The contract for the excavation in connection with the new post office was let to J. W. Fitzgerald & Company. Kitchen Bros. will have the contract for brick and stone. Plans were drawn by Fitzgerald & Company; general contractors, Messrs. Pigott & Son, Hamilton, Ont.

St. Eusebe, Que.

The following contracts for the erection of a presbytery for the parish of St. Eusebe have been awarded by Mr. G. A. Monette, architect, 97 St. James street, Montreal, as follows: Masonry and brick, F. Dufresne; carpentry, E. Dusseault; plumbing, heating and roofing, Jos. Laurier; plastering, R. E. Marineou; painting and glazing, Joe. Guy; electric wiring, C. Lapierre.

Thorold, Ont.

Wm. Justice, this place, was given the contract for the masonry and carpentry on enlargement of vestry for St. John's church here, at $1,000. T. H. Wiley, architect, St. Catharines.

Victoria, B.C.

The contract for the new theatre, to seat 1,500 people, has been let to J. L. Skene. Contract calls for completion on January 1st, 1911.

Verdun, Que.

Messrs. Shearer, Brown & Wills, general contractors, 225 St. Patrick street, Montreal, have been awarded the contract for the construction of an addition to the English church at Verdun.

Yorkton, Sask.

The contract for electrical work in the collegiate institute has been awarded to Messrs. Stalker & Trott, electrical engineers, Winnipeg.

Residences

Edmonton, Alta.

Building permits were issued recently to [illegible] $2,000 ;W. Wilson, residence on Fifth St., [illegible]

Montreal, Que.

Mr. S. D. Joubert, of Mount Royal West, has taken out a permit for the erection of very handsome residence at 39 St. Catherine road, $10,000. Mr. James Sawyer, architect; Damien Lalonde, contractor.

Mr. G. A. Monette, architect, 97 St. James street, is preparing plans and specifications for the erection of a residence at Lachute, Que., for Mr. J. E. Valois.

Ottawa, Ont.
W. E. Noffke has been chosen architect for the remodelling of W. J. Fraser's residence on Nepean street.

H. P. Gilmour's residence on Wilbrod street will be converted into a double tenement. W. E. Noffke, architect.

Victoria, B.C.
Building permit was issued Smith Bros. for a dwelling on Cowan street, $2,550.

E. A. Harris, 1109 Langley street, has effected the sale of four lots at the corner of Vancouver and Humboldt streets, on which the owner, it is stated, is considering the erection of an apartment house.

Winnipeg, Man.
The Wellington Apartments was damaged by fire on the 19th inst., to the extent of $75,000. Six houses, valued at $5,000 each, in the same block were burned to the ground. Patterson & Hicks, owners and contractors, have begun work.

AWARDED

Vancouver, B.C.
John Watson & Bros. are the contractors for the brick apartment house to be erected corner of Broadway and Woodland for Dr. T. Glendon Moody. Henry B. Watson, 522 Pender street west, is the architect.

Business Buildings and Industrial Plants

Brandon, Man.
Robert Lane, who commenced the construction of a two-storey business block on Eighth street, south of Rosser and completed the excavation work, has decided that he will not go ahead with the construction of the building this year. The estimated cost of the new structure about $8,000. The tenders ran to $11,000. Mr. Lane has decided that the will let the work go until next year, when he will complete it.

Buckingham, Que.
The W. A. Graphite Company is erecting a large mill here.

Bala, Ont.
The summer hotel at Camp Sutton, Muskoka, was destroyed by fire. Loss $4,000.

Calgary, Alta.
J. Cabouski has been granted a permit for a $2,500 house on Thirteenth avenue east.

Collingwood, Ont.
The Board of Trade considered the draft agreement in regard to the proposed iron industry which is negotiating for a site here. President, Board of Trade, Mr. M. F. Byrnes; representative of the proposed industry, Mr. J. R. Roaf.

Blairmore, Alta.
The Western Canada Collieries, Limited, are calling for tenders until October 25th for the following: The building of twenty cottages; the building of six store buildings; the building of one residence; the excavation and diversion of river bed for a distance of about one mile. Plans, etc., at head office here.

Edmonton, Alta.
Adams Bros., it is reported, are planning to erect on 1st and Athabasca streets a 5-storey brick and stone business block. Cost about $80,000.

Fredericton, N.B.
This city has made a generous offer to the John Palmer Company, which will probably be accepted. In return for which arrangements for a new building to cost not less than $25,000 will be taken up in the spring.

Fort William, Ont.
The Coalette Company have bought a site on the Industrial land between Mary and Christina streets. The plant is expected to be ready by December.

High Falls, Que.
James Maclaren Company will begin in a few days the construction of a large log slide here.

Hamilton, Ont.
The Bell Telephone Company has purchased the Kronshein property on Main street, where, it is reported, the central exchange will be erected.

It is stated that A. Hewitt, the well known Grimsby millionaire, who built the Village Inn there, has secured an option on the property known as Wentworth Chambers, at Main and Hughson streets, and that on this site he will have erected a big modern hotel.

The Canadian Westinghouse Company secured a building permit for an addition to the foundry, to cost $18,000.

The Canada Steel Company will locate their plant on the west side of Sherman avenue. Estimated expenditure, $400,000. Directors: F. W. Baillie, Toronto, president; R. M. Bertram, Toronto, vice-president; W. M. Currie Hamilton, managing director; A. L. Malone, Toronto; G. A. Morrow, Toronto. Mr. Baillie is a member of the financial firm of Baillie, Wood & Croft. He is also a director of the Black Lake Asbestos Company, and prominently identified with many important industrial propositions. Mr. Bertram was formerly president of the Bertram Shipbuilding Company, and at present is the head of the Collins' Inlet Lumber Company. Commissioner of Industries, Mr. Mulliss.

Milestone, Sask.
A joint stock company has been formed for the purpose of erecting a temperance hotel here. Mayor, Mr. J. R. McKenzie,

Montreal, Que.
A permit has been taken out by Quinlan Bros. for erection of the Eastern Townships Bank, corner of Crescent and St. Catherine streets.

Messrs. Montreal Smallwares, Limited, are contemplating erecting two additional storeys on their new factory now in course of erection. Tenders are being invited for the heating and plumbing of the present work. Architect, H. C. Stone, 84 St. Francois Xaxier street.

Messrs. T. McAvity & Sons, Limited, St. John, N.B., will establish a branch of their large St. John works in Montreal. Negotiations are now on for a suitable site with exemption of taxes. Taken in connection with the new site secured at Port Arthur, this means an important extension of this firm's trade.

Masset, B.C.
It is understood that negotiations toward the erection of a mill here are well under way and that Victoria capital is identified with the new industrial enterprise. Indian Agent T. Deasy is promoting the enterprise.

Nelson, B.C.
Mr. A. Carrie, architect, has been asked to draw plans for the new business block to replace the Carney block. E. B. McDermid effected the sale and estimates the cost of new structure to be about $25,000.

Arrangements have been made and plans drawn for an enlargement to the C.P.R. depot building here. F. F. Busteed, general superintendent western lines, C.P.R.

The McGoldrick Lumber Company has purchased the Crawford bay site to use as a logging station for lumber cut in their limits. The company will now construct their mill at Fairview. T. C. Proctor is local agent. The company also operates mills at Chase, B.C., and at Spokane, Wash. U.S.A.

The establishment of a zinc smelter here is being considered. Mr. A. Gordon French, a metallurgical chemist, representing French's Complex Ore Reduction Company, organized by capitalists of Victoria, has been over the ground and considers it favorable.

New Liskeard, Ont.
Mr. C. B. Matthews, Kingslake, will in the near future build a mill without any aid from the town, for the granting of which a by-law was defeated.

Neepawa, Man.
It is reported that the match factory recently burned down at Selkirk will be built here.

Owen Sound, Ont.
The site for the new furniture factory has been chosen at corner of Second avenue west and Fourteenth street. Tenders are being received for brick and concrete construction.

Ottawa, Ont.
It is stated that the Ottawa Electric Railway has awarded a contract to Sanders Bros., of Ottawa, for building the car house in Ottawa. Cost estimated to be about $50,000. The company will also erect a freight house at Princeton and Spring Valley.

George Latham has been awarded the contract for the excavation and concrete work of Maple Leaf Milling Company warehouse. M. C. Edey, architect.

J. E. Wilson has applied for permission to erect a factory, and have a lumber yard in Ottawa South. The Board of Control is considering the application.

Mr. Jas. E. Wilson is applying for permission to place a sash and door factory on Riverdale avenue.

Mr. J. G. Kilt and Mr. F. Sugerman are planning to erect a business block, with apartments overhead, on the northeast corner of Catharine and Bank streets. The opposite corner has been purchased by a firm as a building site for a large factory to cost about $75,000, and will likely be of reinforced concrete and steel. Mr. Kilt effected the sale.

Portage la Prairie, Man.
The Equity Grain Bin Company, Winnipeg, will locate in this city and tenders for building will be called for shortly. Mr. Coleman, secretary, Board of Trade.

Princeton, Ont.
The Bank of Hamilton will rebuild their branch here. Mr. Forsayeth, manager of the Brantford branch, will consult with the bank's architects.

Penticton, B.C.
This municipality has now a building restriction by-law. All buildings constructed in the business section must be of brick or cement.

Quebec, Que.
The plans for the union station, which will be erected on the site of the Champlain market and which will accommodate

all the railroads running into Quebec, have been submitted by Mr. George E. Tanguay, architect, to Hon. S. N. Parent, chairman of the Transcontinental Railway.

Regina, Sask.

Tenders were called until Sept. 26th for erection of the Traders Bank here. Storey & VanEgmond, architects, Regina.

Sarnia, Ont.

The council have decided not to submit by-law to guarantee bonds of collar factory which has been negotiating in regard to locating here.

Saskatoon, Sask.

Robert Grey, president of the Gray Carriage Manufacturing Company, of Chatham, Ont., and Manson Campbell of the Manson Campbell Fanning Mill Company of the same city, are here to make arrangements for the building of a large distributing warehouse. It is understood that the warehouse will cost in the neighborhood of $50,000 and that branch offices will be established throughout the West.

Sydney, N.S.

The Dominion Iron & Steel Corporation have sent out specifications and are calling for tenders for construction of seven large buildings to be erected at their plant. These include: boiler house, machine shops, foundry, warehouse, oil house, carpenter shop, repair shop and finishing mill. The latter will cover an area equal to 400 feet square. Materials to be used, cement brick and structural steel. Hard pine will be used in the erection of finishing mill. New general offices may have to be erected owing to the expansion of the manufacturing departments.

Toronto, Ont.

Building permit has been issued to the Bank of Hamilton, for a three-storey stone and brick branch bank building, at 341 Bathurst street, to cost $6,000.

Victoria, B.C.

D. E. Smith, manager, Jordan River Lumber Company, Limited, has announced that his company will erect a sawmill in the early spring. The site has not been chosen yet.

A building permit has been applied for by Messrs. Moore & Whittington for their sash and door factory on the site of the old Adams' mill in the upper harbor.

A building permit was issued to P. Jeune for block of stores on north side of Pandora street, $11,600. H. S. Griffith, architect; Dinsdale & Malcolm, contractors.

Vancouver, B.C.

A building permit has been issued to Mr. A. F. McKinnon covering a brick block on Mount Pleasant, $20,000; also to Mr. J. McMillan for 3-storey warehouse on the corner of Smith and Beatty streets, $25,000; the B. C. Telephone Company has a building permit for the sub-station at Mount Pleasant, $50,000.

Woodstock, Ont.

Tenders will be received until Sept. 28 for erection of building for the Tobin Arms Manufacturing Company. Plans at office of the architect, B. McNichol.

Niagara Falls, Ont.

Tenders were received until Sept. 24th for all trades required in connection with erection of warehouse for the Marland Woolnough Wholesale Grocery Company. C. M. Porter, architect, Niagara Falls South.

Winnipeg, Man.

A new one-storey pump factory will be erected by W. H. Wortman on the south-west corner of Saskatchewan avenue and Dublin street, at a cost of $10,000. Matthews & Lemaistre are the architects, and W. Richmond is the contractor.

The W. J. Guest Company has secured a permit to erect a large warehouse on the south side of Alexander avenue, $16,400. The structure will be four storeys high, and will be built of stone, concrete and brick. Jams Chisholm & Son designed the building, and Messrs. Carter, Halls & Aldinger will erect it.

See "Power Plants."

Chas. Reid & Sons, paper box manufacturers, with factory in Hamilton, Ont., have bought all the property on the east side of Princess street between Henry and Logan avenues as a site for a large warehouse, of which the estimated cost is $300,000. The firm will take possession on March 1st, 1911, when work will commence. E. M. Counsel effected the sale.

Wynyard, Sask.

It is rumored that the Toronto Type Foundry Company will install a $10,000 plant here at once.

AWARDED

Fort William, Ont.

The board of health has awarded the contract for the plumbing of the new isolation hospital to Higginbottom & Company, and the contract for the heating plant of the new institution to Anderson & Company. The plumbing will cost $1,400 and the heating plant $835.

Montreal, Que.

The contract has been awarded W. Beverley Robinson, Montreal, for supplying "Carrara" (semi-glazed terra cotta) manufactured by the Royal Doulton Potteries, London, for the exterior and interior of the Canadian Pacific Railway Company's Place Viger station, Montreal.

Messrs. MacVicar & Heriot, architects, 104 Union avenue, have awarded the following contracts for certain additions and alterations to property at 102 Union avenue for J. C. A. Heriot, Esq., as follows: Masonry, brick and plastering, Gray & Wighton; carpentry, Wm. Evely; plumbing and heating, W. Graham; painting and glazing, R. E. Jones; roofing, Richardson-Simard Company.

The following contracts have been awarded in connection with the erection of the new factory building on St. Elizabeth du Portugal street, St. Henry Ward, for the National Acme Manufacturing Company, Montreal: Excavations, concrete, masonry, brick and carpentry, Griese & Walker; cut stone, John Quinlan & Company; lumber and millwork, R. McFarlane & Company, Limited, Shearer, Brown & Wills, Limited; brick, Lapraire Brick Company, Limited; supplies, Stinson-Reeb B. S Company; painting and glazing, J. N. Arcand; roofing, Richardson, Simard Company; plastering, Geo. H. Knott & Company. The heating, plumbing and electric wiring work will be let later and all information may be obtained from Mr. Walker at the Builders' Exchange, Montreal.

Three Rivers, Que.

The contract for the pulp mill of the Union Bag & Paper Company at Cap de la Magdaleine, has been awarded to Frank B. Gilbreth, Incorporated, No. 60 Broadway, New York. George F. Hardy, New York, is the engineer.

Winnipeg, Man.

The Canadian Northern Railway Company has let a contract to Carter-Halls-Aldinger, to construct offices, freight shed and a cold storage plant at the new Fort Garry terminals here. The contract price is $87,000. The combined dimensions of the three buildings, which are to be built together, are 664 by 60 feet. The offices are brick and stone, two storeys high. The cold storage plant will be faced with metal as will also be the freight sheds. The announcement that the freight yards are to be removed from Water street to the new terminals strengthens the local rumor that next spring will see a big hotel on the site of the present station and freight department.

The contract for erection of bakery and stables for Speirs-Parnell Baking Company has been awarded to Pattinson & Eilbeck, general contractors, at $60,000, 506 Furby street; Cotter Bros., Fort street, received the contract for plumbing and steam heating.

The contract has been let by the Manitoba Government Telephone Commission for the construction of the new telephone exchange known as the St. John's exchange, to be located on the northeast corner of Salter street and Burrows, to the firm of J. M. and J. J. Kelly. The contract amounts to $38,000, exclusive of the plumbing and ventilating systems. The building will be 75 by 63 feet, and two storeys high.

Power Plants, Electricity and Telephones

Berlin, Ont.

A meeting has been called by the Berlin Light Commission for Sept. 27th to organize a union to secure a supply of natural gas for the towns and cities in central Ontario.

Collingwood, Ont.

It is probable that a producer gas plant may be installed in the new power house for which materials are now on the ground.

Coquitlam, B.C.

At the regular monthly meeting of the Coquitlam council, held recently in the Municipal Hall, the Western Canada Power Company's by-law was finally revised and read a third time. This will be voted on by the people of the municipality on September 28.

Comox, B.C.

Engineers are now at work making surveys in connection with the project of the Canadian Collieries (Dunsmuir) Limited, for the development of 50,000 horse power on the Puntledge river in the centre of the Comox coal field. Within six weeks hundreds of men will be engaged in building a dam across the river and erecting a power plant. About a year will be occupied in completing the big undertaking. The proposed improvements will cost about $1,000,000.

Guelph, Ont.

The by-laws to take $85,000 preference stock in the People's Railway, and to grant a franchise for running rights over the city streets were carried by substantion majorities. Work will commence immediately.

Montreal, Que.

The Board of Control will recommend to the City Council the acceptance of the Montreal Light, Heat & Power Company's offer for street lighting. The contract is for a period of ten years.

This, if adopted by council, means the possible adoption of two new grades of arc lamps, one of which will cost $72,70 a year and is best adaptable to main lines.

(Continued on page 28)

Tenders and For Sale Department

Tenders Wanted

Separate or bulk tenders will be received by the undersigned sealed and marked "Tender for Town Hall," until SATURDAY, 22ND OCTOBER, at 4 o'clock p.m., for the erection of a Town Hall Building in the Town of Hanover.

Plans and specifications may be seen at my office, Hanover, and at the office of Forster & Clark, architects, Owen Sound.

The lowest or any tender not necessarily accepted.

JOHN TAYLOR, Town Clerk,
Municipality of Hanover.

September 12th, 1910. 39

Tenders Wanted

Separate or bulk tenders will be received by the undersigned, sealed, and marked "Tender for Public Library," until SATURDAY, 22ND OCTOBER, at 4 o'clock, p.m., for the erection of a Public Library Building in the Town of Hanover.

Plans and specifications may be seen at my office, Hanover, and at the office of W. E. Binning, arcihtect, Imperial Bank Building, Listowel.

Tenderers to state what allowance will be made for brick building now on the premises.

The lowest or any tender not necessarily accepted.

JOHN TAYLOR, Town Clerk,
Municipality of Hanover.

September 12th, 1910. 39

Tenders Wanted

Sealed tenders will be received by the undersigned up to 6 p.m. SEPTEMBER 30TH, 1910, for the construction and completion of the following sewers in the Town of Napanee: John street, total length, 1160 feet; Dundas street, 2,672 feet and 907 feet; Adelphi street, 941 feet; Bridge street, 891 feet.

Plans and specifications are filed and may be examined in the clerk's office. Tenders will be received for each portion separately or for all the sewers in lump sum. Lowest or any tender not necessarily accepted. Certified cheque for 10 per cent. of tender must accompany each tender.

W. A. GRANGE,
Town Clerk.

39

Dated Napanee, September 20th, 1910.

City of Moose Jaw,
Saskatchewan

Tenders

Tenders will be received by the undersigned up to 8.30 p.m. on MONDAY, OCTOBER 10TH, for supplying (for the use of the City Fire Department), one standard combination chemical and hose wagon with capacity 50 gallons chemical tank and 800 feet of 2½-inch fire hose, or 40 gallons chemical tank and 1,000 feet of 2½-inch fire hose. Wagon to be fitted to carry one 20-foot extension ladder on top.

Tenderers are asked ot quote prices for either 2½-inch steel or 2½-rubber tired Archibald wheels; also for one extra set of Archibald wheels, 1⅞-inch axle, 2½-inch steel or rubber [illegible]

Tenderers are asked to furnish detailed specifications and cut of wagon and equipment, and give price f.o.b. Moose Jaw.

The lowest or any tender not necessarily accepted.

W. F. HEAL,
City Clerk.

Moose Jaw, September 10th, 1910. 39

To Contractors

Sealed tenders, separate or bulk, will be received by the undersigned up to 12 o'clock noon on THURSDAY, 29TH INST., for the erection and completion of a Collegiate Institute Building in the Town of Smith's Falls, Ont. Plans and specifications may be seen at the office of the secretary-treasurer, Board of Education, Smith's Falls. A deposit of five per cent. must accompany each tender, or the names of two responsible persons who are willing to become sureties for the due performance of the above mentioned works.

The lowest or any tender not necessarily accepted.

DR. E. H. WICKWARE,
Chairman, Board of Education,
Smith's Falls, Ont.

39

Tenders

Church of Holy Angels
St. Thomas, Ont.

Tenders will be received by the Rev. T. West, St. Thomas, Ont., until 5 o'clock on SATURDAY, OCTOBER 1ST, for the Masonry and Plastering, Carpentry and Roofing, etc., required in the erection and completion of a stone church at St. Thomas, Ont.

Plans and specifications may be seen at the office of the undersigned and also at the Roman Catholic Presbytery, St. Thomas.

Security to the extent of one-third the amount of contract will be required for the faithful performance of the work.

The lowest or any tender not necessarily accepted.

ARTHUR W. HOLMES, Architect,
10 Bloor St. E., Toronto.

39

Tenders Wanted

Town of Barrie, Ont.

Sealed tenders addressed to the Town Clerk will be received up to noon of the FIRST DAY OF OCTOBER, 1910, for the construction of main street sewers. The work will be let in four sections and tenders received for one or more sections.

Contract A.—Clapperton Street. Approximately 2,077 feet, 10-inch pipe. 5manholes, 1 Flush Tank.

Contract B.—Small Street. Approximately 1,675 feet, 10-inch pipe, 3 manholes, 1 Flush Tank.

Contract C.—William Street. Approximately 713 feet, 8-inch pipe, 1 Manhole, 1 Flush Tank.

Contract D.—Bradford and Ross Street West. Approximately 1,738 feet, 12-inch pipe, and 746 feet, 8-inch pipe, 6 Manholes and 2 Flush Tanks.

Plans and specifications may be seen at the office of the Town Clerk, Barrie; at the office of the "Canadian Engineer," Toronto, and at the office of the engineer, Collingwood, after the 17th of September.

All tenders must be sealed and plainly marked as to the work tendered on. The lowest or any tender not necessarily accepted.

K. S. MACDONELL, Engineer.
THOS. BEECROFT, Barrie, Ont.

39

TOWN OF OSHAWA

Outfall Sewer Extension

Sealed tenders for providing and constructing a Main Trunk Sanitary Sewer as an extension of the present outfall sewer, will be received by the Town Engineer not later than 12 o'clock noon of FRIDAY, THE 14TH DAY OF OCTOBER, 1910.

The work includes the construction of:
1,800 feet Sewer, 20-inch diameter.
1,860 feet Sewer, 24-inch diameter.
12 Manholes and all appurtenances thereto.

Yardage of excavation is approximately 2,700 cubic yards.

Plans and specifications may be seen and forms of tender, on which application must be made, obtained at the office of the Town Engineer.

The lowest or any tender not necessarily accepted.

W. E. N. SINCLAIR, LL.B.
Mayor.

FRANK CHAPPELL,
Town Engineer.

Oshawa, Ont., Sept. 21, 1910. 39

CITY OF PORT ARTHUR

Debentures for Sale

Sealed tenders addressed to the undersigned and endorsed on envelope "Tender for Debentures" will be received up to 5o'clock p.m. of SATURDAY, OCTOBER 1ST, 1910, for the purchase of the following City of Port Arthur Debentures:

$30,000.00, July 1st, 1910, maturing 20 years, Telephone Equipment.

$171,765.00, July 1st, 1910, maturing 30 years, Construction of Sewers.

$127,775.00, July 1st, 1910, maturing 30 years, Extension of Waterworks.

$800.00, July 1st, 1910, maturing 10 years, Purchase of Ambulance.

$8,000.00, July 1st, 1910, maturing 20 years, Agricultural Society Grant for Buildings.

$10,000.00, July 1st, 1910, maturing 30 years, Electric Street Railway.

$6,000.00, July 1st, 1910, maturing 20 years, Y.M.C.A.

The preceding debentures bear interest at the rate of 5 per cent., payable July and January.

$12,000.00, Oct. 1st, 1910, maturing 30 years, Erection of new Car Barns.

$25,000.00, Oct. 1st, 1910, maturing 30 years, Laying Gas Mains.

$3,000.00, Oct. 1st, 1910, maturing 20 years, Purchase Land Extension of Reservoir.

$2,000.00, Oct. 1st, 1910, maturing 15 years, Grant for Swimming Pools.

The preceding debentures bear interest at the rate of 5 per cent., payable October and April.

$25,000.00, May 1st, 1910, maturing 30 years, North Ward School. Interest at 5 per cent., payable May and November.

The following annual instalment debenture payable in fifteen annual instalments:

$10,000.00, July 1st, 1910, Electric Lighting System.

Debentures and interest payable at Bank of Montreal Toronto.

Tenders will be received en bloc. Delivery at Port Arthur or otherwise to suit purchaser.

If debentures are delivered outside of Port Arthur, tenderer to pay exchange and insurance.

All tenders must cover accrued interest. Tenders will be considered in open Council at 8 o'clock, p.m., of Monday. October 3rd, 1910.

The highest or any tender not necessarily accepted.

Further information can be obtained from City Treasurer, W. J. Gurney.

J. McTEIGUE,
City Clerk.

Corporation Offices, Port Arthur,
September 17th, 1910. 39

Tenders for WATERWORKS PIPE

Tenders are asked for following cast iron water pipe: 2,000 lineal feet 6-inch and 2,900 feet of 14-inch cast iron water pipe, and specials for same; also 300 feet 14-inch flexible pipe for crossing canal. Address

BOARD OF WATER COMMISSIONERS
Welland, Ont.
39

City of Prince Albert

Tenders

Sealed tenders addressed to the undersigned and marked "Tender for Pumps," will be received until noon on FRIDAY, THE 30TH DAY OF SEPTEMBER, 1910, for the supplying and erection of two (2) Centrifugal, Electrically Driven, Automatic, Control Sewage Pumps.

Specifications may be secured from the City Engineer of the City of Prince Albert.

The lowest or any tender not necessarily accepted.

C. O. DAVIDSON,
City Clerk.

Dated at Prince Albert Sask., August 31st, 1910.
39

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

Friday, Sept. 30th at 11 a.m.

for

New School Building on Ossington Avenue

New School Building on Annette Street

Hollow Tile Flooring at Humberside Collegiate Institute.

Work Benches and Cabinet Work, etc. for four New Manual Training Centres

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH,
Chairman of Committee.
W. C. WILKINSON,
Secretary-Treasurer.

Toronto, Sept. 23, 1910.

To

Building Contractors

Tenders are invited for the erection in Newmarket, Ont., for a large four-storey factory building for the Office Specialty Mfg. Co.

Tenders in bulk or separately for concrete work, brick work, carpentry, painting, plastering, galvanized iron work and gravel roofing, will be received by the architect up to THURSDAY EVENING, OCTOBER [illegible]TH.

Lowest or any tender not necessarily accepted.

The plans and specifications may be seen at my office, Queen street, Newmarket, on and after Monday, October 2nd.

O. E. TENCH,
41 Architect.

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

ENGLISH ARCHITECT AND SURVEYOR of seven years' experience, will arrive in Toronto in October, and will be open to engagement as assistant. Age 25. References. Address "E. B. B.," care CONTRACT RECORD. 39

Business Buildings and Industrial Plants

(Continued from page 27)

ness thoroughfares. The second is the Standard B. light, at $63.15 per annum, which is suitable for residential streets. On this point, however, it is understood the city will maintain an option to select whichever light they please in any particular district.

St. Hyacinthe, Que.

Until Sept. 30th, tenders will be received for $60,000 4½ per cent. bonds for electric lighting purposes. D. T. Bouchard, city clerk.

Watrous, Sask.

The clerk was instructed by council to wire National Securities Company to frame an agreement for approval for the installation of an electric lighting system and for the proposed car line.

Winnipeg, Man.

Smith, Kerry & Chace are preparing plans for the central power sub-station, to be constructed on King street. The building will cost about $60,000 and the city will let the work this fall, completion being necessary by June of next year.

J. A. Fielding, C.E., of Toronto, and others have been in town prior to their departure for Grand Rapids, where they will investigate the possibility of obtaining electrical power there for the city of Edmonton. The party expect to be away about one month.

Tenders addressed to the Chairman, Board of Control, will be received until October 7th for manufacture and delivery of a motor car for use on standard gauge railway track. Specifications at office of power engineers, Smith, Kerry & Chace. M. Peterson, secretary.

Yorkton, Sask.

Tenders addressed to T. F. Acheson, secretary-treasurer, will be received until October 11th for apparatus for an electric light plant as follows: boilers, engines, piping, etc., generators, switchboards and arc lamps; transformers, motors. Specifications with W. E. Skinner, consulting engineer, Winnipeg, Man.

AWARDED

Medicine Hat, Alta.

D. Milne, mayor, writes that fifteen tenders were received for the supply of gas engines and generators for electric light and power plant here. Chapman & Walker, Toronto, were awarded the contract, supplying Crossley gas engines and generators at $25,000.

The following tenders for two direct connected gas engine driven 125 k.w. alternating current units for the power plant were received: E. Leonard & Sons, engines, $13,974, generators $11,100; Kilmer, Pullan & Burnham (1) engines $11,500, generators $8,776, (2) engines $17,500, generators $8,776; Siemens Bros., (1) engines $14,005, generators $4,255, (2) engines $17,500,. generators $4,255; Allis-Chalmers-Bullock, Limited, engines and generators $24,215; Canadian Westinghouse Company, engines $20,600, generators $5,690; Canadian Boving Company (1) engines, $14,500, generators $4,255, (2) engines $17,500, generators $4,255; Vandeleur & Nicholls, (1) engines $14,500, generators $3,050, (2) engines $17,500, generators $3,200; Gorman, Clancy, Grindley, generator $5,675; Canada Foundry Company, engine and generators $21,050; Canadian Fairbanks Company, engine $13,922, generators $5,903; National Meter Company, engines $13,495, generators $6,500; Turner, Fricke, Pittsburg, engines $16,706.80, generators, $7,851; Chapman, Walker Company, engines $17,060, generators $5,630; Drummond, McCall & Company, engines $13,500. M. A. Maxwell, consulting engineer to Medicine Hat.

Port Credit, Ont.

The Hydro-Electric Commission have awarded the contracts for the sub-station here to supply Brampton, Milton and other municipalities which have applied for power. The building will be erected by Stewart Bros., of Port Credit; the Allis-Chalmers-Bullock Company, of Montreal, will supply the transformers, and the switching equipment will be installed by the Canadian Westinghouse Company, of Hamilton.

Victoria, B.C.

The contract for the supply of 2,500 lbs. of copper wire required by the city was let to the firm of Drake & Hawkins at $18 per 100 pounds. That firm was the only one to submit a tender.

Miscellaneous

Hamilton, Ont.

The following building permits have been issued recently: Howard & Webber, brick stables in rear of 127 James street south, for J. W. Hammond, to cost $4,000; H. A. Keihl, brick dwelling, Barnesdale avenue, between King and Main street, to cost $2,000; Thos. Wren, brick dwelling, Barton street, $2,000; Carver & Phillips, brick store building, Francis street, corner Wentworth street, $2,500; Y.M.C.A., brick addition to building, Barton street and Milton avenue, $3,500.

Melfort, Sask.

Tenders addressed to A. McN. Stewart, secretary-treasurer, for purchase of $2,500 5 per cent. 20-year debentures will be received until October 15th; also until same date tenders for $1,700 5 per cent. 20-year debentures for local improvement.

Moose Jaw, Sask.

Tenders will be received until October 10th for supplying one standard combination chemical and hose wagon with capacity 50 gallons chemical tank and 800 feet of 2½-inch fire hose, or 40 gallons chemical tank and 1,000 feet of 2½-inch fire hose. Tenderers are asked to quote prices for either 2½-inch steel or 2½-inch rubber tired Archibald wheels; also for one extra set of Archibald wheels, 1¾-inch axle, 2½-inch steel or rubber tires. W. H. Heal, city clerk.

Montreal, Que.

Recent building permits include: The Imperial Tobacco Company, St. Antoine street, additions to factory building, $10,000; St. Denis School Commissioners, 92 [illegible] street, additions to property, [illegible] avenue and a three-storey school building on St. Andre street, [illegible]; C. A. Heriot, 104 Union avenue, alterations and additions to property [illegible] Union avenue, $8,000; J. B. Drapeau, 757 Marie Anne street, a two-storey residence on St. Hubert street, [illegible]; [illegible] street, [illegible] dwellings, on Rachel street, $4,000; J. & Z. St. Pierre, 592a St. Denis street, two houses containing twelve dwellings at 94 St. Mark street, $15,000; Children's Memorial Hospital, Cedar avenue, a one-storey addition to hospital building, $11,000; A. Deschamps, 1308 St. Hubert street, house containing three dwellings on St. Hubert street, $6,000; National Acme Manufacturing Company, 263 St. James street, a one-storey factory building, St. Elizabeth and Acorn streets, $22,000; St. Eusebe Parish, Fullum street, a presbytery building, cost $18,000; L. A. Jary, 3383 St. Hubert street, a two-storey house on St. Hubert street, $2,500; A. Charbonneau, 2141 Esplanade avenue, two houses containing five dwellings on Waverly St., $5,000; F. Pelletier, 220 Oufresne street, house containing three dwellings on Gauthier street, $3,000; C. Benard, 1228 St. Denis street, house containing three dwellings on Park avenue, $4,000; A. Brunet, 425 St. Antoine street, two houses containing six dwellings on Brewster avenue, $5,000; P. Larose, 35 Montana street, house containing five dwellings on Montana street, $6,000; F. Hottle, 1348 Boulevard St. Lawrence, house containing two dwellings and store on St. Lawrence Boulevard, cost $3,500; E. Laframboise, 563 De Gaspe street, house containing three dwellings on De Gaspe street, $3,000; O. Lefebvre, Mount Royal and Garnier streets, three houses containing six dwellings on Simard street, cost $4,800; H. Peladeau, 2238 Park avenue, house containing three dwellings on Park avenue, $4,500; J. Maisonneuve, 2202 St. Urbain street, house containing three dwellings on Waverly street, $5,000; B. McLennan, 50 Ontario avenue, a two-storey dwelling on Simpson avenue, $4,000; G. Martineau, 32 Villeneuve avenue, two houses containing six dwellings on Hutchison street, $8,000; P. Blanchard, 615 Mount Royal avenue, house containing two dwellings on Mount Royal avenue, $5,500; Mde. A. Hetu, 4631 Sherbrooke street, house containing two dwellings and two stores on St. George's street, $5,000.

Ottawa, Ont.

The delay in awarding contracts for the vessels of the new Canadian navy is because the plans are being revised by the Admiralty. To ensure secrecy all tenderers are sworn not to divulge any of the details of the plans.

Recent building permits include: James Oliver & Sons, Limited, brick veneer warehouse, Wellington street, $3,000, G. Cains, contractor; Maple Leaf Milling Company, Limited, ironclad and brick veneer warehouse, Broad street, $6,000; Wolf Shenkman, brick veneer dwelling, four in row, Nelson street, $6,000; R. F. Harris, frame dwelling, Holland avenue, $2,500; W. St. George, brick double house, Russel avenue, $3,000; E. A. Parsons, brick veneer dwelling and alterations, Ann street, $2,800; J. A. Lafontaine, dwelling, Clarence street, $3,000; O. Asselin, dwelling, St. Andrew street, $3,000.

Port Arthur, Ont.

Tenders will be received up to October 1st by J. McTeigue, city clerk, for the purchase of various debentures of the city of Port Arthur. For further particulars see "Tenders and For Sale Department" of this issue.

Toronto, Ont.

Recent building permits include: T. Wright, 2-storey brick dwelling, near Algonquin, on east side Indian road, $5,000; G. Buchanan, 2½-storey brick dwelling, near Bedford, on north side Chicora, $4,500; W. S. Grimshaw, 2-storey brick theatorium and dwelling, on 952 College street, $5,000; G. H. Webb, 2-storey and attic brick dwelling, near Wright avenue, on east side Indian road, $4,000; W. S. McLelland, 1 pair semi-detached 2½-storey brick dwellings and stores, northeast corner Don Mills road and John street, $7,000; F. Courtmanche, 4 detached 2-storey and attic brick dwellings, near College, on east side Keele street, $16,000; James Kyle, 2 detached 2½-storey brick dwellings on 25-27 Triller avenue, $7,000; T. E. Washington, 1 pair semi-detached 2-storey brick dwellings, near College, on west side St. Clarens, $4,400; R. Burkell, 1 pair semi-detached 2-storey brick dwellings, on 5-7 Sulley crescent, $4,000; Davis & Moore, 2-storey brick dwelling, on Schofield avenue, $5,000; H. M. King, 1 pair semi-detached 2½-storey brick dwellings, near Garden, on east side Glendale, $4,600; Wm. McRea, 2-storey and attic brick dwelling, near Bloor street, on west side Dalton, $4,500; G. Wallis, altering 1 pair dwellings to apartments, on 37-37 St. Vincent street, $5,000; A. A. T. Munnings, 2-storey brick store and dwelling, on 1052 Bloor street west, $4,500; Canada Metal Company, 1-storey brick addition to foundry, near Liberty street, on east side Fraser, $5,000.

Vancouver, B.C.

Building permits were granted recently as follows: Mrs. W. Sanford, 445 Dufferin street, $4,500; a two-storey brick building to be erected on Water street by Mr. E. Gould, $15,000; R. D. Cowan, frame building, 2052 Fifth avenue, $5.000; Chas. Helman, frame structure, $2,300, 1643 Third avenue east; R. J. Coleman, two frame buildings, $2,600 each; J. Burns, 1516 Charles street, $2,600; W. J. Jess, 1808 Sixth avenue east, $2,500.

Winnipeg, Man.

Tenders addressed to Chairman Board of Control will be received until Sept. 30 for supplies for fire department including: 5,000 feet of 2½-inch cotton rubber lined fire hose; 500 feet of 3½-inch cotton rubber lined fire hose; 30 non-interfering fire alarm boxes complete; 2 15-inch electro mechanical gongs; reserving water tower on running gear. M. Peterson, secretary.

Tenders addressed to C. W. Sharp, chairman Public Works Board, will be received until October 3rd for 5,000 lineal feet wire fencing, delivered and erected at Kildonan Park. Specifications at office of Public Works Board, 229 Chamber of Commerce building. J. H. Blackwood, secretary.

Recent building permits include: R. F. McLean, house, west side of St. Cross, $5,500; Alaska Bedding Company, additional storey on warehouse, northeast corner of Gomez and Point Douglas, $7,000; Henrietta Rosholt, house, west side of Ashburn, $2,500; German Lutheran church, southeast corner of McCalman and Grey, $7,000; G. W. Ford, house, north side of Harvard, between Guelph and Wilton, $8,000; J. Morocovits, house and store, Salter street, between Andrews and McGregor, $5,000; M. Milskolz, tenement, north side of Mountain, $2,200; T. L. Kerr, house, east side of Arlington, $2,500; D. James, house, north side of Alfred, between Aikins and Salter, $2,200; G. A. Boehn, house, east side of Pine, between Portage and Lawn, $2,000; West End Realty Company, two houses, west side of Ruby, $9,000; G. A. Boardman, house, west side Campbell, between Godfrey and Wellington crescent, $5,500; W. J. Parks, house, west side of Bannerman, between Andrews and McGregor, $2,000; D. Kirkerod, two houses, west side of Arlington, $6,000; Boyle-Higgins Company, house, south side Merrion between Nassau and Pembina, $3,000; Sprague Lumber Company, factory, Point Douglas avenue, $3,000; W. T. Carson, house, north side of Dorchester, between Stafford and Wentworth, $5,500; G. Wasilina, two houses, north side of Redwood, between McKenzie and McGregor, $2,000; A. O. Galbraith, dwelling, west side of Basswood place, $2,000; A. Simpson, dwelling, northeast corner of Home street and Buell avenue, $4,000; W. Hall, dwelling, south side of Elgin avenue, $2,000; P. McDiarmid, two dwellings, west side of Walnut street, between Buell and Wolseley avenues ,$7,000; J. Harrison, dwelling, south side of Kylemore avenue, between Nassau and John streets, $2,000.

New Companies

The British Empire Bridge Company, Limited, Montreal, Que., capital $5,000.000. Incorporators: Robert C. Smith and Frederick H. Markey, K.C., both of Montreal.

Conduit & Cable Company, Limited, Toronto, Ont.; capital $20,000. Incorporators; John F. MacGregor, accountant and Francis Walkingshaw, solicitor's clerk, Toronto.

The Dorchester Peat Company, Limited, London, Ont., capital $75,000. Incorporators: John McWilliam, physician, and John M. McEvoy, barrister-at-law, both of London.

The Modern Pressed Brick & Stone Company, Limited, Winnipeg, Man., capital $5,000, Incorporators: Anson E. Brown and Ephraim H. Fleming, contractors, both of Winnipeg.

Canadian Tube & Iron Company, Limited, Montreal, Que., capital $1,000,000. Incorporators: Geo. V. Cousins, barrister, and Samuel T. Mains, bookkeeper, both of Montreal.

The Urban and Rural Telephone Company, Limited, Bothwell, Ont., capital $4,000. Incroporators: George Mahler, manufacturer, and Wm. R. Hickey, solicitor, both of Bothwell.

Canadian Patent Scaffolding Company, Limited, Toronto, Ont., capital $40,000. Incorporators: James E. Day, John M. Ferguson and Edward V. O'Sullivan, solicitors, all of Toronto.

The Canadian Box & Barrel Company, Limited, Pembroke, Ont., capital $100,000. Incorporators: John C. L. White, barrister-at-law, and Finlay Watt, lumberman's agent, both of Pembroke.

British Columbia Portland Cement Company, Limited, Princeton, B.C., capital $500,000. Incorporators: Robert P. McLennan, merchant, and James A. Harvey, barrister-at-law, Vancouver, B.C.

Canadian Dredging Company, Limited, Midland, Ont., capital $750,000. Incorporators, David S. Pratt, lumber merchant; Frederick W. Grant, barrister-at-law, and Hercule J. Craig, banker, all of Midland.

Lickleys, Limited, Toronto, Ont., capital $100,000. Incorporated to acquire and otherwise deal in timber limits, sawmills, etc. Incorporators: Hugh M. Lickley, manufacturer, and Arthur G. Randall, manager, both of Toronto.

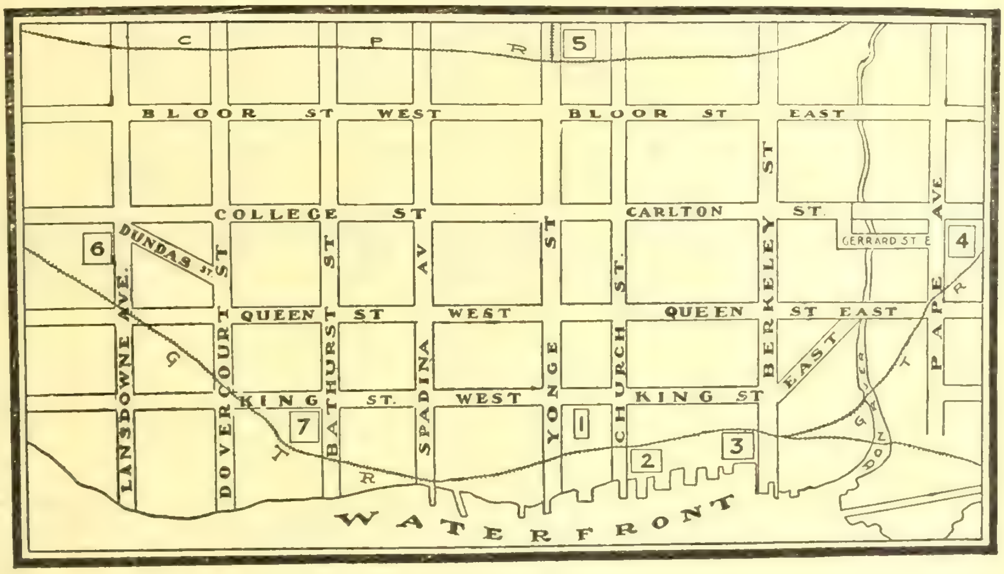
Vulcan Tube Cleaning Systems, Limited, Montreal, Que., capital $149,000. Incorporated to manufacture, deal in, etc., appliance for cleaning boilers, boiler flues, etc. Incorporators: Albert G. B. Claxton, K.C., and Thos. R. Kerr, advocate, both of Montreal.

It is stated that the Booth Copper Company, of Toronto, Limited, have been succeeded by Booth, Coulter Copper & Brass Company, Limited.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5



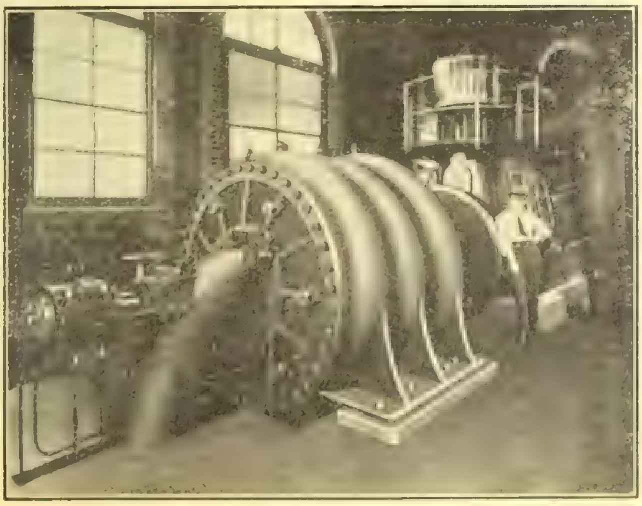
No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is

PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WATERWORKS PUMPING PLANTS



EFFICIENT AND ECONOMICAL

THE ILLUSTRATION SHOWS ONE OF OUR WORTHINGTON TURBINE PUMPS DRIVEN BY A 750 H.P. TRIPLE EXPANSION ENGINE IN THE LOW LEVEL STATION OF THE MONTREAL WATERWORKS. IT HAS A CAPACITY OF 12,000,000 GALLONS DAILY AGAINST A HEAD OF 205 FEET.

OVER 80 PER CENT. OF THE TURBINE PUMPS IN CANADA HAVE BEEN BUILT BY US FROM THE DESIGNS AND UNDER THE SUPERVISION OF OUR CONSULTING ENGINEER MR. W. C. BROWN, FORMERLY CHIEF ENGINEER FOR HENRY R. WORTHINGTON, NEW YORK.

WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
Limited

Portable Crushing Plants

including Elevators, Screens, Engines, Boilers, Etc.

Head Offices and Warehouses :
Montreal

MUSSEN

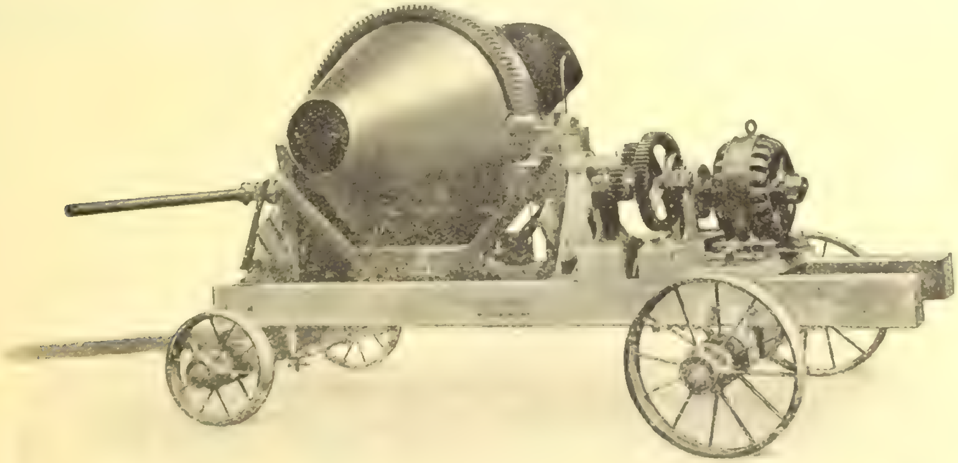
The Smith Concrete Mixer

always the leading mixer, is to-day further in advance of its competitors than ever before. Contractors now realize that thorough mixing, large capacity and reliability are the main points to be desired.

e

th

n all



Smith Mixer on Truck with Electric Motor.

We furnish them in all sizes and any style of mounting.

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co. Limited
Hamilton - Canada

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
R. F. HILL, J. R. HOOPER, Representatives
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto September 28, 1910 No. 39

The Engineer as Sole Arbitrator

According to Webster, a specification is "a written statement containing a minute description or enumeration of particulars." We know it as the written document in which engineers and architects describe those portions of proposed work which they cannot show clearly by diagrams; wherein further, they are expected to specify the material and quantities required, and, with this, the manner of carrying out the work.

How many specifications drafted by engineers come up to these requirements? Frequently, according to some contracting concerns, they are not worth the paper they are written upon, being so one-sided that they could not stand in a court of law, and so unreasonable that even the engineer himself would not think of requiring the "pound of flesh" which might be exacted under the letter of the law.

The specification should be both definite and exact. Then the engineer not only fully understands what he requires, but where, in addition, he expects to enforce its carrying out. Some engineers fancy that they are able to shield themselves behind a host of unreasonable clauses should a mistake be made. The client must pay for these unreasonable requirements, and the engineer who inserts them places himself in an unfavorable light before the contractors—the men who do the work and are in a position to judge of the necessity of each clause.

Such a clause as "All works are to be done to the entire satisfaction of the engineer" causes considerable dissatisfaction. He is to be the sole judge of the work and material, and his decision, only, on all questions of dispute as to the meaning or interpretation of plans and specifications is to be considered final and binding on all parties. Why the engineer who prepares specifications, and who is a client's representative, shall be the sole arbitrator in matters of dispute between himself and the contractor it is difficult to understand.

The engineer requires certain work to be done. The contractor, for a price, is willing to do the work. They both are agreed with the drawings and specifications covering the work required. It is unreasonable to expect the contractor to be content with the engineer as sole referee. It is doubtful if such a clause would hold in a court of law, and we cannot understand why engineers persist in inserting such clauses in the specifications. Such a clause as this places the men who make the drawings, prepare the specifications and contracts and issue the progress estimates, the arbitrator in matters of dispute. Is this fair to either the engineer of the contractor? It cannot be, since no contractor has any idea of abiding by this stipulation, should dispute arise.

This clause undoubtedly keeps a number of contractors from tendering on work where they are not personally acquainted with the engineer. It reduces the number of tenders considerably, and places the work practically in the hands of the friends of the engineer, which is not good business. The wording of specifications and the preparation of drawings and designs for the purpose of securing what is required should be in such a way as to place all contractors upon the same footing. Nor should the clauses be so stringent as to eliminate competition.

Basis for Contract Estimates

Specifications accompanying recent invitations to bid on a rather large piece of railroad construction in the East contained a clause stating that the railroad company would afford contractors "Every facility to make an examination of the ground, dig test pits, make borings, etc." Under the clause relating to piling was a provision that piles would be paid for at a price per linear foot for the length in the ground after being cut off, and a further provision that the length of the piles to be provided would be ascertained by driving test piles at the contractor's expense. The rest of the information shown on the profiles was of the most meagre description. There was no indication of the nature of the materials in the cuts or foundations, and there had evidently been little attempt to carefully distribute the quantities although the work averaged over 60,000 cubic yards per mile.

It is surely time for us to abandon this kind of contract. Most of the big railroad systems of the West long ago realized that the fullest information should be obtained and made available before asking contractors to bid, not only because the low prices thus obtained more than balanced the extra cost of getting the information, but also because they have learned that a proper location cannot be determined until the fullest information is obtained, particularly information regarding the character of the material to be moved. One of the most important factors governing final location is the distribution of the quantities, and this in turn involves an estimate of the behavior of the materials in the cuttings when placed in the embankments, whether they will swell or shrink, and how much. Of course this must be an estimate, in any event, based on the experience of the engineer, but his judgment should be, and certainly is, better, if it is based on such knowledge of the materials as may be obtained from a reasonable investigation of sub-surface conditions than if simply resting on observation of the surface only. When it is recalled that rock excavation, if entirely unmixed with earth, will sometimes swell nearly 100 per cent., that is, one yard in place will make two in an embankment, that the percentage of swell varies from this to nothing, that many kinds of materials shrink, and that embankments often compress the soil on which they are built or force it out of place, it will be seen that an investigation of the materials is absolutely necessary for a reasonable determination of the distribution.

Most locating engineers realize the necessity of such investigations, and the large railroad systems of the country, especially in the West, as before stated, acknowledge the economy resulting from them, but nevertheless the specific instance of a contrary course, noted above, which recently happened, is only one of many where the contractor is asked to gamble, for, of course, no contractor is going to the expense of digging test pits or making borings for the benefit of the railroad company. The cost of piling must necessarily be increased by the cost of driving test piles all over the country before the piles are ordered, not only increasing the cost but thus necessarily delaying starting work on the foundations of bridge abutments, culverts, and the like, which are always wanted before they are ready.

The lack of this information is generally due to parsimony on the part of the management of the railroad, but the engineer in charge is always blamed for the trouble that ensues. When he finds after construction has started that his quantities are not going to balance, he has to rush around making frantic attempts to change the line to overcome the difficulty, or, if he is not conscientious he makes sure that he has plenty of material in his cuts and then widens his banks carefully, if he has to, so that no one is the wiser and 15 to 20 per cent. more excavation has to be paid for than might have been necessary.

On ordinary single track railroad work running about 20,000 cubic yards per mile, a saving of 1,000 or 2,000 cubic yards of rock per mile, which can very readily be made by careful work, and often a great deal more, will pay for considerable engineering investigation, besides avoiding complications and disputes; and on work involving 60,000 yards per mile it can readily be seen that the possibilities are large. It is conceded, of course, that minute exactness in railroad location or in the distribution of quantities is by no means necessary, even if it were possible, but every effort should be made to obtain reasonable information and to obtain from the management time and men enough to make adequate studies of its effect upon the location. This matter is by no means new, but the importance of the work referred to, at the outset of these comments and of the railroad of which the line is an addition, seems to indicate that someone in a pretty influential position is as yet not sufficiently educated to the importance of spending a small sum to save a large one.—Engineering Record.

The first section of the Kent and Queen street, Ottawa, 48-inch circular brick, 24-inch and 15-inch tile pipe sewers was completed last season. Actual rock levels showed much more rock than was estimated and in places running sand was found at the proposed line of grade. The Ingersoll Sergeant steam drill was used continuously on this work with steam supplied from the boiler of the traveller. The brickwork was constructed to the centre of Queen street. From this point in an easterly direction to the centre of Bank street, 24-inch tile pipe was laid which was reduced to 15-inch, and carried to 115 feet east of east building line of Bank street. An overflow 15-inch pipe diameter was built leading from the existing brick sewer on Bank street into the new 24-inch Queen street sewer and had the effect of relieving the flow of storm water.

The City Engineer's Estimate

Some Hard Facts as Presented by a Toronto Contractor—Is the System Right or Wrong?

Toronto, Sept. 17th, 1910.

Editor "Contract Record":—

I have read with interest your article on page 35 of the September 14th issue of the "Contract Record" and also Mr. Curtis' letter on page 36 of the same number, and agree with both, that the system of day labor as practised in Toronto (and also, apparently, in many other municipalities) and the principle of having the engineer tender for work against the contractor is unfair both to the contractor who makes the bid and the property owner who has to foot the bill.

The fact of the matter is this: the engineer puts a foreman on the work with no inspector over him, and the man can scamp the work as he likes, both in material and faulty labor. This new practice is vicious and dangerous, and it will be more so, if allowed to develop. The system gives the aldermen patronage, and the officials lots of room to work out increased salary by telling the public of the saving they have been able to make by doing the work by day labor; when, as a matter of fact if the contractor had been given the same latitude, he would probably have done the work better and more economically

There are many circumstances and opportunities favoring the engineer. He can use what he likes and do as he likes, whereas the contractor has to pay for all the material he gets and put it into the work, under the supervision of one or more inspectors. Contractors are compelled to live rigidly to the engineers' specifications. One may judge whether the engineer's foreman on a work with no inspector will not try his best to make the job pay, even if portions have to be somewhat scamped.

It is time property owners took more interest in these matters and it behoves all contractors to hold out the danger signal. The system under discussion is a menace to private enterprise and capital, and its influence is most insidious and widespreading, as is shown in your article and in Mr. Curtis' letter.

Yours truly,

A. W. GODSON, TORONTO.

A Similar Plaint from Winnipeg

R. W., of Winnipeg, informs us that some 18 months ago, tenders were called for paving construction on Main Street and Colony Street East. He states that the work was let to the construction engineer at a price that no one else could approach; further, that the work has not been carried out yet, although the contractors' deposits on these jobs were not returned for a month. R. W. is pessimistic enough to express the opinion that conditions in this direction are getting worse.

The subject was discussed in a general manner by the Winnipeg Board of Control last week. As a result of this discussion the city engineer's department was notified that in future vigorous inspection would be made of its work. The question of outside supervision brought up some points relative to work by the engineer of construction, and it was found that he was often allowed some liberties in reading specifications. The board agreed that this should not be permitted, and a strict supervision of his work will be conducted.

Reinforced Concrete Arch Bridge of 70 ft. Span at Kirkham's Mills, Township of Scarboro', Ont.

Reinforced Concrete Arch Bridge, Scarboro', Ont.

The reinforced concrete arch bridge shown in the accompanying illustration, was opened to traffic on Monday, September 12th, 1910, in the presence of the council of the township of Scarboro, Ont. It has a clear span of 70 feet; the height of roadway above water is 20 feet and the roadway is 16 feet in clear width. For the north abutment the foundation rests upon well-compacted gravel while at the south abutment the material was hard clay. Especial care was taken to prevent cracking of the spandrels and railing by inserting expansion joints over the springings and at points in the railing approximately over the third points of the arch ring. The asphalt in these joints was prevented from running out at points where lap joints could not be provided by calking with rope. All reinforcement was of plain round steel bars except expanded metal in the railing.

The total amount of concrete in the bridge was about 425 cubic yards. The cost, including engineering and inspection, was about $5,900.

The engineers for the work were Messrs. Barber & Young, Toronto, and the contractors, Messrs. Rutherford & Patten, St. Catharines, Ont.

Tensile Tests of the Bond of Cement Mortars

The strength of the bond between layers of mortar deposited after different time intervals has been investigated by tensile tests by Prof. B. Kirsch, of Vienna, and because the method has proved satisfactory it was described by him in a paper presented to the Copenhagen Congress of the Intercolonial Association for Testing Materials. The specimens resemble roughly in shape the ordinary tensile test specimen, the joint being at the smallest section, which has an area of 100 x 200 mm. The moulds were of wood, lined with zinc to prevent absorption of water by the wood, and when the first half of the specimen was moulded the other half of the mould was closed with a removable filler block.

Two mixtures of Portland cement were experimented with, a 1:2 and a 1:4 mortar. The intervals of rest between pouring the two layers in contact were 0, ½, 2, 6 and 14 hours, corresponding to uninterrupted work, work interrupted by short intervals as by the dinner hour, and by half and finally a full day or night. The charge was pressed into the mould with a pestle, but not rammed. The 1:2 mixtures were taken from the moulds after two or three days, the 1:4 mixtures after eight days. After completion the specimens were allowed to harden for three months in a damp cellar.

The Portland cement used showed a tensile strength in neat tests of 269 pounds per square inch after one week, and 346 pounds after four weeks. It was of constant volume, took initial set in 4½ hours and hard set in 15 hours. A quartz sand was used.

The adhesion values found are given in the follownig table in pounds per square inch:

Interval in hours	0	½	2	6	14
1:2 mortar	54	17½	20½	15	14½
1:4 mortar	56½	17	16	22½	17

From these and further tests Prof. Kirsch concludes that an interval of half an hour is sufficient to reduce the adhesion strength to about one-third of the concrete strength, and that with longer intervals the adhesion diminishes still further but more slowly than during the first half hour.

Toronto Filtration Plant

Attention is directed to the description of the above work appearing on the following pages. It is of interest to note that Mr. Allen Hazen, of New York, the city's consulting engineer, came out strongly in favor of the contractors upon the occasion of his visit to the city last Saturday. Mr. Hazen held a consultation with City Engineer Rust, Mr. H. L. Drayton, K.C., Corporation Counsel, and other officials regarding the progress of the work. He stated that, having regard to the difficulty experienced by the contractors in securing men they have done remarkably well. In his opinion the work might be continued throughout the greater part of the winter. It might cost a little more for labor, but that was an obstacle that should be overcome.

During 1909 a tar macadam pavement was laid on Waverly street, Ottawa, from Elgin street to Metcalfe street, the full width of the roadway between the concrete sidewalks. This was of the usual construction, 8 to 10 inches of spalls for the foundation, a 3-inch layer of 2-inch broken stone, a 3-inch layer of 2-inch tarred limestone and a top coat of 1-inch thick of ⅝-inch tarred limestone. The existing concrete sidewalk on the north side with the exception of about 130 feet, at the west end, was lifted and relaid in line with the west end. The cost of this tar macadam pavement, 1,[illegible] square yards, laid by day labor, exclusive of [illegible] was $1.88 per square yard.

Progress on the Toronto Filtration Plant

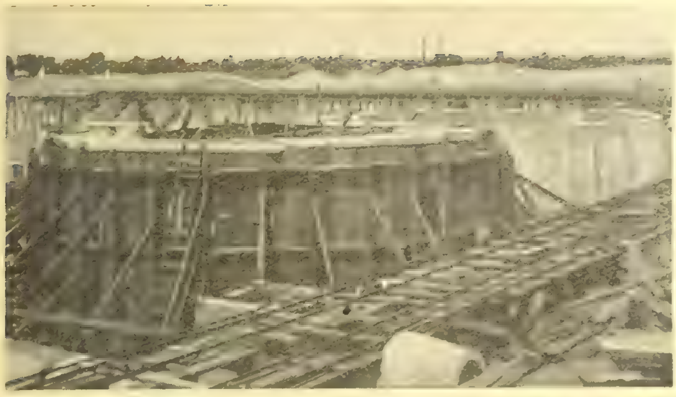
Timely Description of the Details and Methods of this Work—Summary of Amount Completed—Fourth Article of Special Series

During the last few weeks a good deal of gratuitous criticism has been handed out from various quarters at Toronto concerning the alleged unsatisfactory rate of progress on the filtration plant under construction in that city. The subject has been discussed at much length by the civic authorities and by the press, and a number of suggestions have been made. One source of protest is the Local Council of Women, who wrote to Mayor Geary calling attention to the prevalence of typhoid fever in the city and calling upon the council to hasten the construction of the filtration plant at the Island. An idea of the extent to which the ladies are alarmed may be gathered from their claim that the delay on the work is likely to cause the loss of 100 lives or more. We do not hold any brief for the contractors, Messrs. Dill, Russell & Chambers, but we venture to think that if the Local Council of Women in common with the statisticians who computed the figures have not an exaggerated sense of the seriousness of the situation they certainly have underestimated the detail in the construction of this plant, the trouble caused by the scarcity of labor and the amount of work that has actually been accomplished.

1—Floor of Filters Showing Main Drain for Collecting Filtered Water

While we do not propose to discuss at any length the several suggestions that have emanated from the Board of Control and elsewhere, we cannot refrain from criticizing the proposal to augment the supply of labor at the filtration works by offering an increased rate of wage for unskilled labor. The minimum rate required to be paid on city contracts is 18 cents per hour, but the actual rate varies from 20 to 25 cents per hour. What would happen if Messrs. Dill, Russell & Chambers offered an inducement of a minimum rate of 25 cents an hour, as suggested by one of the city controllers, is no difficult matter to foretell. At first there would be a general rush for the filtration plant, and the various other contracts under construction in the city, such, for instance, as the trunk sewer work, would be practically at a standstill. There are four or five hundred men engaged on the last named work, and if half of these were to throw up their jobs it would disorganize the whole department. Then the other contractors, in order to complete their contracts, would at once meet the increased rate, the men would return to their original positions and the conditions would remain unaltered, the net result being simply an increased rate of wages to all laborers in the city without having accomplished the end in view. Such a

2—General View of Filters Showing Covered Main Drain and Concrete Piers

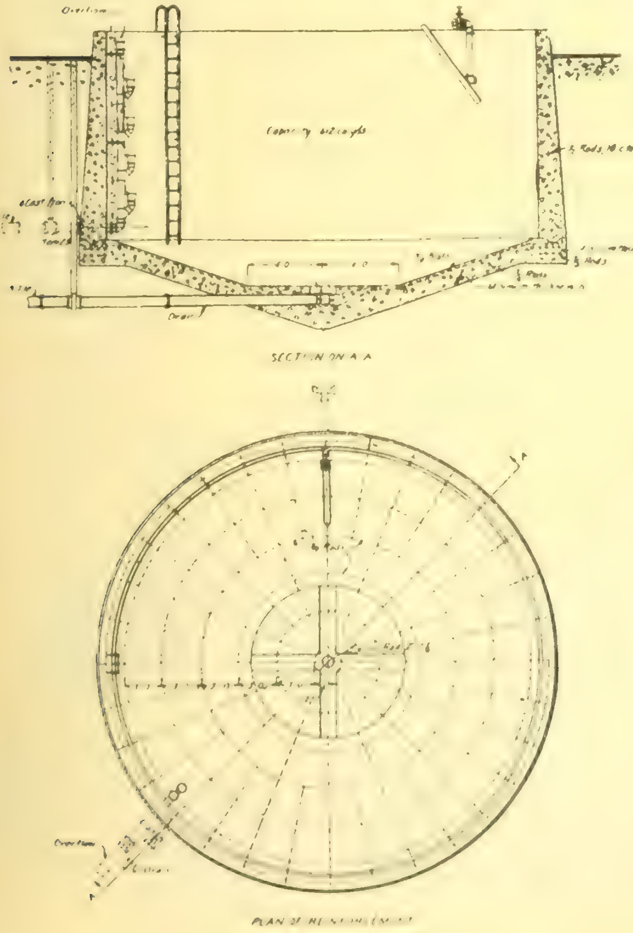


3—Bins for Storing Washed Sand for Filters

step would establish a bad precedent and one that would be hard to live down in contracting circles.

In one respect at least the work accomplished has called forth general commendation from visiting engineers and contractors, and that is in regard to quality. Upon a recent visit to the scene of operations, the city's consulting engineer expressed the opinion that if the quantity of the work done equalled the quality there could be nothing else desired.

A description of what is going on at the works, an account of the methods by which the construction is being carried on and a summary of what has been accomplished this season will be timely at this juncture. The article will be of additional interest if reference be made to previous numbers of this journal in which the earlier stages of the work were described.



3A—Constructional Details of Storage Bins

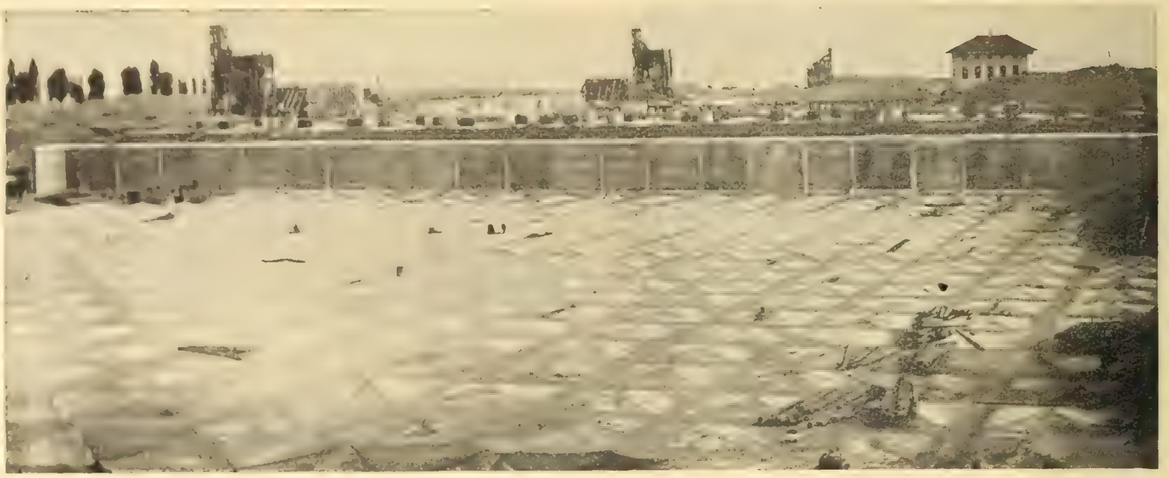
4—End and Division Walls of Filters, Foundation for Entrance Building and Raw Water Inlet to Filters

In the third article of this series, published May 4th, details were given of the winter work and of the preparations made by the contractors with a view to facilitating construction during the summer and fall. At the opening of the season everything was in excellent shape for the expeditious handling of the contract. The contractors had planned the layout of their extensive plant and had erected a large screening plant on the lake shore. Also a system of tramway lines had been installed for the transportation of materials to the screens and storage bins, and from these to the concrete mixers. A comparison of the present views with those published on May 4th will give some idea of what has been accomplished in something less than five months.

Since that date the excavation for the west half of the filters, the pure water reservoir and a portion of the east half of the filters has been carried out, also the remainder of the various pipe lines. The pumping station and the two regulator houses have been completed. The construction of the four large sand bins, which are to be used for the storage of washed sand for the filters, has been carried out. In addition to the above, and to a multitude of minor detail in the construction of manholes, catch basins and other items incidental to the work, there have been completed practically all the floors for the west half of the filters, the concrete piers and walls for three complete filters, the groined arch roof for two filters, the concrete floor and the greater portion of the walls for the pure water reservoir.

As may be gathered from a preceding paragraph, the contractors, at the beginning of the season, installed a

5—36-inch Main Drain and 72-inch Raw Water Pipe at Site of Venturi Meter



6—Concrete Floor of Pure Water Resevoir, Area 2¼ Acres

plant which, in their opinion at that time, would be sufficient for the requirements of the contract during the present year, but the scarcity of labor which has been experienced all over Canada in every department of constructional enterprise greatly hampered their operations with the result that a portion of the plant has been idle for practically the whole season. A force of upwards of 300 men has been constantly employed during the present season. The accompanying illustrations indicate in a measure what has been accomplished.

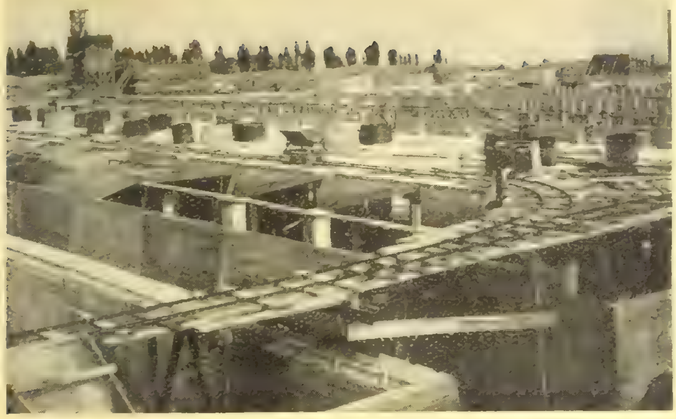
The first picture is a general view of the floors of filters, showing the detail of the main collecting drain for the filtered water. This main drain is built of concrete and is about six feet in width. Ten-inch split tile are built into the sides of this drain at intervals of 13 feet. This tile will be extended in parallel rows from the main drain to the division walls and will collect the filtered water, which will be gathered into the main drain and be carried through a 24-inch cast iron pipe to one of the regulator houses. From there it will pass into the pure water reservoir, and thence to the city pumping station. The main drain extends the whole length of each filter and is 312 feet long, the size of each filter being 312 by 117 feet. The forms shown on the concrete floor are for the piers which support the concrete roof.

In the second illustration, which shows the construction at a later date, the main drain is covered with reinforced concrete slabs. The only entrance into this drain is through the 10-inch split tile drains which collect the filtered water. As will be seen, the piers have been erected and the forms stripped off. The contractors are to be congratulated upon the accuracy of the alignment of these piers and the neat appearance of the work.

For the operation of the filters it will be necessary to have a supply of washed sand in stock for the renewal of the surface material for the filters. For this purpose four circular storage bins have been constructed (see illustration No. 3). Each of these bins has a capacity of 612 cubic yards, the inside diameter of each being 34 feet and the depth about 21 feet. The thickness of the concrete floor and walls, and the arrangement of the steel bar reinforcing, also details of the piping system are shown in 3a. These bins are of the best type of reinforced concrete construction and present a very uniform appearance. The tracks and endless cable seen in this picture show the contractors' method of handling the various concrete materials from the screening plant on the lake shore to the mixer plants on the work

The fourth view shows the outside wall of the filters and the division wall between the two adjacent filters.

7—The First Forms Erected for Groined Arch Concrete Roof Over Filters

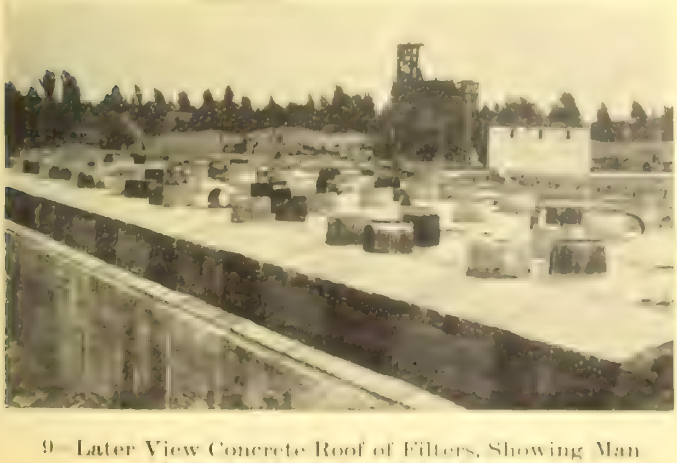


8—Outside Walls of Pure Water Reservoir and Filters, and Starting of Concrete Roof

At the junction of these walls there has been erected a small building known as an entrance house, through the foundations of which the raw water pipe, shown clearly in the photo, brings the unfiltered water to the filters. The supply is regulated by large gate valves through which the water is supplied. There will be six of these entrance buildings, three on each side of the central court. Each will provide for the supply of raw water to two filters

In the fifth picture will be seen the concrete pipe lines where they cross the drainage canal near the pumping station. The upper one is the 72-inch raw water pipe, through which the unfiltered water is carried from the pumping station to the filters. The end shown and a section near the pumping station have since been connected by a large Venturi meter, 50 feet in length. The peculiar construction of this meter consists in the sudden narrowing down of the diameter of the pipe from 72 inches to 36 inches and the gradual enlarging in a long funnel to the larger diameter. Cast iron rings with small pipes attached have been set into this pipe at such points as to permit the accurate measuring of the flow of water through the meter by means of a system of gauge tubes. Variations of pressure in these indicate changes in the quantity of water flowing through the pipe. Thus an accurate computation of the amount of water being filtered can be made daily.

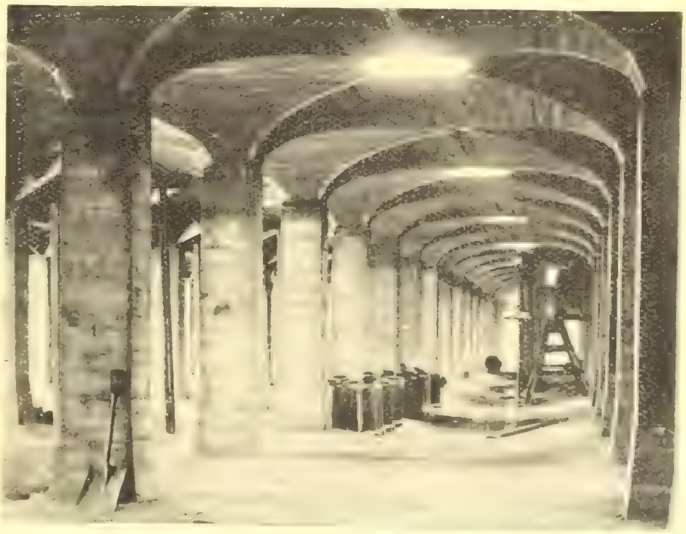
The lower pipe, seen in No. 5, is the 36-inch main drain which extends clear round to the extreme end of the plant. Into this drain are connected the smaller drains from the pure water reservoir, filters, regulator houses and various catch basins, thus enabling the drainage of any desired portion of the filtration plant. This main drain empties into a sump in the pumping station. At this point will be placed a pump to elevate the drainage so that it can be forced out into a lagoon to the west of the pumping station.



9—Later View Concrete Roof of Filters, Showing Man holes and Steel Forms for Same

The concrete floor of the pure water reservoir is shown in the sixth photo. Here a quantity of filtered water will be stored before passing into the steel pipe line and the tunnel leading to the city pumping station. This reservoir is 312 feet square, covering an area of 2¼ acres. It is surrounded with heavy concrete walls and will be roofed over after the same manner as the filters. The amount of concrete in this floor is a little over 2,500 cubic yards. The roof will be supported by 529 concrete piers.

In the seventh view there is illustrated the type of form used in the construction of the groined arch roof. This roof is put up in sections 13 feet square. The thickness of the concrete over the supporting pier is 16 inches, gradually tapering down by parallel elliptical surfaces to 6 inches in thickness at the flat top. Each section is drained by 2-inch agricultural tile pipe, set slanting over each pier. An immense number of forms are required in the construction of this roof work. About one-third of the number are shown in the picture. The photo also shows the tracks used by the contractors for the economical handling of the concrete from the mixer plant in filling the walls surrounding the filters and also the roof forms.



10—Interior of Filters, Showing Piers and Groined Arch Roof

The eighth illustration, taken at a later date than the preceding picture, shows sections of the concrete roof completed and the concrete manholes which are spaced at regular intervals over the surface of the filters for the purpose of ventilation and the convenient handling of material in and out of the filters. Over two feet of earth will be spread on the top of this concrete roof. This in time will be sodded to form a large park. The only evidence of the existence of a plant, outside of the buildings and operating devices, will be the manhole tops in regular rows. This photo shows also the type of form used in connecting the concrete squares over the top of each pier with the side walls. It also shows the method of supporting the forms from underneath. It will be noticed that the track for handling the concrete has been thrown over onto the finished roof. This method has been followed up generally as the work has advanced and has facilitated the economical handling of the material. The four large sand bins described pre-

[illegible] will be seen over the top of the end walls in the distant part of the picture, also the form work for the two regulator houses.

A later view of the roof of the filters, No. 9, shows clearly the connection of the walls with the roof. On the right hand in the background will be seen the completed concrete wall of one of the regulator houses.

An excellent interior view of the filter, after the placing of the concrete roof and the removal of forms, is shown in the last picture. The design of the roof is well illustrated by the graceful elliptical curves of the groined arch. The perspective view is particularly pleasing. Here again is a further evidence of the excellent workmanship that has been characteristic so far of the whole contract. The results shown in illustration No. 10 are a proof of the accurate placing of the piers and the uniformity of the form work for the roof. The clean even surface of the concrete and the general appearance of the work are an object lesson in this class of construction.

Approximately one-half of the value of the contract has been completed up to the present date. It is hoped to prosecute operations during the winter months with a view to completing the whole work about the middle of next season. Practically all of the detail and smaller work have been finished and from now on the developments will be of the kind that will appeal to the non-technical critic of municipal construction. In the remaining portions of the contract much better results may be expected. The work will consist in the completion of a considerable amount of concrete construction, the preparation of the filter gravel and sand required in the operation of the plant, and the refilling about the filters and pure water reservoir, necessary for the protection of the plant from extremes of weather and to give the work a finished appearance.

Power Development in Northern Ontario

Interesting Constructional Features of Installations at and around Cobalt—Cobalt Hydraulic Company's Novel Application of Hydraulic Compressed Air System

Cobalt is strikingly abreast of the times in the possession and general use of electric light and power. The four examples which stand out prominently in the Cobalt region are: (1) an up-to-date interurban electric railway, the Nipissing Central; (2) the hydro-electric development of the Beach Brothers, some six miles from Cobalt town at Hound Chutes on the Montreal river, operating under the name of the Cobalt Power Company (described in last issue of the "Contract Record); (3) a hydraulic compressed air system, operated by the Cobalt Hydraulic Company and situated on the Montreal river, a little lower down, at Ragged Chutes; and (4) the hydro-electric development near the mouth of the Montreal river, but situated on the Matabitchouan, a smaller river, emptying into Lake Temiskaming at practically the same point on the Montreal river. This latter is known as the Mines' Power Company.

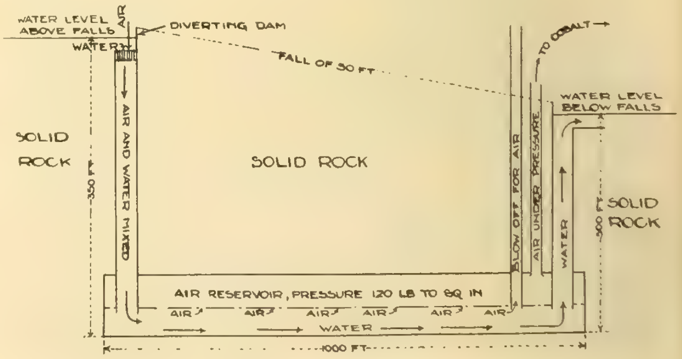
1—Metal Tube Conducting Compressed Air Eleven Miles under 120 Pounds Pressure

The Cobalt Hydraulic Company

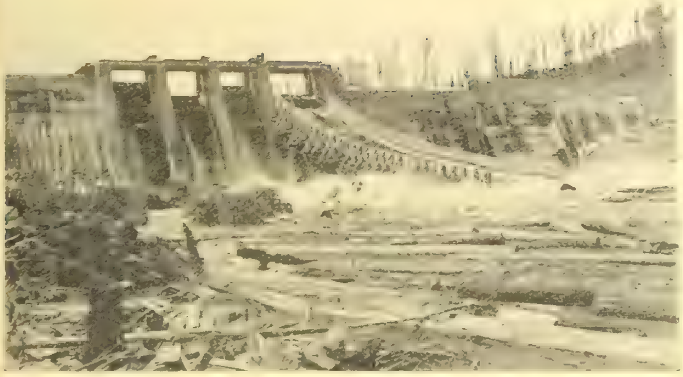
The Cobalt Hydraulic Company's plant transmits compressed air from Ragged Chutes to Cobalt town and district, a distance of about eleven miles. The air is carried in a metal tube, a view of which is shown in fig. 1. This tube is 18 inches inside diameter. The pressure at the chutes is 120 pounds, which, delivered at the mines, gives something over 100 pounds to the square inch. The capacity of the plant at the air intake is 40,000 cubic feet of air per minute designed to deliver 5,000 cubic feet per minute under 100 pounds pressure at the mines.

The diagram shown in fig. 2 will give an idea of the plan under which the plant operates. While the underlying principle is as old as the world itself, its application to this form of industrial enterprise is entirely new, and too much praise cannot be given the clever inventor, Mr. C. H. Taylor, who is also the superintendent at present in charge of the system.

The huge shafts and tunnel are all sunk in the solid rock. The upper end of the intake vertical shaft, shown on the left side of fig. 2, is closed except for some dozen large circular perforations, and resembles more than anything else, the outlet of an ordinary water sink. This perforated end is kept at such a distance below the surface of the water as is best suited to the proper mixture, by suction, of the air and water; this distance is about 14 inches. The mixture is now carried down the 350-foot vertical shaft in the same way as in a filter pump, but as soon as the bottom is reached and the mixture begins its course along the horizontal 1,000-foot tunnel, the water settles to the bottom and the air escapes upward to the reservoir, where it is held under pressure and from which it can only escape through the pipe line



2—Diagrammatic Sketch of Hydraulic Air Compressing Plant—Cobalt Hydraulic Company



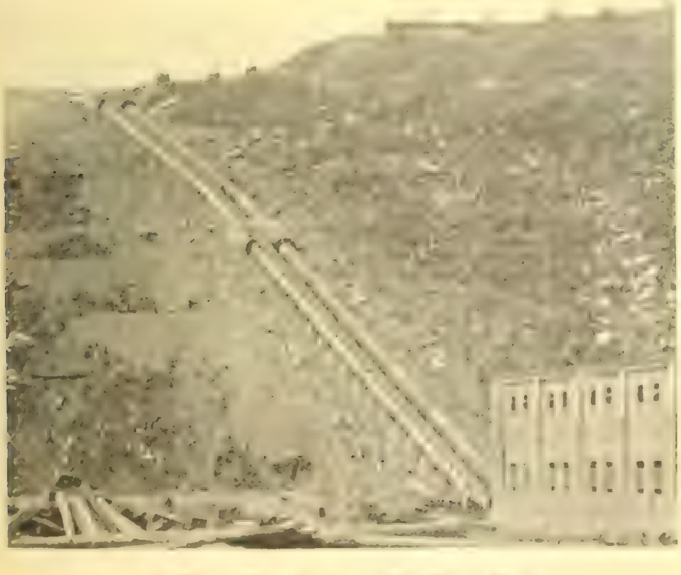
3 Diverting Dam Mines Power Company.

or the exhaust (when the demand is less than the supply).

The Mines' Power Installation

Mr. A. E. Walberg, of Montreal, is largely interested in this plant, which has been constructed by the engineering firm of Smith, Kerry & Chace. The generating station is situated some 26 miles south of Cobalt on the Matabitchouan river. From there the electric power is transmitted to substations in Cobalt, Brady Lake and South Lorraine. The site of the power house is two and one-half miles from the point where the Matabitchouan river enters Lake Temiskaming. The location was most favorable for getting full benefit of the total fall of water at minimum cost. At one point the Matabitchouan takes a sudden curve and doubles back on itself in the short distance of a mile or less. All around this sharp curve was formerly falls and rapids, giving a total head of over 300 feet. The plan of utilization of this fall consisted simply in the construction of a diverting dam at the head of the rapids, and the leading of the diverted water over the steep hill side by the shortest route to the river bed below.

The work was commenced in June, 1909, and in March, 1910, the plant was in operation and supplying power to the mines. The material for building was brought to the grounds by way of Temiskaming, and from there by scows up Lake Temiskaming and the Matabitchouan river to within 500 yards of the power house. All of the machines to be installed and most of the material was placed on the grounds before navigation closed and the remainder was hauled by teams over the chain of lakes from Temagami.

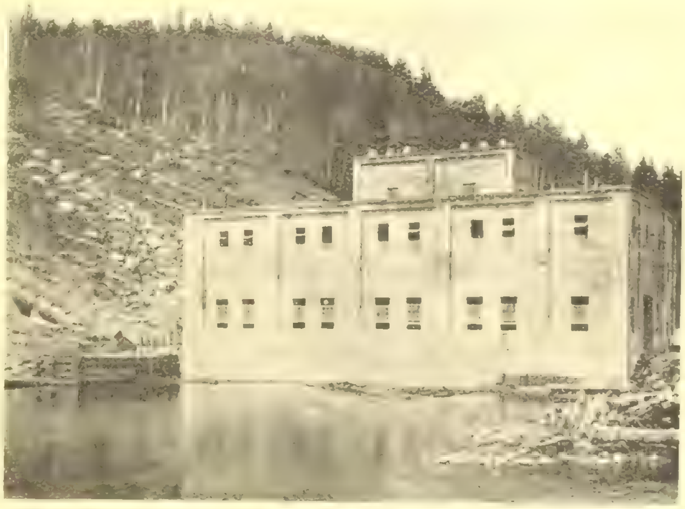


4 Two Pipe Lines 312 Foot Fall

The Storage System

The storage system is an extensive one, developed to a degree quite in excess of what has previously been considered necessary in Canadian plants. The Matabitchouan river in its natural flow varied greatly with the seasons. Possibly at lowest water not more than 2,000 horse power would have been assured. By the judicious damming of a chain or group of small lakes, which are dotted over the drainage area, all the water of the spring freshets can be stored in the various reservoirs. These dams will be opened one by one as demand requires them and a constant supply of approximately 8,000 horse power delivered to the turbines. The drainage area now controlled by this series of dams is about 350 square miles.

The water in First, Second and Third Bass lakes has been raised 40 feet by the main dam. Three dams have been built to hold the water in Rabbit lake, which can be raised 13 feet and has an area of about 7 square miles. Above this lake is White Bear, in which the water can be raised 10 feet. In addition to these there are dams at Ross and Bear lakes, but both of these belong to lumber companies.



5 Reinforced Concrete Power House Mines Power Company

The main diverting dam near the power house, fig 3, is approximately 675 feet long and built of concrete. It has three waste sluices, each 14 feet long, and one log sluice 20 feet long, and a spillway of 30 feet.

There are two pipe lines each 1,054 feet long and 5 feet in diameter, installed by the Jenckes Machine Company of St. Catharines. The pipes (fig. 4) are supported by three concrete anchor blocks, and have concrete saddles at intervals of 12 feet. Each pipe has four expansion joints. A bursting plate and manhole are also installed at the foot of each. There is a net head of 312 feet, which gives a pressure of 126 pounds in the wheel case.

The power house, fig. 5, which is entirely of reinforced concrete construction, contains four turbines with a maximum of 2,750 horse power each, and a normal rating of 2,150 horse power.

The commission appointed by the Manitoba Good Roads Association to award prizes to municipalities in that province for the best kept roads, report considerable improvement in conditions since last year. Four prizes of $50 each are to be awarded.

Cost: the Fundamental of all Construction

Notes on Cost Data and Cost Analysis—Methods of Determining Cost—Examples of how Specifications Affect Cost

By Daniel J. Hauer

It has been said that cost data is of value as long as methods of work remain the same and the price of labor is known. To a great extent this is true, yet many take exception to such a statement and with reason. Much cost data is of little value except to the man who keeps it, owing to the fact that it is incomplete. Then too many costs that are recorded and published are in scrap book form, there being little or no connection between them.

On the other hand, costs should be and are the basis of all commercial engineering and of all contract work. One of the greatest of all American engineers once defined engineering "as the art of doing work for one dollar that any bungler could do after a fashion for two." This is a true definition, and the American engineer and contractor excel in this art. This alone shows the necessity of the engineer and contractor knowing costs.

During recent years there has been much hysteria regarding cost data. Some have advocated costs and cost keeping to the exclusion of everything else. Cost data has been cried from the housetops as the panacea for all evils. On the other hand others have attempted in their ignorance to cry down this important feature of modern engineering. The writer remembers a prominent eastern engineer testifying in a controversy on the cost of doing certain work that the idea "was all wrong, that I do not believe in it, and we are only wasting time by going into this matter from that standpoint." This was in spite of the fact that under his direction, extensive studies had been made by his principal assistants on the cost of the work in question, and his department had collected from engineering journals and books a vast amount of cost data.

Many engineers and contractors are capable and competent to originate and develop a scheme or method of cost keeping. Others can adapt methods already devised to their own needs, and anyone can keep costs under verbal or written instructions, but the application of costs to other jobs and for the purpose of systematizing work is another matter.

"How do you mix your paints, Mr. Opie?" asked a student. "With brains," was the reply of the great artist. Discretion, experience and ability are needed just as much in using costs as in using paints. The novice can do more harm than good in handling cost data, yet this should not deter anyone from keeping costs or making a study of them. A man who has done comparatively little work can become proficient by careful analyzation and study of costs, just as he can become a competent designer by study and practice. The essential thing is to master a subject so that one can apply one's knowledge.

Cost Keeping and Cost Analysis

Cost keeping and cost analysis are often confused. The writer has heard many engineers and contractors speak of a cost analysis they had kept, when they only had a cost record that had never been analyzed. Keeping costs is simply amassing records, which when completed are known as cost data. Cost analysis is the reduction of this data to unit costs, and the analysis of them so as to obtain man, machine or animal units. Thus, segregating and listing costs so that they can be readily applied in estimating the cost of new work, in reducing the cost of work that is being done, and in developing methods and systems of carrying on different kinds of work.

This is the all-important feature of costs, and unless costs are analyzed, their true value is never known. It is for this handling of costs that one must make preparation, and one must be familiar with methods of doing work, have knowledge of the various kinds of machines and their outputs, as well as know the units of work that a man can do in a day. One may study costs without this knowledge, but one can not apply them without it.

One reason that much cost data is of little value except to the man who kept it, is because such data is incomplete. Many details are not recorded for future use. Among the things frequently omitted are wages, the number of hours worked per day, the many local conditions, the time of the year the work is done, the condition of the labor market, the ability and efficiency of the management, the plans and specifications governing the work, and many other details.

The necessity of knowing the specifications has never to the writer's knowledge been alluded to in a discussion of this subject, yet on some classes of work they must be known in order to give the cost data any great value. This information is necessary whenever several classes of work, for unit prices are paid, are done together, and it is not possible to keep the costs on each class. Then the specifications must be known so as to understand how the various classes of work are to be divided; and in order to reduce the costs to unit costs, the contract price for each class of work must be known. This is especially true of classified excavation, such as is done in railroad construction.

On such work there is generally a classification of earth or common excavation, loose rock and solid rock, and on some occasions hardpan. On different railroads the specifications for excavation vary exceedingly. Some materials that are classed under the head of loose rock, as shale, fire clay, shale and chert, are on the other roads considered earth, although they cannot be moved except by blasting. Likewise, there is a vast difference in the classification of loose and solid rock. Many roads make all stones or boulders less than a cubic foot come under the earth class, others use one-half a cubic foot. The majority class everything less than a cubic yard as loose rock, and solid ledges and boulders as solid rock. One road in the south goes to an extreme in this, inasmuch as it throws into loose rock all ledges of solid rock of six inches or less in thickness, separated by strata of clay. If only a single stratum of partly decomposed rock is found in a cut, such a specification would not be so bad, but it is readily seen that alternate thin strata of rock and clay can make the job of excavation a very expensive one.

Cost of Rock Excavation

Naturally, the cost of rock excavation will vary considerably, owing to the conditions surrounding the work and the methods used. The character of the rock will materially affect the price, as well as the angle of the rock to the plane of excavation. The nature of the excavation to be made will enter into the cost, as, in railroad construction, a side hill cut can be made much cheaper than a through cut. Then an important item is whether or not the material to be moved is entirely rock or a mixture of rock, boulders and earth.

In keeping cost data for rock excavation it is a simple matter to arrive at the unit cost of removing solid rock and earth if all the material to be moved in a cut is either one or the other, or if first one class of material is excavated, and then the other when two are found together. But it frequently happens that a single cut will have solid ledges, disintegrated rock, large and small boulders and earthy materials, and the material will be in such shape, or the excavation will be so situated that the various materials must all be excavated together and it is thus impossible to keep the cost of each class of material separate.

With the entire cost of the work kept, and the yardage known, an average price for excavating a cubic yard is easily derived, but this is only useful when the excavation is not classified. For classified work, it is not possible to obtain an accurate unit cost for each class of material, but a comparative cost to the contract price paid can be obtained. With such work, the specifications must be known, to give the greatest value to the data, and the unit costs cannot be calculated without knowing the prices paid for the work.

Method of Arriving at Cost

The method of determining the cost is readily illustrated by an example. A contract has been made for some classified excavation at 60 cents per cubic yard for solid rock, 35 cents for loose rock and 20 cents for earth. The actual cost of moving a small cut of 1,000 cubic yards was $350. Under the specifications the engineer classified the cut as follows: Six hundred cubic yards of solid rock, 300 cubic yards of loose rock and 100 cubic yards of earth. This classification at the contract prices would give the contractor $485, netting a profit of $135.

Now it is found that the cost of doing the work is 72 per cent. of the amount earned, so that the cost of each unit is 72 per cent. of the price of each unit, making a cost for solid rock of 43.2 cents per cubic yard, loose rock 25.2 cents and earth 14.4 cents per cubic yard. If a money loss had been sustained on the 1,000 cubic yards, saying the cost had been $543, then the percentage would have been 112, and the rock excavation would have cost 67.2 cents, the loose rock 39.2 cents and the earth 22.4 cents.

It can be seen that these are not true costs, but as previously stated, comparative or proportional costs, as, in a case where money was lost, the earth may have been moved at a profit, and likewise the loose rock, while all the loss was sustained in blasting and handling the solid rock. Yet a proportional loss would show on both the earth and loose rock. If greater details of costs have been kept, such as explosives, separate from labor and teams, then further to subdivide these costs, the proportion of each detail to the whole is calculated. For example, if the $543 is divided, $70 for explosives, $353 for labor, and $120 for teams, then the detail cost of the solid rock would be 8.74 cents for explosives, 43.68 cents for labor and 8.74 cents for teams, or a total of 67.2 cents

Specifications Affect Cost

To illustrate how te specifications will affect the cost of such work, another example will be taken. Some years ago the writer excavated a cut on one of the southern railroads, the yardage in it being 7,867. Under the specifications governing the work, chert was classed as earth and slate as loose rock. The engineer in charge classified the work as follows: 2,619 cubic yards of earth, 2,831 cubic yards of loose rock, and 2,435 cubic yards of solid rock. Even following the specifications this was a low classification. Of the earth about 600 cubic yards was chert, and about 1,100 cubic yards of the loose rock was a hard slate. The total cost of excavating the cut was as follows:

Explosives	$ 265.55
Foreman and laborers	1,619.35
Teams	273.25
Total	$2,158.15

The average haul of the material was 350 feet. One and one-half yard rotary dump cars were used, one mule and a driver operating two cars. The cost of explosives used were: Black powder, $1.22 per keg; 40 per cent. nitro-glycerin 11¾ cents per pound; Judson powder, 7¾ cents per pound. The average wage paid to men was 13.4 cents per hour, and to foremen 28.6 cents. Two cars, one mule and a driver were charged at $2 per day. The cost per cubic yard for the work was: Solid rock, 46.8 cents; loose rock, 24.6 cents, and earth 12.3 cents.

Now had this work been done for a competing railroad which had attempted to locatea line through the same mountain pass, a different classification would have been put on the work, since under this road's classifications, chert is classified as loose rock, and slate as solid rock. Thus the 7,867 cubic yards would have been classified as follows: 2,019 cubic yards of earth, 2,331 cubic yards of loose rock and 3,535 cubic yards of solid rock. The total cost of doing the work remaining the same, and the contract prices unchanged, the unit cost for doing the work would then have become as follows: 40.9 cents per cubic yard for solid rock, 21.4 cents for loose rock and 10.7 cents per cubic yard for earth. For easy comparison we place them thus:

	Solid rock.	Loose rock.	Earth
1st classification, per. cu. yd.	46.8c.	24.6c.	12.3c.
2nd classification, per. cu. yd.	40.9c.	21.4c.	10.7c.

Another example taken from the writer's own experience shows how classification can affect the unit costs of doing such work. A description will assist in illustrating.

The cut was on the same road mentioned above. A little more than one half of the cut was solid gray sandstone, while in the other end slate occurred in the bottom, but little of it had to be excavated. On top of the slate there was a stratum of fire-clay shale, upon which was disintegrated shale, and then a stratum of fire clay. Upon this clay were large sandstone boulders lying very close together. During the winter months the shale slid on the fire-clay shale and brought several thousand yards of rock into the cut. A thousand yards of the material was hauled out of one end of the cut with an average haul of 250 feet. About 6,000 cubic yards were hauled across a temporary trestle, the average haul being 755 feet. The rest of the yardage had an average haul of 500 feet. The total yardage excavated was 13,661 and the following classification was placed upon it: 868 cubic yards of earth, 1,117 cubic yards of loose rock, and 11,676 cubic yards of solid rock. The cut was worked from both ends, and in addition, an entry was made on the side and a track built around a small hill to hasten the completion. This entrance cost $85.45, which expense was borne by the contractor. This also added 65 feet to the haul, 4,500 cubic yards being hauled over the extra distance. Small rotary dump cars were used. A year was consumed in making the cut, as it was commenced in August and some work was done each month until the cut was completed the following August. The cost, including extra haul and side entrance, was:

Explosives	$1,090.12
Labor	4,978.02
Teams	777.00
Total	$6,845.14

The cost per cubic yard was: For earth, 14.4 cents; loose rock, 28.8 cents, and 54.8 cents for solid rock. Previous to taking up the final estimate, the division and resident engineer had placed the following classification on the material: 450 cubic yards of earth, 217 cubic yards of loose rock and 12,994 cubic yards of solid rock. This had given unit costs for doing the work of 13.6 cents for earth, 27.2 cents for loose rock and 51.7 cents for solid rock. The chief engineer re-classified the cut, making the shale and fire-clay shale loose rock and the clay that caused so much trouble in the cut, earth. During the four months, January to April, owing to the presence of the shale and clay, the men worked in this cut standing in mud and water that was ankle deep. The material shovelled would often run out of the cars on the way to the dump. All the drainage possible was given the out, but the entire flow from one side of the mountain seeped into it. It was owing to these conditions that the better classification was made, but the unit costs were raised by the chief engineer, thus knocking some profit out of the work.

From the cases cited, it is seen that in considering such costs the specifications must be known, and not only kept in mind, but notes must be made as to the manner in which they were interpreted.

Applicable to Concrete and Other Work

What is true regarding this class of excavation is also applicable to concrete work, when several grades or proportions of concrete are used in a structure, and in such a manner that it is difficult to keep the cost of each separate, the various grades being paid for at a common price. Any costs must be proportional ones, based on the amount of cement used.

The same principle also applies to other classes of work, and shows the necessity of carefully studying and analyzing costs before applying them to other work.

The application can be made, however. We believe that the only correct way of estimating bidding prices is to break up work into its various component parts, and by using costs obtained from similar work, and based on conditions that surround the new work, thus obtain new prices. The only other method is to guess, and to guess in lumps is certainly far worse than to guess in small units, for some of the units can be definitely obtained, possibly leaving but a few small items to be set down from a guess.

However, the great use for cost keeping and cost data is not to make estimates upon other work, except in the case of engineers, but is for keeping a check on the amount of work done by men and machines, and for systematizing work and deciding upon the proper methods to be used.—"The Contractor," Chicago.

Uses and Advantages of Hydrated Lime

An Excellent Waterproofing Compound to Add to Cement—Its Successful Application at Kingston, Ont.—Standard Formulae for Use

The use of hydrated lime is a growing one with contractors and builders, but many do not appreciate how useful an article it really is, and what numerous advantages it possesses over lump lime. R. K. Meade, in an article in "Municipal Engineering," outlines some of its advantages. A portion of the article is as follows:

Hydrated lime can be used for every purpose for which quick lime is used, and also for all purposes for which lime putty is used. It has also some uses which neither have. It, however, does not trowel quite so easily as lime putty, and this has been the greatest objection on the part of the mason to its use. By employing a good deal of water in the mortar, however, this objection can be to a great extent removed. The greater convenience with which it can be handled and used, however, and the thoroughness with which it has been slaked, to a large extent make up for this trouble. No mortar box is required and the hydrated lime and sand may be mixed upon a board, just as are cement and sand. It is, therefore, especially convenient for doing small jobs, such as repairs to plaster, etc.

It is estimated that it costs 25 cents per barrel to slake lime in a mortar box. This expense is saved by the use of hydrated lime. Furthermore, the mixing can be done indoors and in cities the streets are not blocked.

In using hydrated lime the mason should remember that not quite as much water would be required as is the case with lump lime, because in the case of quick lime some water is needed to combine with the lime, and in case of hydrated lime this water has already been supplied by the manufacturer. Where a mortar box is used, it is usually considered best to first place the water in the box and then the lime. More water and then lime can be added as necessary, the idea being to get a thorough mix of water and lime. It is usually considered better to allow the mixture to remain over night. Such a mortar can be used just as lime putty, and if plenty of water has been employed, will trowel very similarly.

Used With Portland Cement

One place where hydrated lime can be used, where ordinary lime putty can not be employed, is with Portland cement. The addition of lime to Portland cement is not an adulteration, but confers a great many good properties to the latter. It has long been known that slaked lime would waterproof concrete. This is due to the fact that it exists in the form of an extremely fine powder, many times finer than the finest ground cement. This fine powder fills in the pores of the concrete and stops them up, thus excluding the water. Owing to the difficulty of mixing the wet lime putty with the dry cement and sand, however, it has only been since the introduction of dry hydrated lime that slaked lime could be used for waterproofing. It is generally considered that hydrated lime is the best waterproofing compound which can be added to cement, and that it is superior in lasting qualities to any of the waterproofing compounds at the present time advertised for this purpose. The writer has tested some eight or ten of these compounds. In every instance, without exception, they decreased slightly the strength of the cement mortar made therefrom, and he does not think that any of the manufacturers claim that they add to the strength of concrete. Hydrated lime, on the other hand, not only waterproofs the concrete, but numerous tests made in different laboratories by disinterested parties show that additions of hydrated lime up to 15 or 20 per cent. increase the strength of cement mortar.

As an actual waterproofer, hydrated lime is not surpassed by any of the waxes and paraffin compounds at the present time used for this purpose. Many of these compounds are organic, and in time will volatilize, leaving the concrete porous. Hydrated lime, on the other hand, is inorganic or mineral, and will remain where it is put.

As an example of the waterproofing properties of hydrated lime, this was employed upon a large gas holder at Kingston, Ont., which had been practically a failure, owing to the leakage of the concrete wall of the gas holder. A number of waterproofing methods were tried, all of which failed, and it was not until this wall was chipped back from three to six inches by means of pneumatic chisels and a new wall composed of concrete, containing about 18 per cent. of the weight of the cement of hydrated lime had been added, that the tank was waterproof.

The addition of hydrated lime to cement makes the latter more plastic and easily trowelled. It also improves the adhesive properties. A mixture of equal parts of hydrated lime and Portland cement makes an ideal mortar for laying brick. The addition of hydrated lime to concrete blocks makes the latter whiter, tougher, and waterproof.

Hydrated lime is not only the best but also the cheapest waterproofing compound known, since it replaces so much cement and the only additional cost is the difference between the price of cement and hydrated lime, which is slight, even at the present low price of cement.

Standard Formulæ for Use of Hydrated Lime

First cover bottom of mortar box with water and add the hydrated lime and more water as is necessary. Some mechanics prefer to soak the hydrated lime at least twelve hours before using, claiming more plasticity in its manner of working.

For Plaster Mortar—First or Scratch Coat: 350 pounds hydrated lime, 1-4 yards screen sand, 2 bushels hair. Should cover about 100 square yards.

Second Coat: 200 pounds hydrated lime, ½ yard screen sand. Should cover about 100 square yards.

Putty or White Coat: Use about one-half as much plaster to gauge with as is commonly used with putty made from lump lime. If wall is dry sprinkle or dampen with brush before putting on white coat, as labor will be lessened.

Float Finish: 300 pounds hydrated lime, ¼ yard screen sand. Should cover about 100 square yards.

For Stone Mortar: 200 pounds hydrated lime, ⅝ yard screen sand and add water.

For Brick Mortar: 250 pounds hydrated lime, ⅝ yard screen sand.

Hydrated Lime and Portland Cement Mixture for Laying Brick and Stone—For hard mortar for these purposes use equal parts by weight of hydrated lime and Portland cement. Add required amount of sand to properly gauge up mortar.

For Waterproofing Concrete and Concrete Blocks—Replace 15 to 20 per cent. of the weight of the cement used in the mortar by hydrated lime.

To sum up the Advantages to the Dealer—It is first of all a fixed product which does not deteriorate or change with age, nor swell and burst its packages, consequently it is always worth the market price of lime. Second, it can be handled without risk of fire, and, third, it can not only be used for all purposes for which lime is used, but also has many new uses, and is more convenient of application.

It has been aptly said that hydrated lime is the twentieth century way of handling the lime trade.

Proposed C.P.R. Tunnel Through Ottawa

The proposed C.P.R. tunnel through Ottawa would be 4,825 feet long. The portals would be near the east end of Wellington street, on the east, and the city waterworks on the west. It is planned to be 26 feet wide and 20 feet high. This 20 feet includes 2 feet below the grade to allow a roadbed of broken stone. The rock formation is stratified limestone, lying almost flat. The layers run from 6 inches to 2 and 3 feet thick. There are good facilities for carrying on the work from both ends simultaneously. This limestone formation is such that it is not anticipated there will be any need for lining the tunnel except at the portals. Throughout the entire location there will be from 25 to 50 feet of roof over the tunnel. The average thickness will be 35 feet. Owing to the building and traffic along the street, and the depth of the tunnel, it must be bored from the ends. It could not be made cut and cover as there is no clay, the limestone being stratified, the thick broken stone roadbed, and being a .4 grade, it is believed that there would be no vibration noticeable on the surface and in the buildings along the route. The contractor would have to supply the compressed air, none being sold in Ottawa. The work is estimated to cost a million dollars, and to take about two years to bore the hole. Cauchon & Haycock, Ottawa, are the engineers in connection with this work.

Application has been made for the incorporation of the International Portland Cement Company, Limited, of Spokane, Wash. The president of the concern will probably be Mr. J. S. Irvin, the founder and managing director of the big international plant in Ottawa. Mr. Irvin was also largely instrumental in organizing the $30,000,000 merger of Canadian cement plants, being now an active member of its board of directors. The permanent board of directors of the new concern will include: Rodolphe Forget, M.P., C. A. Barnard, K.C., and W. Grant Morden, all of Montreal; Hon. J. P. Hartman, Seattle, Wash.; C. A. Irvin, secretary of the International Portland Cement Company, Ottawa; D. P. McKinnon, Calgary, director of the International Portland Cement Company, Ottawa; S. G. Near, Toronto, and H. D. McKinnon, Spokane.

Ottawa as an Ocean Port

An interesting address was given by Mr. N. Cauchon, consulting engineer, of Ottawa, before a recent meeting of the Ottawa branch of the Canadian Society of Civil Engineers. The topic of Mr. Cauchon's discussion was the proposed C.P.R. tunnel through Ottawa, of which a brief description is given elsewhere. Mr. Cauchon spoke in part as follows:

"To those who are interested in the water port of Ottawa, I might draw your attention to the fact that we have practically no available water frontage for business purposes, outside of such limited areas as Mr. Booth's wharves, the Queen's wharf and W. C. Edwards'. The Ottawa water frontage is miles of park. By putting locks in the old timber slide, the basin above the falls could be made a large and very commodious shipping port. If these locks were 10-foot draft they would accommodate any loads now passing through the Carrilon-Grenville canal, and later on when the Georgian Bay canal exists a lift of one lock, Georgian Bay standard, would put you from the basin up into the large lake above the proposed Georgian Bay dam. If these were carried out Ottawa would become an ocean port on the Georgian Bay canal Without it Ottawa may have to be content with looking at the boats going through Hull.

"Ottawa is no doubt on the verge of great industrial developments and it seems to me an opportune time for the city to meet half way those who are proposing to spend large sums towards development, and it will be of great value to Ottawa to anchor for all time the main line of the Canadian Pacific Railway. The tunnel will always be worth what it cost, and it will always be a hole in the ground. The advantage which the city will reap will be of an accumulative kind, and go on increasing in value in such ways as the greater facilities for communication between the different parts of the city; the elimination of the canal as a retarding barrier, which in three miles has only two openings; the vast increase in property value to the individual and in assessments to the city.

The question is one of opportunity both for the C.P.R. and the city, in which, if you both contribute, you will both derive great benefit."

The new by-law framed recently by the City Architect of Toronto is a source of objection to the Builders' Exchange, which is taking steps with a view to having the provisions of the proposed measure altered. The new by-law provides that: "As soon as either the walls or structural steel of any building in process of construction have reached the level of the first floor the joists for such floor shall be placed in position and permanently secured, and the joists covered temporarily to secure reasonable safety for the workmen engaged, to the satisfaction of the building inspector. As the building progresses from floor to floor, the joists of each floor shall be put in and similarly covered." The Builders' Exchange points out that the by-law is not applicable and that in putting up steel structures it is essential that no permanent [illegible] must be placed in position until the frame work is completed.

Canadian Railroad Developments

Representing the constituency of Milestone, A. E. Whitmore, J.P., of Regina, Sask., is now in Winnipeg for the purpose of urging the Canadian Pacific to complete the 25 miles of new line from Weyburn to Forward, Sask.

Johnson & Carey Company have work under way constructing a fill across Rainy Lake for the Canadian Northern Railway, to replace the trestle at Fort Francis, Ont. The work will involve the excavation of nearly 2,000,000 yards of bastard granite.

The railway commission recently held a meeting in Ottawa, Ont., for the purpose of dealing with the application of the Transcontinental Railway for running rights over the Canadian Northern in Winnipeg, Man., so as to establish a through line from Edmonton, Alta., to Fort William.

It is said that the Canadian Pacific is planning to shorten the running time from Halifax to Montreal several hours by constructing a cut-off from McAdam or Fredericton Junction in a straight line across the country to New Brunswick and Nova Scotia to the proposed winter port at Halifax.

Instead of the double tracking of the Canadian Pacific Railway line from Smith Falls, Ont., to Peterboro, as recently rumored, it is reported that engineers have been placed in the field to make surveys for an entirely new road west from Smith Falls to Toronto, traversing a country heretofore not served by any line. The present line west of Belleville is very hard to operate on account of the grades, and survey has already been run for the new improvement between those two places, passing north of the Rideau lakes.

In Cobourg, Ont., it is now expected that the Canadian Northern Railway will rush the completion of their line eastward from Trenton to Deseronto. It is stated that contracts for 30 miles of construction have been let, and work will begin at once. This section is comparatively level, and construction work no doubt will progress speedily. Mr. Duff, who has been on Mr. George Armour's engineering staff at Colborne, will be, it is stated, resident engineer on the new C.N.R. construction east of the Trent river. Messrs. Dilona and Orlando Bros. are finishing up their work on the section between here and Brighton, and may go shortly to Montreal to begin work on the Ottawa-Montreal section of the C.N.R.

Plans have been approved by Premier Sifton, according to advices from Edmonton, Alta., for the Pincher Creek, Cardston & Montana Railway, a line which will traverse the whole province of Alberta from the international boundary to Peace River Crossing, a distance of 700 miles. As proposed the first section will run from the boundary northwest through Cardston and Pincher Creek to the west side of section 34, township six, range two, west fifth meridian, along the south fork of Old Man river. Connection will be made with the C.P.R. at Pincher Creek, and the system will connect with the Hill lines in Montana. The promoters are New York capitalists, railway builders and coal men. At the next session of the Legislature the company will apply for an extension of the charter permitting them to construct the main line through Alberta by way of Calgary and Edmonton in the Peace River country. There will also be a branch line in the south into the Kootenay coal fields, where, it is understood, coal lands have already been secured. The company has had engineers in the field all summer, and is starting construction at the boundary.

At a recent meeting of the Railway Commission, at Vancouver, B.C., the matter of granting the Canadian Northern Railway the right to construct a line on the right of way of the Canadian Pacific through the Fraser Canyon near Lytton and to a point 7 miles above the canyon, was taken up. The Canadian Pacific did not object to the use of their right of way through the canyon, but held that it was unnecessary for the Canadian Northern Railway to use the additional 7 miles. The commissioners decided that the Canadian Northern would be infinitely more economical to build on the C.P.R. right of way, and for this purpose to nominate an independent engineer to estimate the alternative costs of construction. Both railways agreed upon C. E. Cartwright, who stated it would take him two months to go over the ground.

Location surveys and map of the proposed route of the Canadian Northern Railway from St. Albert to Yellow Head Pass, according to advices from Winnipeg, Man., have been filed with and approved by the Minister of Railways. According to plans the line for some distance east of Yellow Head runs close to the Grand Trunk Pacific. It is proposed to have 50 miles completed this year.

Personal News and Notes

Mr. H. S. Wormack has been appointed city clerk of Fernie, B.C., to succeed Mr. G. H. Bolton, who is resigning.

Howard Douglas, Commissioner of Dominion Parks, will establish headquarters at Edmonton and take up his residence there.

The Board of Control of Toronto have recommended that a by-law be submitted to raise $100,000 for improved highways in the county of York.

At Fort William, Ont., the building permits for August, 1910, showed an increase of 21 per cent. over August, 1909, The respective totals were $204,585 and $168,935.

The contractors for the substructure of the Quebec bridge recovered last week from the debris the body of another victim, that of Frank Karley, a Caughnawaga Indian.

The city council and the Board of Trade of Windsor, Ont., are making a joint petition to the Dominion Government for the erection of a new federal building and dock next season.

Messrs. Shattuck & Hussey, architects, of Chicago, have been appointed to consult with Messrs. Burke, Horwood & White, the Toronto firm, in regard to the design for the new Y.M.C.A. buildings at Toronto.

The Ontario Iron & Steel Company last week turned out a wheel weighing 12 tons, the largest casting ever made in Canada. It was manufactured for the Allis, Chalmers, Bullock Company, Limited, Montreal.

Mr. David Murphy, who superintended the construction of the lift locks on the Trent canal for the Dominion Bridge Company, was run down by an automobile at Montreal recently and died shortly afterwards.

The city of Quebec has instituted proceedings to recover $200,000 from the Canadian Northern Railway Company on account of the company's failure to erect a workshop in acaccount of the company's failure to erect workshops in acthe road and the city.

The Vulcan Iron Works, Winnipeg, which claimed $50,000 damages from the city for injury to business and depreciation in value of property through the building of the C.P.R. subway and the consequent closing of the city streets crossing the tracks, have been awarded $25,000 by the arbitrators This is the last of the subway claims against Winnipeg.

The death occurred last week at Toronto of Mr. Robert Grant, president of the Grant Contracting Company. The late Mr. Grant, who was nearly 70 years old, came to Toronto many years ago from Morrisburg. Mr. Grant was responsible for a considerable amount of important construction in the city, among which may be mentioned the Parkdale subway.

Among those who have declared themselves in favor of a permanent and visible supply of water for the city of Winnipeg is the Hon. Robert Rogers, Minister of Public Works

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,
etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P. Q.

Montreal Office - CORISTINE BUILDING

for the province. Mr. Rogers says that nothing but a visible supply is commensurate with the increasing needs and importance of the city. He suggests Shoal lake as the best source.

A number of leading citizens of Victoria, B.C., are discussing the formation of a good roads association in that city, with the object of raising $100,000 for expenditure upon the general improvement of roads in Vancouver Island. The Provincial Government is promising financial assistance.

Hamilton, Ont., is to be congratulated upon having secured the Canada Steel Company, Limited, who will erect a $400,000 plant. The first structure will be a steel mill, 250 x 70 feet, and machine shops, tube mill, office, etc., will follow after. The company will roll entirely from old scrap rails, the first plant of its kind in Canada. The directors of the new company are F. W. Baillie, Toronto, president; R. M. Bertram, Toronto, vice-president; W. M. Currie, Hamilton, managing director; A. L. Malone and G. A. Morrow, Toronto. Hamilton's advantages in shipping facilities induced the company to locate there.

Canadian City Engineers

Mr. A. H. Van Cleve, London, Ont.

Mr. A. H. VanCleve, who has been appointed city engineer of London, Ont., enrolled as a student at Lehigh University, South Bethlehem, Pa., in 1886 and graduated with the degree of civil engineer in 1890.

During the summer of 1889 he engaged with the Lehigh Valley Railroad Company as bridge inspector and computer. From May, 1890, to April, 1892, he was employed by the Brooklyn Elevated Railroad Company, Brooklyn, N.Y., in the capacity of draughtsman, designer and instrument man. During this period the terminals in East New York were being designed and surveys made for the 5th and Fulton avenue extension. His work consisted largely in calculations and designs for steel work and the preparation of maps for the legal department.

From April, 1892, to January 1, 1899, he was engaged by the Niagara Falls Power Company, Canadian Niagara Power Company and allied concerns. From the last named date he executed various commissions until October, 1900, when he was made principal assistant engineer in charge of all design and construction for the Niagara Falls Power Company, by whom in March, 1904, he was appointed resident engineer in full charge of construction, excepting electrical work. On December 1, 1904, he was appointed to the same position in respect to the Canadian Niagara Power Company's work. Later, he was made engineer of both companies, a position he retained until January 1, 1908, when, upon the completion of constructional work, he was appointed consulting engineer. Since January, 1909, Mr. VanCleve has been engaged in general consulting work, devoting special attention to hydro-electric development. For some months he was at Cobalt in charge of the Cobalt Hydraulic Company's work there.

The companies associated with the Niagara Falls Power Company and Canadian Niagara Power Company were the Niagara Junction Railway Company, Niagara Falls Water Works Company and the Niagara Development Company. The first named company built and operated, subsequent to 1892, a terminal railroad connecting the several tenants of the Niagara Falls Power Company with the trunk lines entering Niagara Falls. While this railroad is of small extent, it involved the usual railroad problems, aside from heavy grading. The Niagara Falls Water Works Company was a private company for some years closely associated with the Niagara Falls Power Company. This company, during the time of Mr. VanCleave's connection therewith, installed a steam pumping plant, a system of mains covering about one-half of the city, a stand pipe, a mechanical filtration plant and Riedler pumping engines driven by Pelton wheels. The Niagara Development Company built a village in the vicinity of the lands of the Niagara Power Company for the purpose of furnishing a place of residence for the employees in the several factories. This work involved the building of a system of sewers and drains, and sewage disposal works, the grading and paving of streets, laying of water pipes, conduits, etc., as well as the designing and erection of the dwellings.

The work of the Canadian-Niagara Power Company and the Niagara Falls Power Company during the period of Mr. VanCleave's connection with them is perhaps so well known as to require no description. It will suffice to say that the companies own about 1,500 acres of land, over which it was necessary to build streets, lay a large system of conduits, sewers and water pipes for supplying the various tenants. The hydro-electrical installation of the Niagara Falls Power Company consists of 110,000 h.p. in 21 units, all of this installation being made subsequent to 1892. Mr. VanCleave had charge, either as principal or assistant, of all the designs for the Canadian-Niagara Power Company other than electrical, and, as stated above, was in charge of all the construction of the plant and transmission lines subsequent to December 1st, 1904. The installations of that company consist of a forebay, wheel pit and tunnel with a capacity of approximately 110,000 h.p., while the machinery installed during Mr. VanCleave's connection with the company aggregates over 50,000 h.p., together with the necessary power house, transmission station, conduits, etc. As consulting engineer Mr. VanCleave has made reports on hydro-electric developments proposed in various places.

The Forest City is to be congratulated upon having secured the services of an engineer whose experience qualifies him so eminently for municipal work.

English Firm's Enterprise

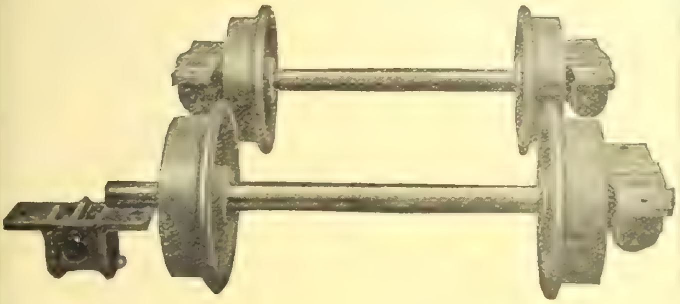
One of the most interesting exhibits at the Canadian National Exhibition, held recently at Toronto, was that of G. Woolliscroft & Son, Limited, Hanley, Staffs., Eng., represented by H. M. Robinson & Company, Toronto. The sample tiles shown represented the highest class of workmanship and called forth many expressions of commendation from visiting architects.

These tiles are used for the interior of large office buildings, public buildings and for various uses in private residences, such as for porches, bathrooms and kitchens. The samples displayed included glazed and enamelled tile in various designs, embossed in three, four and five colors. The tiles were designed by leading British artists. Attractive designs in terra cotta, both plain and glazed, were also shown. The glazed terra cotta is known as Pentillicon and is especially adapted for Canadian requirements in large office buildings.

The tile paving comprising the floor of the exhibit room was executed in some of the leading Woolliscroft lines. The left hand side was paved in ceramic mosaic, the middle portion with Rust's vitreous mosaic paving, and the right hand side with 6-inch quarries and red floor tile. In front was a cleverly executed facsimile of the agents' signature. Before this were displayed sample road paviors. The checkered brick shown in this exhibit are used for stable paving and garage floors. They are guaranteed absolutely impervious to absorption.

Messrs. Woolliscroft & Son, Limited, are meeting with gratifying success in the Canadian field. Recently, we learn, they have been awarded an important contract for terra cotta at Montreal, besides a number of various contracts for the supply of floor and wall tiles.

Build Your Own Cars Using Our Irons



Your cars will cost you less, and will be built just to your liking

We make a business of manufacturing car wheels, axles and boxes.

We employ expert, high-priced metallurgists to regulate the composition of iron in our wheels and get just the right chill.

We guarantee our car wheels to be strong, tough and well chilled, ensuring long service.

We make wheels any size, fit them to axles for any gauge track, and supply any style of box required.

Let us quote you.

Marsh & Henthorn, Limited

Makers of Hoisting Machinery **Belleville, Ont.**

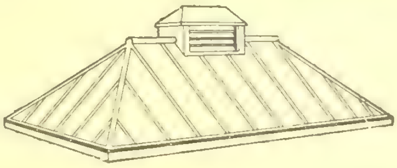
Sales Agents: MUSSENS LIMITED, Montreal

"A work ill done must be twice done—only the best gives satisfaction."

The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

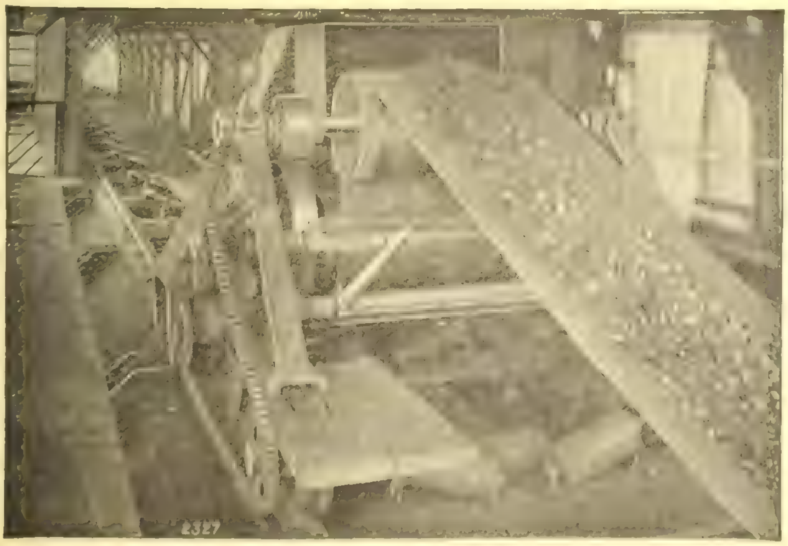
Information and prices on request.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

FOR TRANSMISSION AND CONVEYING



A 30" Extra Stout Scandinavia Belt in Operation Carrying Coal

A Solid-woven, Impregnated Textile belt.

Equally good in wet and dry places.

Not made in plies and will not come apart.

Made in three weights and in widths up to 60 inches.

WE GUARANTEE that this belt on a basis of price will give you better service than any belt on the market.

Write for Bulletin "A" and Discounts to

Federal Engineering & Supplies Limited

284 Yonge St. - TORONTO

Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK
WIRE CLOTH AND WIRE GOODS

Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

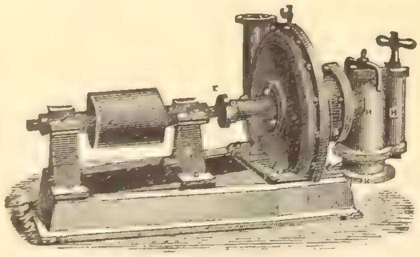
Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

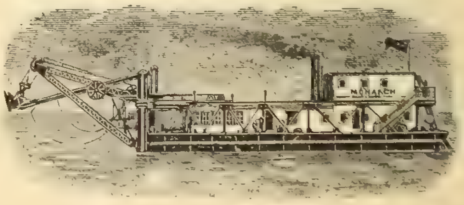
Write for Catalogue

Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited **Welland, Ontario, Canada**
Dredges, Ditchers, Derricks, Steam Shovels
Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.

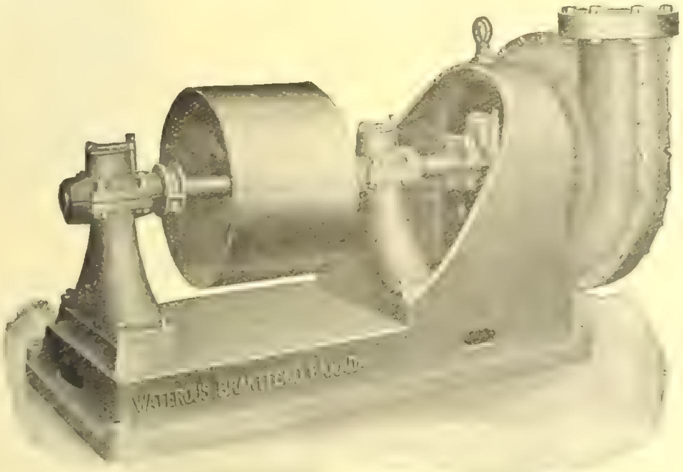


"Galvaduct" and
"Loricated"
CONDUITS
For Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Sand and Gravel
We can supply you with Sand and Gravel
Screened, Pit Run and Pea Gravel
Building Sand
Let us quote you on your next job
Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North [illegible] Evenings, North [illegible]

THE
CONTRACTOR'S PUMP



We have designed a pump in which Simplicity, Strength, Durability and Compactness are combined, and which is specially adapted for general contracting purposes.

It will not clog up, will run every minute of a ten hour day, and can be left to the care of an unskilled laborer without going to pieces.

Built in sizes with discharge openings from four to fourteen inches. Can be belt, engine or motor driven, in Vertical or Horizontal styles.

Write for our complete Pump Bulletin No. 200.
Fully Illustrated

NOTICE THE SPLIT-BASE!

The Waterous Engine Works Co., Ltd. Brantford, Canada

Save from 25% to 50% of Steel
by using the
"Burrowes" Patented System of Reinforcement for Concrete
A perfect reinforcement for beams, girders, [illegible] retaining walls, culverts, circular conduits, concrete poles for power and telegraph lines, and every kind of concrete construction.

We will supply reinforcement fabricated, or will [illegible]. For further information apply to
SIDNEY BURROWES, Niagara Falls Centre, Ont.
Canadian Patent No. [illegible]. Patented [illegible] U. S. A.

White Integral Supports
for Furring Bars

Make the best and most economical ceilings.
Immediate delivery can be made.

Dominion Fireproofing Co.
EADIE-DOUGLAS, LTD., Sole Agents
12 University St., MONTREAL, CANADA

THE
MILTON
PRESSED BRICK CO.
LIMITED

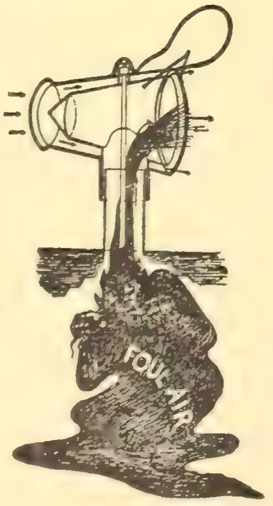
Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

AUTOFORCE
VENTILATING SYSTEM



(Patented)
Autoforce Air Pump Ventilator

Write us for full
Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

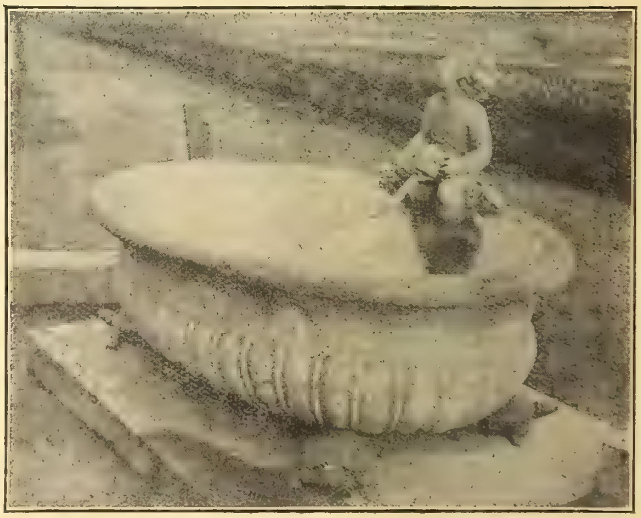
Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg.,
Montreal, Que.

Telephone Main 159



Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE
CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read **The Cement Era.** The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.
1800 Monadnock Block - - CHICAGO

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

Canadian Agents
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

You'll Never Regret It

This is the busy season for architects and contractors, preparing plans and specifications for Fall operations be sure you recommend

Port Credit Brick

It's the make that lasts the longest, looks the best

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phones : Office 1217
Yard 4507

Sand & Supplies, Ltd.
TORONTO

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
—HEAD OFFICE:—
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

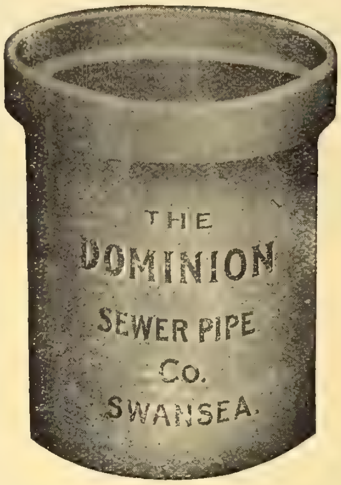
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

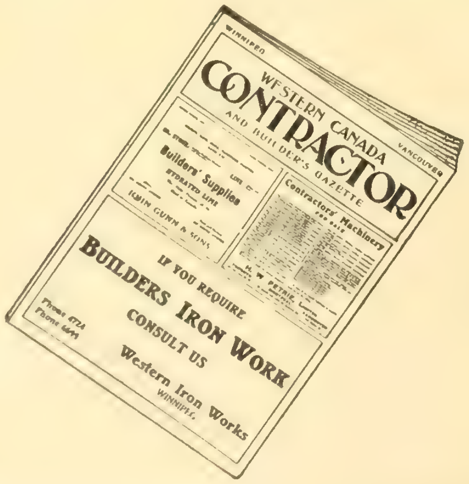
also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Glazed Earthenware
in the world.

Sewer Pipe
Single and Double Strength. Sizes 3″ to 42″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

R. H. NEW,
Vice-President.

J. H. NEW,
President.

To do One Thing Best has been Our Desire for 50 Years, and To-day

we have our reward in knowing that

HAMILTON
Vitrified
Sewer Pipe

is known throughout Canada as the one line of SEWER PIPE that has proved to be absolutely reliable.

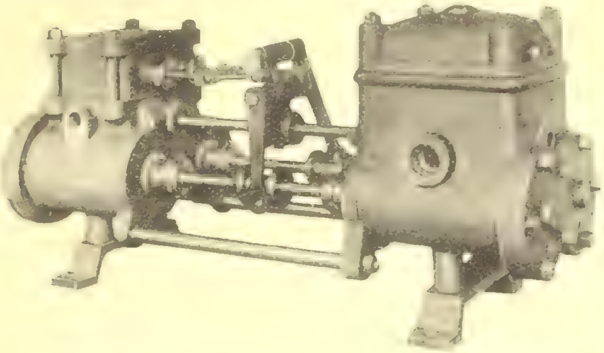
You can depend on our material, our loading and prompt delivery.

Prices always right. **Let us show you.**

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

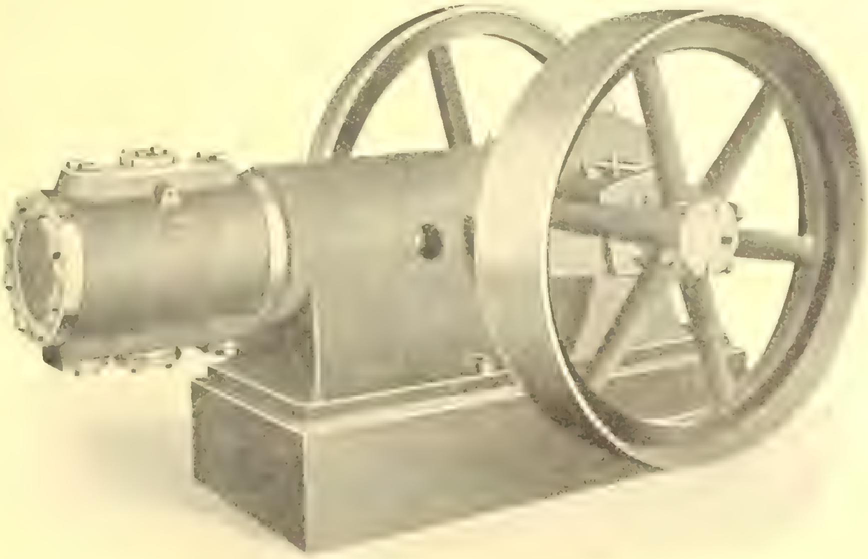
Martin Pump & Machine Co.
Limited
Toronto, Canada

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive

The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.



Canada Foundry Company, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

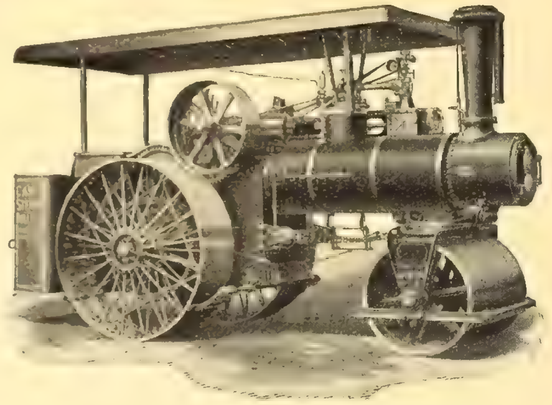
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

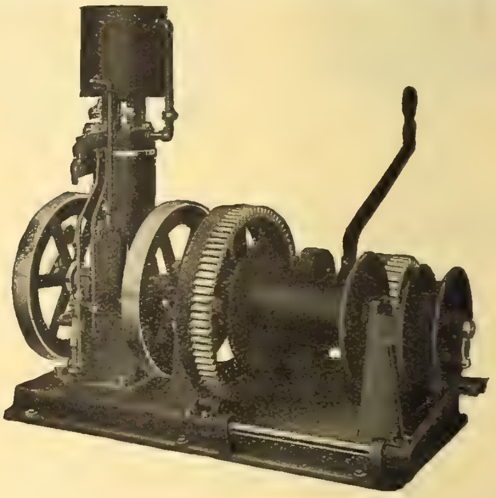
J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.

Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co. Limited

- Roofing Slate
- Red Slate
- Green Slate
- Mottled Slate
- Black Slate
- Blackboards Slate
- Structural and Electrical Slate
- Terra Cotta Tiles
- Asphalt Pitch
- Tar
- Asbestos Sheathing
- Building Papers
- Tarred Felts
- Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

- Glass Wired and Rough Rolled
- Galvanized Sheets
- Black Sheet
- Copper Sheet
- Tinplates
- Canada Place
- Zinc Sheets
- Corrugated Iron
- Gutters
- Pipes
- Elbows
- Spikes
- Nails
- Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridges' Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The

KATIE

Foundry,
Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc.,
Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E. Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.
67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal
Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to colo., 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends 50 per cent

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Beauchamp & Gagnon, plumbers, Montreal, Que., are stated to have dissolved.

Moquin & Marson, roofers, etc., Montreal, Que., are stated to have dissolved.

Alcide Bodard, lumber and mill owner, Port Daniel, Que., is stated to have dissolved.

D. G. Sinclair, painter, Keewatin, Ont., has, it is stated, been succeeded by L. F. Sinclair.

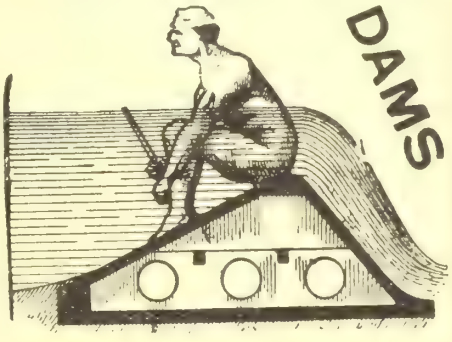
W. T. Creighton & Company, roofers and tinsmiths, Hamilton, Ont., are stated to have dissolved.

The assets of Steele & Company, [illegible] and [illegible] manufacturers, Smith's Falls, Ont., it is stated, are to be sold.

Theo. A. Barrow, lumber dealer, Grandview, Man., it is reported, will open up branches at McNutt and Wroxton.

It is stated that the Richardson Roofing Company, Toronto, Ont., are succeeded by the Roofing Company of Toronto.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q.

Established 1882
THE COMMERCIAL
The Weekly Financial Commercial & General Trade Newspaper of the Great West.
Winnipeg Manitoba

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor   Entire building of Alsen's Cement, Reinforced Concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works

45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited

Woodstock, Ont.

The

"Simplex" Stone and Marble Cutter

Does away with sharpening of tools. When the teeth are worn replace with a new blade. The new blades are cheaper than sharpening, and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"

Composition Flooring

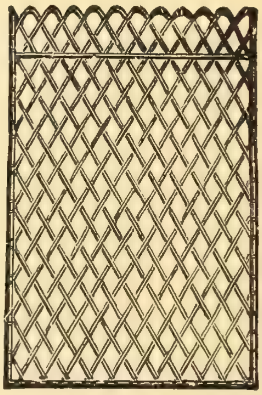
Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

from all danger of accidental breakage by using

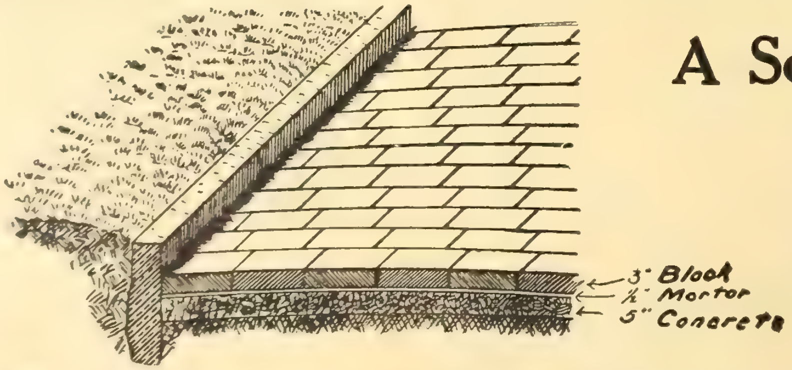
Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co., Limited

Hamilton, Ont.   Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

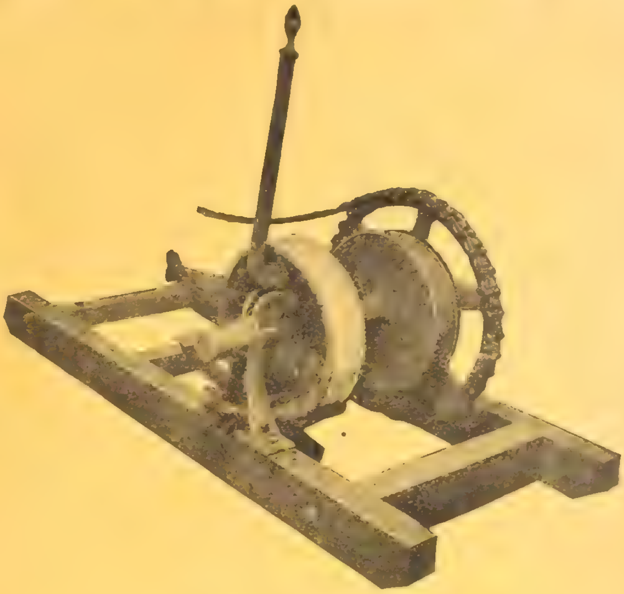
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited

Engineers and Machinists London, Canada

These are Right

ELBOW

TEE

CROSS

IF THERE IS AN
S ON THEM S

We manufacture and stock a full line of Screwed and Flanged Cast Iron Fittings.

Send for a Catalog

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

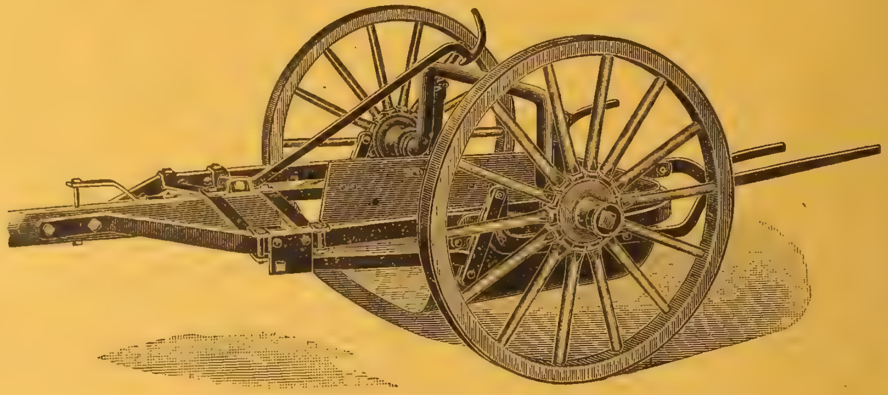
New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

"Kilbourne & Jacobs"
Wheel and Drag
SCRAPERS

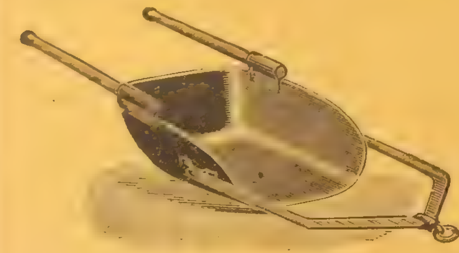
All Capacities in stock All styles Immediate Shipment



New Improved "K & J" Pressed Bowl Wheel Scraper

The only perfect wheelscraper. The best, strongest and easiest working Wheelscraper ever put on the market. The bowl is stamped from one solid plate of wrought Steel, 3/16 in. thick, without joint, seam or rivet. The bottoms of all pressed bowl wheelscrapers are oil tempered. All metal working parts of the best soft steel.

Scrapers are equipped with improved sand-proof wheels with malleable iron hubs and removable axle boxes.



"Columbus" Drag Scraper

This scraper is absolutely seamless throughout, and is the leading scraper everywhere. We guarantee it will work in any kind of soil, whether plowed or not, and enters the ground as readily as a plow.

F.H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

ol. 24 Toronto, October 5, 1910 No. 40

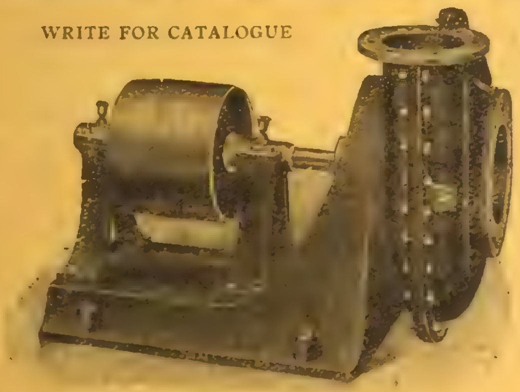
ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE



The Smart-Turner Machine Company
HAMILTON, CANADA Limited

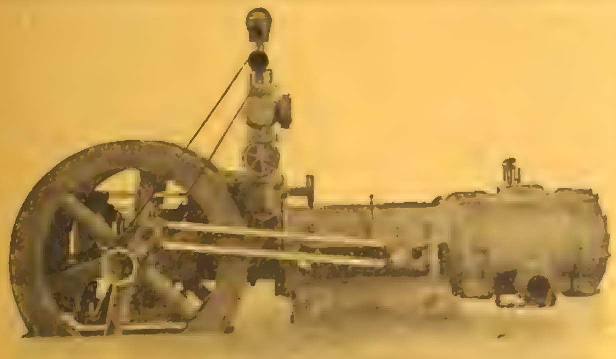
"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

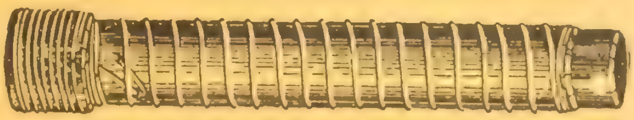


CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity—Efficient Regulation
Large Bearings—Rigid Construction

Ask for Descriptive Catalog K 81

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office:

Montreal

Sales Offices:

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canada Wire Goods Mfg. Co. 56
Dennis Wire & Iron Works. 10

Belting

Federal Engineering & Supplies, Ltd 55

Boilers

Inglis, John 24
Jenckes Machine Co. 2
Leonard & Sons, E. 63
Marsh & Henthorn 55
McDougall Caledonian Iron Works 33
Mussens Limited 34
Taylor-Forbes Co. 57
Waterous Engine Works Co.

Brick

American Enamelled Brick Co. 67
Canadian Pressed Brick Co. 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co.
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co.

Bridges (Steel)

Canadian Bridge Co. 18
Cleveland Bridge Co. 18
Dickson Bridge Works
Dominion Bridge Co. 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware

Taylor-Forbes Co. 57

Cement

Alsen Portland Cement Co. 66
Britnell & Co 57
Bremner, Alex 63
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 64
Rogers, Alfred 4
Rogers Supply Co. 33
Sand and Supplies 59

Conduits Page

Conduits Co., Limited 57

Concrete Mixers and Machinery

Canada Foundry Co. 58
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F. H. 68
Jenckes Machine Co. 2
London Concrete Machinery Co. 23
Mussens Limited 34
Morrison & Co., T. A. 64
Rogers Supply Co. 33

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co. 19
Canada Wire Goods Mfg. Co. 15
Hamilton Iron & Steel Co. 36
Trussed Concrete Steel Co. 5

Contractors' Plant

Beatty & Sons, M. 56
Factory Products Limited 53
Hepburn, John T. 17
H. & E. Lifting Jack Co.
Hopkins & Co., F. H. 68
Katie Foundry Co. 64
Marsh & Henthorn 55
Mussens Limited 34

Crushers (Stone and Rock)

Hopkins & Co., F. H. 68
Jenckes Machine Co. 2
Mussens Limited 34
Morrison & Co., T. A. 64

Corrugated Iron

Galt Art Metal Co.
Metallic Roofing Co. 55
Metal Shingle and Siding Co. 20
Ormsby, A. B., Limited 5
Roofers Supply Co. 63

Contractors Page

McIlwraith, Jas. A. 64

Drills

Beatty & Sons, M 56
Canadian Rand Co. 1

Deafening Felts

Cabot, Samuel, Inc. 59

Drilling Contractors

Harvey, J. 65

Dredges

Beatty & Sons, M 56

Engines

Canadian Boving Co.
Inglis, John 24
Jenckes Machine Co. 2
Leonard & Sons, E. 63
Mussens Limited 34
Waterous Engine Works Co.

Excavators

Harris, J. W. 11

Electrical Apparatus and Supplies

Factory Products Limited 53
Northern Electric & Mfg. Co. 36

Engineers (Civil and Mechanical

Barber & Young 64
Chipman & Power 64
Bowman & Connor 64
Farmer, John T. 64
Fuce, Edw. O. 64
Galt Engineering Co., John 64
Glaubitz, H. J. 64
Hunt & Co., Robt. W. 59
Inglis, John 24
Lea & Ferguson 64
Mace, T. Harry 64
Mitchell, C. H. 64
McRae, John B. 64
Moore & Scollan 64
Nadel & Adler 64

Fire Apparatus Page

Factory Products Limited 5
Morrison & Co., T. A. 64
Seagrave, W. E. 16

Fireproof Doors and Windows

Douglas Bros. 14
Mussens Limited 34
Ormsby, A. B. 5

Granite and Marble

Laurentian Granite Co. 64
Missisquoi Marble Co.
Rogers Supply Co. 33
Smith Marble & Construction Co.

Glass

Chance Brothers & Co. 13
Consolidated Plate Glass Co.
Luxfer Prism Co. 2
Thompson & Co., B. & S. H. 13
Toronto Plate Glass Importing Co. 1

Heating Apparatus

Jenckes Machine Co. 2
Leonard & Sons, E. 63
Taylor-Forbes Co. 57

Hoisting Machinery

Beatty & Sons, M. 56
Factory Products Limited 53
Inglis, John 24
Jenckes Machine Co. 2
Hopkins & Co., F. H. 68
Marsh & Henthorn 55
Mussens Limited 34
Scott Machine Co. 61

Hydrants

Canada Iron Corporation 63
Gartshore-Thompson Pipe Co. 62
Kerr Engine Co.

Lime

Christie, Henderson & Co. 17
Jamieson Lime Co. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

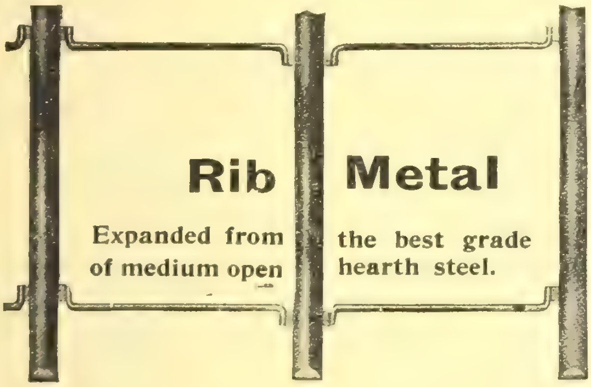
ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.


Rib
Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

From Niagara to the Sea

"October the most beautiful month of the year on the St. Lawrence"

Through the famous 1000 Islands and "Shooting the Rapids" of the St. Lawrence to Montreal, Quebec and the marvelous Saguenay

Via the

RICHELIEU & ONTARIO NAV. CO.

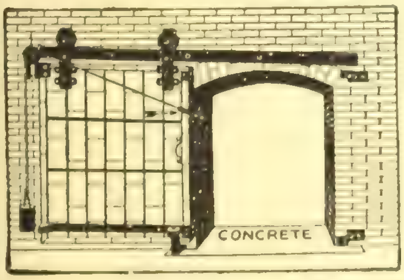
For full Particulars, Rates, Folders, etc. apply

THOMAS HENRY,
Traffic Manager, Montreal

JOS. F. DOLAN,
City Passenger Agent

Some Know, Others Don't Know

That there are two kinds of Fireproof Doors, labelled and unlabelled. Some know, and some don't know that Labelled Doors mean an Insurance reduction 50% greater than unlabelled Doors. Some know, and some don't know, that a Labelled Door is a really Fireproof article, while the other door may or may not be. The only kind to specify to protect your client and customer is Doors with the Underwriters' Stamp on. They are built and supplied by



A. B. ORMSBY, Limited
Experts in Fireproof Windows and Doors
Factories - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish Page

Batts Limited ... 16
[illegible] Lumber Co ... 58
Delaplante, Ltd ... 20
Eaton & Sons, J. R. ... 23
Georgian Bay Shook Mills ... 67
New Liskeard Lumber Co ... 58
Rhodes Curry & Co ... 5
Sanitary Floor Co ... 66
Siemon Bros ... 64
Woodstock Lumber Co. ... 66

Metal Lath

Galt Art Metal ...
Metallic Roofing Co. ... 55
Noble C. W. ... 20

Meters

Hopkins & Co., F. H. ... 68
Neptune Meter Co. ... 56

Paving and Paving Materials

Dominion Carbolineum Works ... 13
Metropolitan Paving Brick Co. ... 58
Ontario Asphalt Block Co. ... 66
Silica Barytic Stone Co., of Ontario.. 65

Plaster

Albert Mfg. Co. ... 57
Britnell & Co ... 57

Pipe

Canadian Pipe Co. ... 62
Dominion Wood Pipe Co. ... 9
Gartshore-Thomson Pipe Co. ... 62
Municipal Construction Co. ... 16
National Iron Works ... 63
Pacific Coast Pipe Co. ... 1

Power Engines

Inglis Co., John ... 24

Paints and Varnishes

Cabot, Samuel, Inc. ... 59
Glidden Varnish Co. ... 36
Paterson Mfg. Co. ... 15

Pile Driving Page

Lincoln Construction Co. ... 16

Pumps and Pumping Machinery

Beatty & Sons, M. ... 56
Goulds Pump Co. ... 58
Hopkins & Co., F. H. ... 68
Inglis Co , John ... 24
Leonard & Sons, E ... 63
Martin Steam Pump Co. ...
McDougall Caledonian Iron Works, John ... 33
Mussens Limited ... 34
Ontario Wind Engine & Pump Co. 61
Smart-Turner Machine Co. ... 1
Waterous Engine Works Co. ...

Roofing Materials

Barrett Mfg. Co. ... 15
Brantford Roofing Co ... 11
Galt Art Metal Co. ...
Metallic Roofing Co. ... 55
Metal Shingle & Siding Co. ... 20
Noble, Clarence W ... 20
Rogers Supply Co. ... 33
Roofers Supply Co. ... 63

Railway Supplies

Factory Products Limited ... 53
Gartshore, John J. ... 64
Hopkins & Co., F. H. ... 68
Mussens Limited ... 34

Road Machinery

American Road Machinery Co. ... 10
Case Threshing Machine Co. ... 62
Climax Road Machine Co. ... 62
Morrison & Co., T. A. ... 64
Mussens Limited ... 34

Sewer Pipe

American Sewer Pipe Co. ... 60
Britnell & Co ... 57
Canada Iron Corporation ... 63
Dominion Sewer Pipe Co. ... 60
Gartshore-Thomson Pipe Co. ... 62
Hamilton & Toronto Sewer Pipe Co. 61
National Iron Works ... 63
Ontario Sewer Pipe Co. ... 14
Rogers Supply Co. ... 33
Standard Drain Pipe Co. ... 60

Sand

Rogers Supply Co. ... 33
Sand & Supplies ... 59

Stone Page

Britnell & Co. ... 57
Christie, Henderson & Co. ... 17
Consolidated Stone Co. ... 20
Contractors' Supply Co. ... 58
Corinthian Stone Co. ... 56
Crushed Stone, Limited ... 59
Doolittle & Wilcox ... 63
Hagersville Contracting Co. ... 5
Laurentian Granite Co. ... 64
Maloney John ... 19
Morrison & Co., T. A. ... 64
Myers, Oakley ... 59
Rogers Supply Co. ... 33
Roman Stone Co ... 17
Sackville Freestone Co. ... 8
Sand and Supplies ... 59

Structural Iron and Steel

Buffalo Steel Co. ... 19
Dominion Bridge Co. ... 18
Eastern Canada Steel Co. ... 21
Hamilton Iron & Steel Co. ... 36
MacKinnon Holmes & Co. ...
Pennsylvania Steel Co. ... 18
Phoenix Bridge & Iron Works ... 19
Queen City Foundry Co. ... 64
Reid & Brown ... 64
Salter, W. H. ... 19

Shovels (Steam)

Beatty & Sons, M. ... 56
Hopkins & Co., F. H. ... 68
Mussens Limited ... 34

Shingle Stains

Cabot, Samuel, Inc. ... 59

Slate

Roofers Supply Co. ... 63

Steel Shingles and Ceilings

Galt Art Metal Co. ...

Smoke Stacks

Leonard & Sons, E. ... 63

Safes and Vaults Page

Taylor, J & J ... 19

Stone Cutters

Bailey-Underwood Co. ... 66

Sheathing Papers

Cabot, Samuel, Inc. ... 59

Telephone Supplies

Northern Electric & Mfg Co ... 36

Tiles

Smith Marble & Construction Co...
Woolliscroft & Son, G. ... 12

Tanks and Stand Pipes

Inglis, John ... 24
Jenckes Machine Co. ... 2
Leonard & Sons, E. ... 63
Marsh & Henthorn ... 55
McDougall Caledonian Iron Works.. 33
Ontario Wind Engine & Pump Co.. 19

Valves

Canada Iron Corporation ... 63
Gartshore-Thomson Pipe Co. ... 62
Kerr Engine Co. ...
Standard Fitting & Valve Co ... 61

Ventilating System

Gardiner & Gaskill ...

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc. ... 59

Wire Rope

Dominion Wire Rope Co. ... 68
Greening Wire Co., B. ... 66
Smith, Thos. & Wm. ... 22

Wire Guards and Screens

Canada Wire Goods Mfg. Co. ... 56

Water Wheels

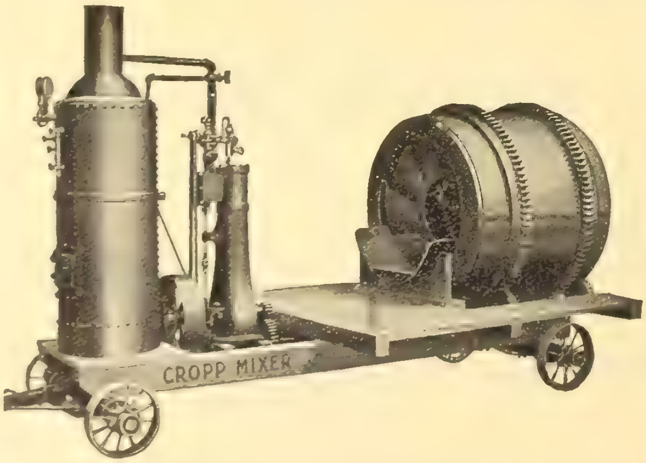
Canadian Boving Co. ...

Wire and Cable

Factory Products Limited ... 53

The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

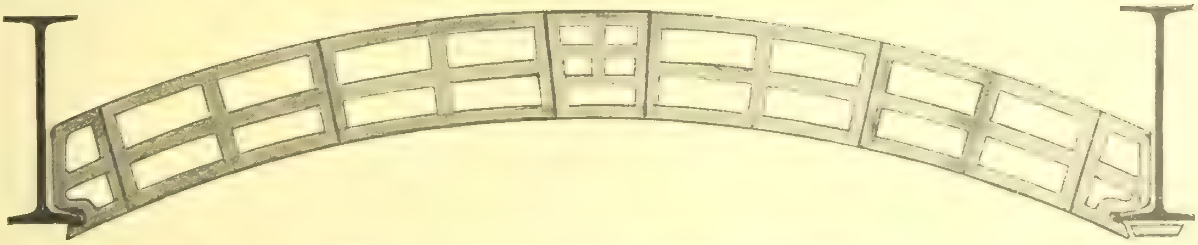
Cropp Concrete Machinery Co., **84 Lasalle Street, Chicago, Ill., U. S. A.**

Nos. 109-11-13 West 18th Street, Kansas City, Mo. **MANNAN SMITH SUPPLY CO., St. Joseph Mo.**

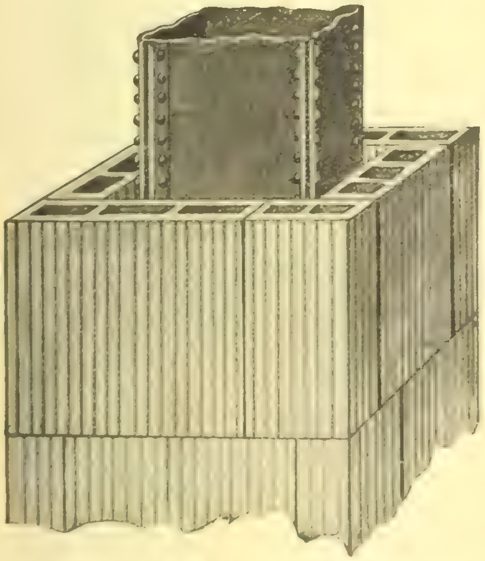
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

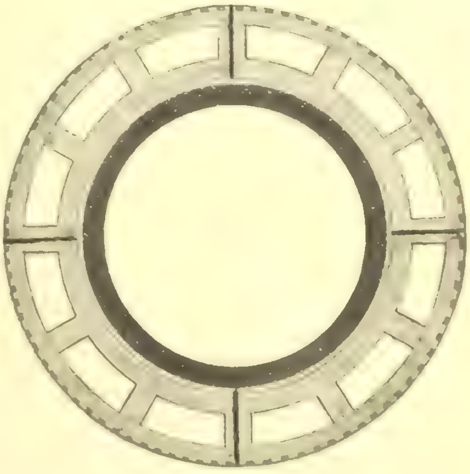


Section showing style of Skewbacks and Keys

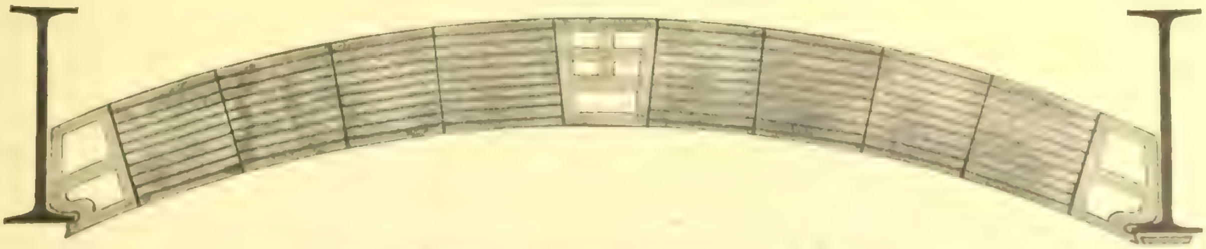


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



Section showing style of Skewbacks and Keys

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Sackville Freestone Co.

Limited

Sackville, N. B.

Weighing the Stone. One day's shipment from the Quarries

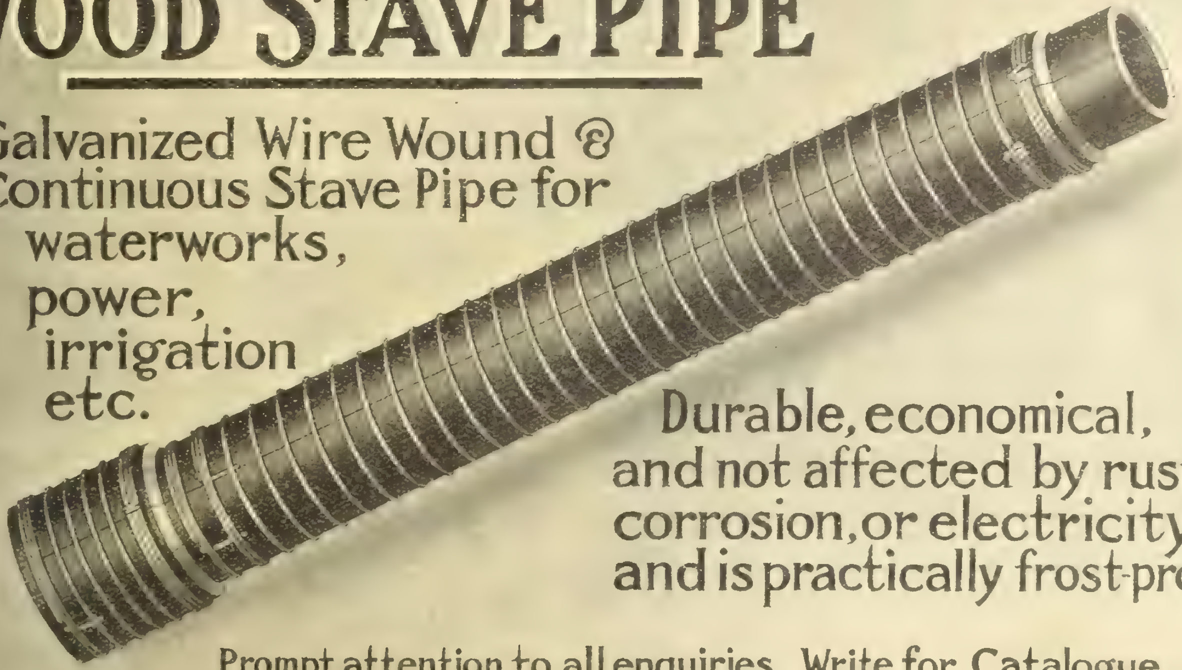
Block Stone
Dimensions
Random

Head Sills
Shoddy
Stone Sawing

Write Us For Quotations

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

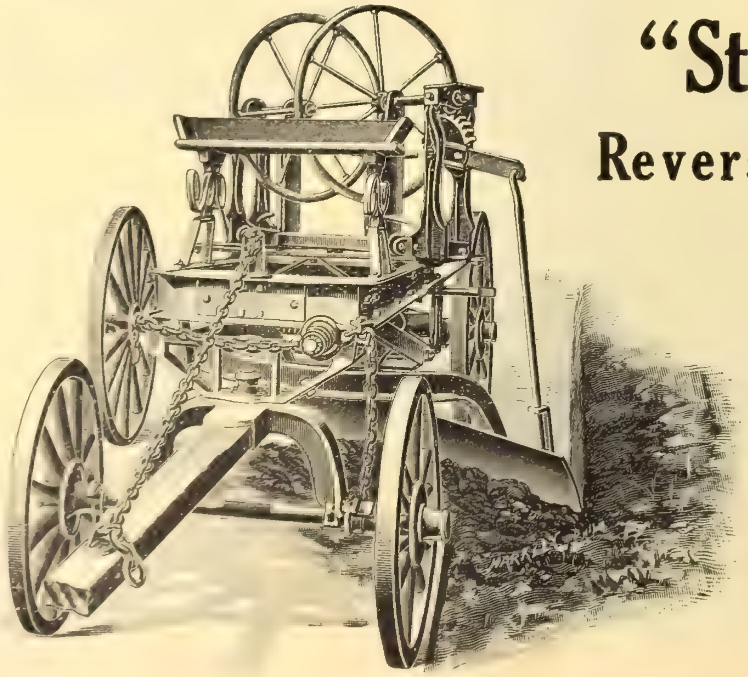
Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

Why Shingle a House when Brantford Roofing is better

Many builders and contractors, who have made a close study and inspection of the different classes of roofing materials on the market, recommend Brantford Roofing for use on dwelling houses as well as on factories and stores.

They do so, because Brantford Roofing makes a neat and attractive appearance on the roof;

Because Brantford Roofing makes a perfectly water tight roof;

Because Brantford Roofing will not melt in summer or turn brittle and crack in winter;

Because Brantford Roofing is fire-resistant;

Because Brantford Roofing is more than TWICE as durable as wooden shingles, yet costs no more.

Send for our big roofing booklet. It gives valuable facts about roofing materials.

Also ask us for samples of Brantford Roofing.

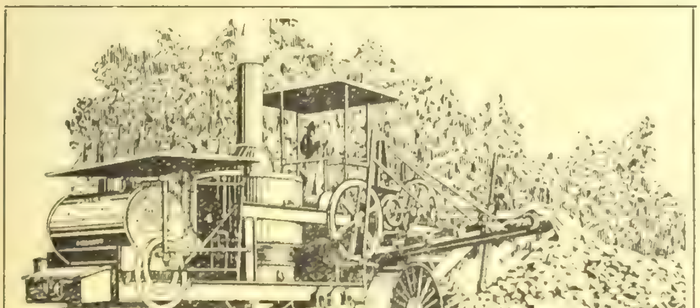
Brantford Roofing Company, Limited

Brantford, Canada

EASTERN AGENTS
Branch Office and Warehouse, Brantford Roofing Co., Limited
9 Place D'Youville, Montreal, Que.
J. S. Mitchell & Company, Sherbrooke, Que.

WESTERN AGENTS
The General Supply Co. of Canada, Limited,
Cor. Market and Louise Sts., - Winnipeg, Man.
Fleck Bros., Limited, Vancouver, B. C.

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

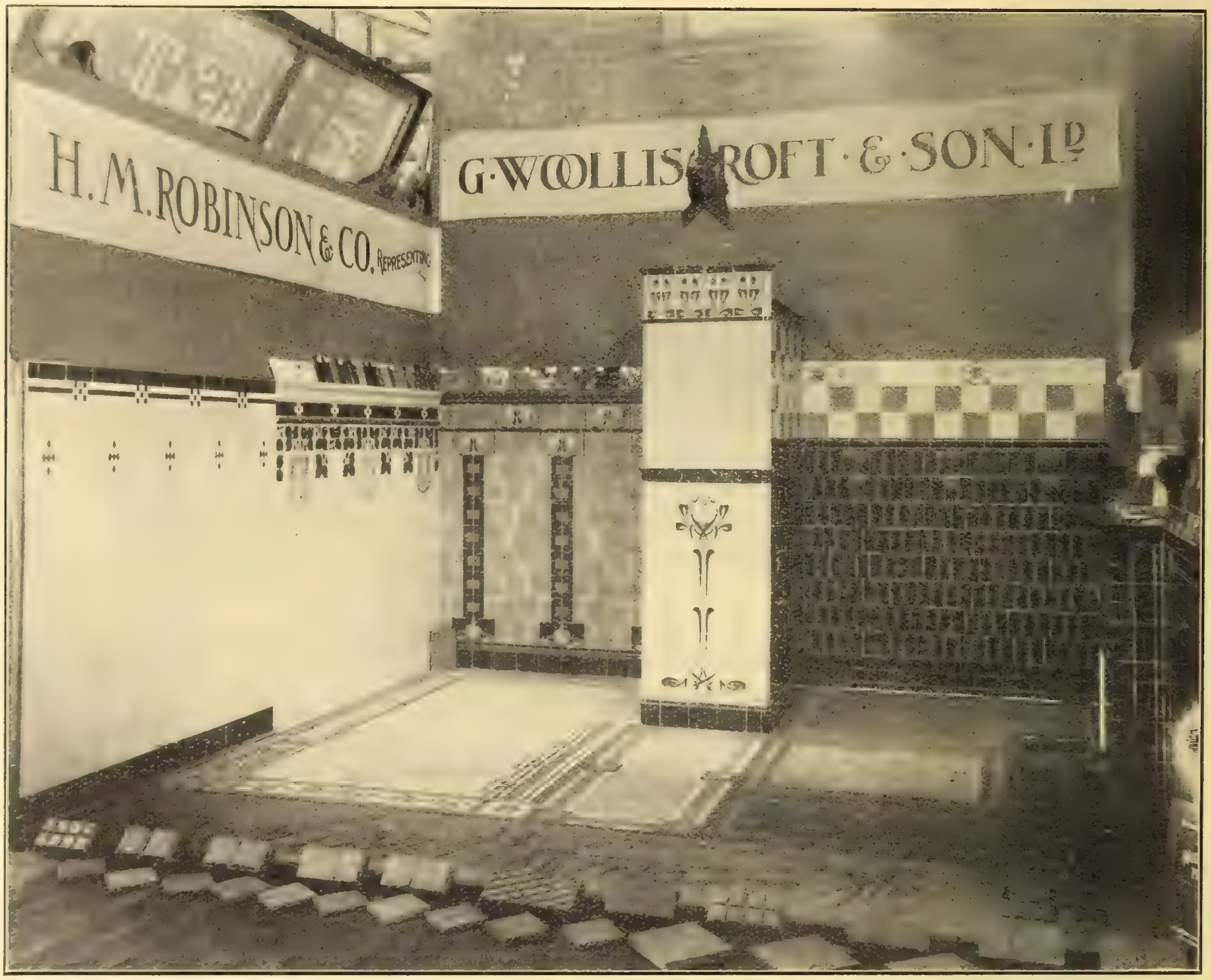
J. W. Harris Mfg. Company, Ltd.

MONTREAL

G. Woolliscroft & Son

Limited

Cables: "BLIZZARD LONDON" **Hanley, Staffordshire, England** Code: A B C 5th Edition



Our Exhibit at the Canadian National Exhibition, Toronto, 1910.

TILES—for Walls, Floors, Ceilings and Roofs.

FAIENCE—Highly Glazed, also in

TERRA COTTA—Red, Buff and Stone Color.

"PENTILICON" or Marble Finish.

"GLOW" FIRES with Tile or Faience Surrounds in Endless Variety of Color and Design to suit all Canadian tastes.

PAVING BLOCKS for **ROADS,** these have beaten the American in the Standard Tests.

Toronto Representatives:

H. M. Robinson & Company, 49 Colborne St.

Chance's
Flemish Glass

A new product of the famous glass works of Chance Bros. & Co., Limited, near Birmingham, England.

"Flemish" is a new and most attractive variety of Ornamental Window Glass, unsurpassed in character and brilliancy. It is particularly effective in the best kinds of Leaded Light work, and for glazing in casements, door panels or interior partitions, where the object is to obscure the vision but not the light.

"Flemish" Glass is made in large and small patterns and in White, Staining White, and numerous Tints.

Chance's Figured Rolled Glass excels in depth and brilliancy of pattern, as well as in easy cutting qualities.

Chance's Double Rolled Cathedral is brighter and more translucent than the ordinary Cathedral, while it costs no more.

To Architects and Contractors we will send on request samples of any of these lines of Chance's Glass. You will find them distinctly superior.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Sewer and Culvert Pipe

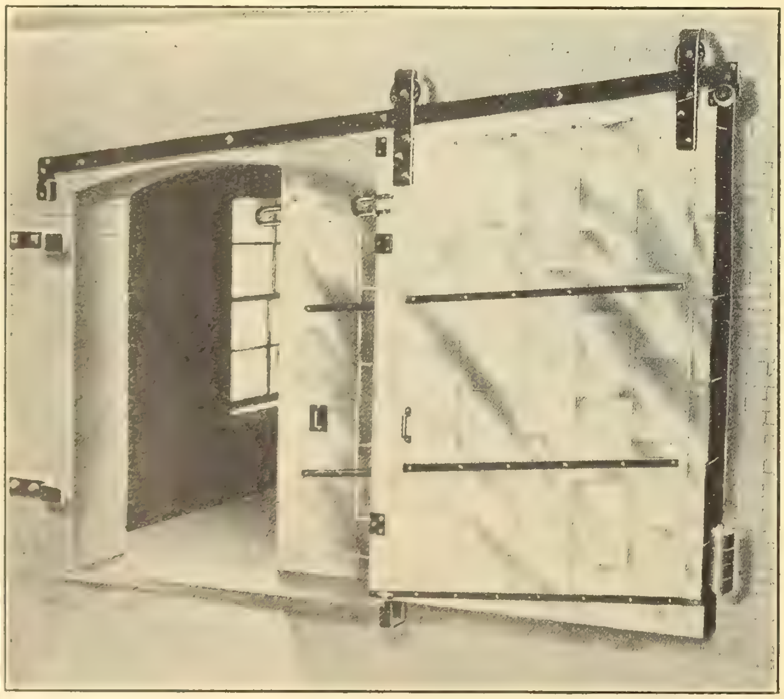
made of

FINE PLASTIC CLAY and WELL BURNED are about as DURABLE as the pyramids. They are the only class of pipe on which the ACIDS and GASES of SEWAGE HAS NO EFFECT. If you want a PERMANENT job and the kind of clay goods that are SURE TO PLEASE, write us for particulars.

Large Stock 4 inch to 24 inch, always on hand.

Telephone Toronto Connection, Parkdale 422.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Barrett Specification Roofs

Largest Sugar Refinery in the World

ANY group of commercial buildings that are described as the "largest in their class" are practically sure to carry Barrett Specification Roofs.

The problems of cost and maintenance of such large areas bring into clear relief the economy of roofs of this type.

A Barrett Specification Roof is made of five alternate layers of "Specification" Tarred Felt cemented with "Specification" Pitch, with a top surface of gravel, slag or tile.

The Barrett Specification prescribes with exactness the correct and practical way of using these materials so as to obtain maximum durability at minimum cost.

The cost per year of service is far lower for these roofs than for any other type, owing to their long life and freedom from painting and other maintenance cost.

The above illustration shows the American Sugar Refinery at New Orleans. It is the largest sugar refinery in the world, costing $4,000,000 with a roof area of about 500,000 square feet.

A Barrett Specification Roof was decided upon because the experience of 25 years which the American Sugar Refinery Co. had with similar roofs, had been most satisfactory, and because they knew that such roofs never needed painting or coating like metal or ready roofings.

Booklet and further information will be sent free on request.

The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

DENNIS-LONDON ORNAMENTAL IRON

The **Dennis Wire & Iron Works Co.**
London, Canada Limited
Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

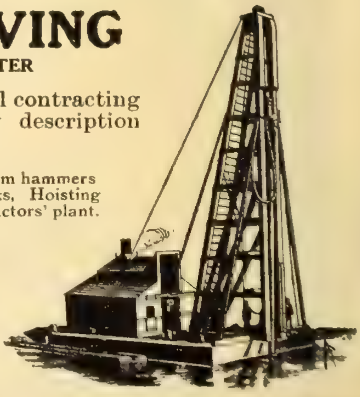
There is a Reason:
The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

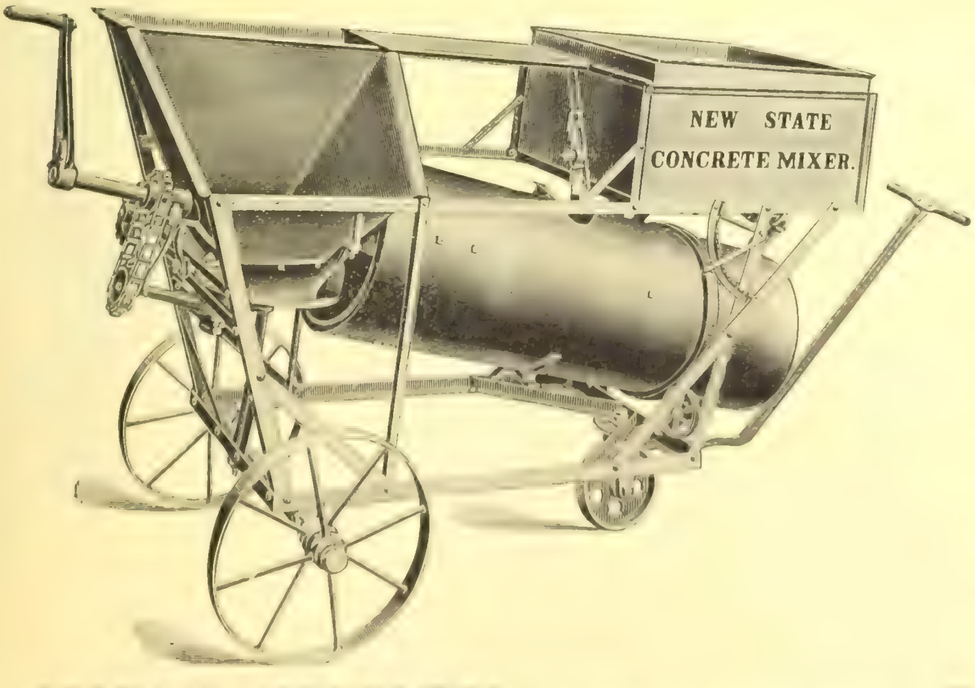
¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

THE NEW STATE CONCRETE MIXER

For mixing sand, gravel, crushed-stone and cement, the handiest machine upon the market



With frame of finest angle steel, hoppers and water tank of heavy galvanized iron, and drum of No. 14 boiler steel, it will stand the hardest reasonable usage. Is simple in construction, may be operated by hand or any kind of power, and mixes perfectly in any proportion from 1 to 2 to 1 to 12.

The low sand hopper effects a big reduction in shovelling labour. And mounted upon 18-inch wheels and a 9-inch truck it is "as handy as a wheelbarrow."

Let us send you quotations
and full particulars

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge
Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway
Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 TORONTO

Branches: Vancouver and Winnipeg

Montreal

The

Phœnix Bridge & Iron Works Limited

MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P [illegible]

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds

(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

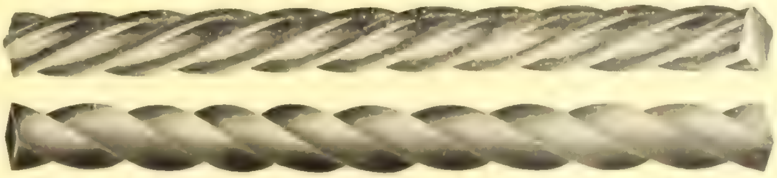
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing. Also [illegible] soft steel rounds.

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. "Suburb of Buffalo N. Y."

Toronto Office
117 Home Life Building

This space is ordinarily used to explain the advantages of

Herringbone Metal Lath

It is useless now. We have been running day and night for several weeks past and the orders are still gaining on us. When our new machinery is installed we will again explain why **Herringbone,** which is not the cheapest metal lath on the market, is such a favorite among close figuring contractors. At present we are merely holding this space.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

PRESTON STEEL SIDING

In cases where dryness, durability, and fireproofness are desired for the most reasonable outlay it is a good policy for a contractor to

RECOMMEND

PRESTON Steel Siding. This material is moisture-proof and wind-proof. As it is made and galvanized according to British Government Specifications its durability is assured. While only costing a fraction of the price of stone or brick, PRESTON Steel Siding is equally handsome, as it is made in patterns which duplicate the appearance of stone and brick. Write us for designs and estimates on any work you may have on hand. We will reply promptly and treat you white.

Metal Shingle & Siding Co., Ltd.
Preston, Ont.
Branch Office and Factory: MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P.Q.

Montreal Office - CORISTINE BUILDING

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C.
ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man.
BAINES & PECKOVER, Toronto, Ont.

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

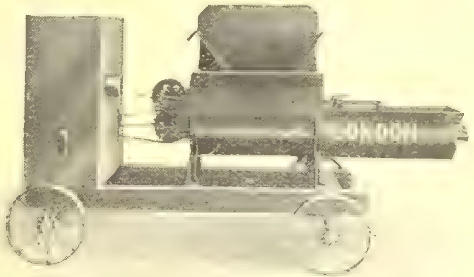
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers



Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money { On the first cost of machine
On cost of operation
On cost of mixing concrete

OUR AUTOMATIC MACHINES do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once **Less men required to operate** Send for catalogue and state capacity desired

We also manufacture a STANDARD DRUM BATCH MIXER in three sizes, one third yard, one-half yard and one yard The most complete Drum Mixer out We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada **Limited**

Manitoba Branch :	Agent for Nova Scotia:	Agent for B. C.
W. H. Rosevear, Agent,	Geo. B. Oland & Co.,	A.G. Brown & Co.,
52½ Princess St.,	28 Bedford Row,	1048 Westminster Ave.,
Winnipeg, Man.	Halifax, N. S.	Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que

We are the Largest Manufacturers of Concrete Machinery in Canada

Hardwood Flooring

"Empire" Quality

Just Rockhard Facts

When you want Maple or Beech Flooring of "Empire" Quality, flooring which has been made from good lumber and has been kiln dried and manufactured properly, and grades which have not been "blended" to meet price competition send us your orders.

Competitive stock bought at a lower price is not a good advertisement to you if it results in a dissatisfied customer who will soon forget the difference in price but he will not forget the poor flooring.

Regardless of price our high standard of quality will not be changed, nor shall we try to fool you by mixing grades.

"Empire" Quality results from good lumber, superior millwork, years of experience, and the most careful and systematic attention to detail exactness.

[illegible]

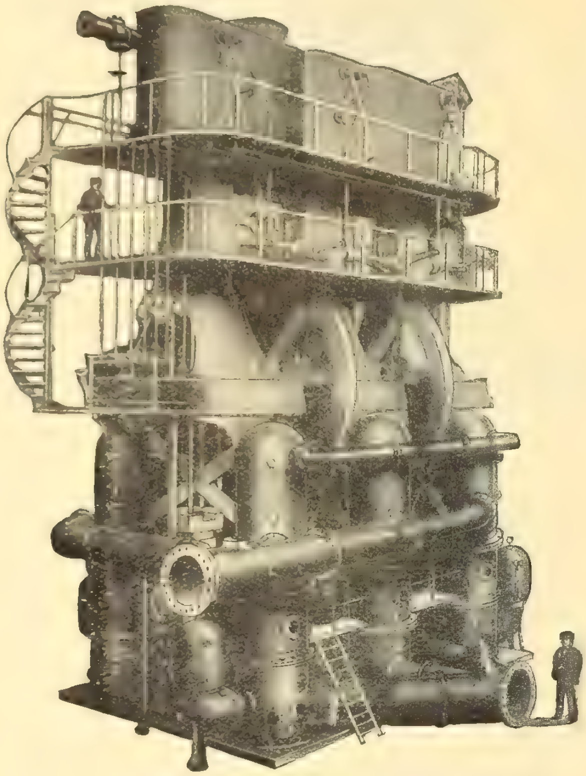
J. R. Eaton & Sons

Limited

Orillia, Ontario

Montreal Agent: [illegible] SPENCER, [illegible]

Waterworks Pumping Plants



CAPACITIES

from one to

15 Million Gallons

Per 24 Hours

Expert unbiased advice gladly given. Let us help you solve your waterworks difficulties ::

The *high economy* attained with **"INGLIS"** Waterworks Pumping Engines is the result of correct design ; careful selection of materials and the highest grade of skilled labor.

We shall be glad to furnish full details of these engines, upon request

The John Inglis Company

ENGINEERS AND BOILERMAKERS **Limited**

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.

The Board of Works have decided to lay a permanent pavement on Front street betwen Victoria avenue and Bridge street.

Burnaby, B.C.

The Ratepayers' Association have appointed a committee composed of three councilors and three members to enquire as to the best kind and quality of water pipe required for the new water system to be installed.

Cornwall, Ont.

Tenders addressed to H. E. Hodgins, tp. clerk, Osnabruck Centre, will be received until October 10th for completion of the Palen creek drainage work. Plans, etc., at office of W. H. Magwood, engineer in charge, this place.

Fernie, B.C.

City Engineer Potter reported that Dr. Fagin, Provincial Health Officer, had advised the installation of a filter bed at the septic tanks. The city engineer will prepare an estimate of the cost.

Montreal, Que.

City Engineer Howard has been instructed to make a report showing the cost of building a huge sewer from a point at the foot of the mountain to Sault aux Recollet, where the city's sewage farm is located.

Another report on widening a large section of the Cote des Neiges road was passed by the council. The cost will be $125,000.

Mr. John Duff and ex-Ald. Sauvegeau were elected by the residents of St. Antoine street to visit the chief American cities to view the paving operations of the Canadian Hassam Paving Company. If report is favorable the Hassam block will be recommended as a suitable paving block for St. Antoine street.

Niagara, Ont.

On October 10th a by-law will be voted on to issue $6,000 5 per cent., 20 instalment waterworks debentures.

Nanaimo, B.C.

Tenders are invited for pipe laying for making drainage connections into sewers. Allan Waters, City Engineer.

Ottawa, Ont.

In order to have an irregularity in Bank street between Billings' bridge and Riverdale road straightened out, City Engineer Ker recommends that a narrow strip of land containing 1,600 square feet be purchased. It is proposed to make the whole thoroughfare uniform in width.

Swift Current, Sask.

Tenders will be received until October 11th for $33,330, 40 year, 5 per cent sewerage disposal works and $71,500 40 year 5 per cent. waterworks debentures. G. W. Bilbrough, secretary-treasurer.

Toronto, Ont.

The College street asphalt block pavement will not be put down this year, as the residents who are opposed to the work have given notice of their intention to appeal against the recent decision of Mr. Justice Clute.

Vancouver, B.C.

The engineer has been instructed to prepare an estimate of the cost of installing lateral sewers to connect with the trunk sewer on Columbia street, Mount Pleasant. These laterals will run both east and west on Tenth avenue; also to estimate the cost of boulevarding the streets between Victoria and Salisbury drives.

Tenders will be called for the resurfacing of Abbott street from Pender street north to the C. P. R. right-of-way. The tender will include the removing of the present asphalt.

Victoria, B. C.

On City Engineer Smith's recommendations work on the repair of the reservoir will start. It will take about two months. Estimated cost, $7,000.

The list of tenders with prices for grading Asquith, Victor, Forbes and Cecil streets and constructing permanent walks were as follows: Cecil street — City Engineer, $7,834.50; Pacific Coast Construction Company, 38.25 and 18 cents, $6,421.15; Hugh McDonald, $8,665.00. Asquith street — City Engineer, 70 and 20 cents, $9,606.80; Pacific Coast Construction Company, 69.93 and 18 cents, $9,286.80; Hugh McDonald, $10,455.00. Forbes street—City Engineer, 50 and 20 cents, $7,850.00; Pacific Coast Construction Company, 38.23 and 18 cents, $6,433.00; Hugh McDonald, $8,655.00. Victor street — City Engineer, 55 and 20 cents, $8,040.50; Pacific Coast Construction Company, 57.80 and 18 cents, $7,780.90; Hugh McDonald, $8,205.00.

Wynyard, Sask.

The council are inviting tenders for sidewalks and their construction will complete the walks in the business portion of the town.

Winnipeg, Man.

Tenders were called for work in local improvements amounting to over $22,000, and the city clerk received instructions to advertise the city's intention to do further works involving an expenditure of over $84,000.

AWARDED.

Blairmore, Alta.

The council has let the contract for the installation of a waterworks system to W. J. Budd, of Blairmore. The water will be taken from Wolf Creek at a point about two miles distant and will be brought to the village in 12-inch wire wound wooden pipes.

Hamilton, Ont.

E. Caroll, this city, was given the contract for sewer construction on Ravenscliffe avenue at 90 cents per foot and [illegible] cents per foot on Grey street. J. T. Armstrong, this city, has the contract for Glenside avenue at 90 cents, and Flatt avenue at 97 cents.

Montreal, Que.

The contract for construction of new intake at Point St. Charles, has been awarded to Lemoine & Desy by the council, $155,000.

Port Arthur, Ont.

Contract for excavating and refilling of trench for sewer and water mains was let to K. Justin at 58 cents per cubic yard for earth, and $3.50 per cubic yard for rock. Other prices, 80 cents per cubic yard for earth and $4.50 for rock.

Prince Albert, Sask.

The tenders for the filtration plant were as follows: One at $14,000, another at $11,000, and Wm. Knox's tender at $6,985 (accepted).

Winnipeg, Man.

The tender of the Canada Iron Corporation for the supply of 10,000 feet of six-inch water main was accepted by the board of control. The price is $57.50 per ton, wihch is much lower than that quoted in the next lowest tender.

Railroads, Bridges and Wharves

Bonaventure River, Que.

Tenders are being called until October 26th by Public Works Department, Ottawa, for construction of extension to training pier here. R. C. Desrochers, secretary.

Calgary, Alta.

Tenders will be received by W. D. Spence, city clerk, up to November 7th, for the erection of steel bridges, one across the Elbow river at 12th avenue and the other across the Elbow river at Second street east. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Tenders will be received by W. D. Spence, city clerk, up to November 7th for the supplying to the city, rails, cars, equipment and overhead material for extensions to the municipal street railways. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Luke Superior Junction, Ont.

Tenders addressed to P. E. Ryan, secretary, Commisisoners of the Transcontinental Railway, Ottawa, will be received until October 18th for the machinery required for the equipment of roundhouse here. Plans, etc., at office of Mr. G. Grant, chief engineer, Ottawa, and of Mr. S. R. Poulin, district engineer, St. Boniface, Man.

Ottawa, Ont.

The residents of Ottawa South will petition the Government for a high leevl bridge on Bank street over the canal. Hon. G. P. Graham, Minister of Railways & Canals.

The following firms submitted tenders on the Quebec bridge: The Dominion Bridge Company of Montreal, the Canadian Bridge Company of Walkerville, the British Empire Bridge Company (representing the amalgamated interests of two large British companies, with works at Darlington and Birmingham), and the Phoenix Bridge Company of Phoenixville, Pa., which had the original contract for the bridge.

Roberval, Que.
Mr. Dubuc, of Chicoutimi; Col. B. A. [illegible], and others, intend to apply for a charter to build a line of railway from Roberval to the Peribonca, and thence by the north shore of Lake St. John to a deep water port on the Saguenay. The large projected pulp industries give rise, it is said, to the demand for railway communication in the district in question.

St. Joseph De Sorel, Que.
Tenders will be received until October 17th for the construction of a landing pier. R. C. Desrochers, secretary, Department of Public Works, Ottawa.

St. Andrews, Que.
Tenders are being called by Public Works Department, Ottawa, for construction of wharf here. R. C. Desrochers, secretary.

Trail, B.C.
It is expected that concrete foundations for the piers for the bridge acros sthe Columbia here will be put in this winter. J. E. Griffiths, provincial government engineer, has been here in regard to the work being rushed ahead.

Toronto, Ont.
The city council will consider the connecting of Parliament street with the proposed Bloor street viaduct. On motion of Ald. O'Neill, the City Engineer was asked to report an estimate as to the cost, and the Assessment Commissioner to estimate the land damages.

Union Bay, B.C.
Tenders addressed to H. E. Beasley, superintendent, will be received until November 1st for clearing of right-of-way o. the Comox extension, E. & N. R., between Parkerville and Union Bay. Specifications at office of division engineer, Victoria.

Winnipeg, Man.
The wharf at the foot of Blanchard St. on the Assiniboine river has been condemned.

Tenders addressed to P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, Ottawa, will be received until October 18 for the centrifugal pumps and motors required for the sewage pumphouse at the shops here. Plans, etc., at office of Mr. G. Grant, chief engineer, Ottawa, and of Mr. S. R .Poulin, district engineer, St. Boniface, Man.

Tenders will be received by P. E. Ryan, secretary Commissioners, Transcontinental Railway, up to the 18th day of October, for the machinery required for the equipment of a round house at Lake Superior Junction, Ont., and for centrifugal pumps and motors required for the sewage pump house at the Winnipeg shops, Winnipeg, Man., For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

AWARDED.

Edmonton, Alta.
The contract for the steel bridge over the Groat ravine was let to the Dominion Bridge Company, $52,000.

Victoria, B.C.
Contract for the extension of E. & N. Railroad from Duncan to Cowichan has been awarded to the firm of Janse, Macdonnell & Timothy.

Public Buildings, Churches, Schools, etc.

Babcock, Man.
Tenders addressed to A. W. Gordon, secretary- treasurer, were received until Oct. 3rd for erection of school building for Leary's S. D. No. 1540.

Brantford, Ont.
The committee in charge of securing a site for the new Thomson memorial home will decide on the location of the new home. Several fine sites are under consideration.

Castor, Alta.
The board of trustees, S.D. No. 2194, have been authorized to borrow $20,000 to purchase land and erect a school. R. C. Murphy, Sec., Castor, Alta.

Campbellton, N.B.
The Department of Public Works, Ottawa, is calling for tenders until Oct. 18th for construction of public building here. R C. Desrochers, secretary.

Edmonton, Alta.
Official word has been received by Col. E. B. Edwards that the armory there will be constructed at a cost of not less than $100,000 when the suitable site has been procured.

The final steps in the purchase of the site for the new residence for Lieut.-Governor in Glenora have been taken.

Erieau, Ont.
Tenders are wanted for the new English church here. Plans at E. H. Spackman's, Blenheim.

Goderich, Ont.
Tenders are being called by Public Works Department, Ottawa, until October 24th for erection of public building here. Plans at public building here and at office of H. J. Lamb, district engineer, London. R. C. Desrochers, secretary.

Hartland, N.B.
Tenders are being called until October 19th for the erection of public building here by the Department of Public Works, Ottawa. R. C. Desrochers, secretary.

Harris, Sask.
The board of trustees, S.D. No. 2498 has been authorized to borrow $10,000 to erect a school house.

London, Ont.
Tenders will be received until October 10th by T. A. Robinson, The Grove, for the painting and kalsomining of The Grove Church. For further particulars apply to S. G. Tackabury, or G. Smith.

Moose Jaw, Sask.
Tenders were called until October 3rd for erection of curling rink here. Plans at office of Jas. Thompson, this city; Storey & Van Egmond, architects, Regina.

Tenders are being called until Oct. 10th for erection of Saskatchewan College Buildings. Plans, etc., at office of R. G. Bunyard, architect, this city, or with J. D. Atchison, architect, Winnipeg, Man.

Moncton, N.B.
The Department of Public Works, Ottawa, is calling for tenders until October 17th for additions and alterations to the public building here. R. C. Desrochers, secretary.

Mimico, Ont.
At a meeting of the Board of Management of the Mimico Industrial School, the enlargement of the school was discussed.

Montreal, Que.
Messrs. Marchand & Haskell, architects, 164 St. James street, are preparing plans and specifications for the remodelling of the Emergency Hospital, same to include new drainage, plumbing and heating, for the city.

A committee has been appointed by the Engineers' Club to confer with the architects regarding the preparation of plans for an extension of the club's present building in Beaver Hall Square.

Tenders were called until Oct. 3rd for the furniture in connection with the Montreal Technical School. Plans, etc., at office of the architect, J. S. Archibald, 59 Beaver Hall Hill. A Ayer, chairman of the committee.

The request of Mr. C. A. Beggar, of the Department of the Interior, for permission to construct a tower 40 x 16 on Mount Royal to be used by the Geodetic Service of Canada has been referred to the Legal Department.

Until October 17th tenders are being asked for $350,000 4 p.c. 30 year school debentures. C. J. Binmore, Treas., 197 Peel St., Montreal.

Nelson, B.C.
Active steps are being taken by this municipality towards the erection of a suitable memorial to the late John Houston, its founder.

Ottawa, Ont.
The Board of Control has recommended to the city council the acceptance of the tender of Laurie & Lamb for the Heenan-Froude incinerator at a cost of $34,650.

An incinerator of Heenan-Froude construction will be recommended by the committee, which is composed of Mayor Hopewell, Controller Davidson and City Engineer Ker. The offer to install the Heelan-Froude plant was found to be the lowest. It is understood the cost will be about $34.000. The plant is similar to the one in Westmount, Que., and to the destructor in Seattle, and is to be erected this fall on the site of 16 acres which has been acquired near Hurdman's bridge.

The plans for Bethany Presbyterian Church, prepared by J. A. Ewart, have been adopted, and tenders will be called for the excavation and foundation.

The plans for the Rivermead Golf Club house have been prepared by Weeks & Keefer. The present farmhouse on the site will be used in the new building. Estimated cost, $7,000.

Horwood, Taylor & Horwood, architects, are calling for tenders for constructing a tennis court and basket ball court at Carleton school.

Regina, Sask.
No plan has been chosen from the competitive plans submitted for the library building here. T. R. Honeyman, secretary.

Sudbury, Ont.
The Palace roller rink was destroyed by fire on the 27th ult. Estimated loss, $15,000.

Strathcona, Alta.
Tenders are being called by Public Works Department, Ottawa, until October 24th for construction of public building here. Plans, etc., at office of Mr. J. Greenfield, resident architect, Winnipeg, Man.; W. T. Mollard, clerk of works, Regina, at local post office and at above department. D. C. Desrochers, secretary.

Sherbrooke, Que.
The Redemptorist Fathers, of Ste. Anne, Que., have purchased land on Ontario St. for the purpose of erecting a large church and monastery.

St. John, N.B.
Tenders are being called by Public Works Department, Ottawa, until October 24th, for construction of warehouse No. 7

and extension of warehouse No. 6 on St. John Harbor. R. C. Desrochers, secretary.

Three Rivers, Que.

The city hall was partly destroyed by fire on the 2nd inst.

Toronto, Ont.

The governors of Trinity College have authorized the erection of new rink and preparation of plans. Estimated cost, $8,000.

The Ontario Club have secured option for 30 days on the stone structure, corner Wellington and Jordan streets as a probable future home for their club when they have to leave their present quarters on Bay street.

The Macedonians of this city have organized and a committee has been appointed to select a site for new church. Mr. Kosma Demalkoff, chairman, and M. G. Arsoff, 652 Landsdowne avenue, secretary. Estimated expenditure, $5,000.

Tenders for the power house, the private patients' wing, the nurses' residence, and the obstetric building for the General Hospital are to be asked for later.

Tenders are called until October 5th on behalf of the Y.M.C.A. for removal and woodwork, plumbing, and heating apparatus of the house corner of College and Dovercourt Road. Burke, Horwood & White, architects, 28 Toronto street.

Tenders will be received by Symons & Rae, architects, up to October 8th, for the various works required in the erection of a Sunday school building for the Chester Presbyterian Church. For further particulars see advertisement in "Tenders and For Sale Department" in this issue.

Victoria, B.C.

A permit was issued to the Grace Lutheran Church board for a one-storey frame church at Queen's avenue and Blanchard street, $6,000.

Another proposition for a new theatre is before the city in the shape of a letter signed by Charles Frohman and Klaw & Erlanger per Marc Klaw offering to subscribe $10,000 to a $125,000 fund raised by the city, and to take a ten years' lease of the theatre, etc. Mr Simon Leiser has asked the city council to assist.

Vancouver, B.C.

The University Commissioners have selected the vicinity of Vancouver as the locality for the Provincial University.

Vancouver is to have a Buddhist temple. Five thousand Japanese have planned a $25,000 structure. The building inspector has approved the plans. Plans prepared by Architect Archer.

Donnellan Brothers are the architects for the proposed building to be erected by the Fraternal Order of Eagles, on the west side of Homer street between Pender and Dunsmuir.

The congregation of St. Paul's Anglican Church have decided to build the parish hall and rectory. Provisional cost, $13,000. Rector, F. A. P. Chadwick; F. W. Sterling, H. Newmarch and others, building committee.

Tenders are being called by Department of Public Works, Ottawa, until Oct. 26th for construction of examining warehouse here. Mr. J. Greenfield, resident architect, Winnipeg, Man.; W. Henderson, resident architect, Victoria. R. C. Desrochers, secretary.

The plans for the new isolated hospital on the Admiralty reserve, on the North Arm of the inlet, as prepared by Dalton & Eveleigh, have been approved by the health committee. Dr. Underhill, medical health officer, has received instructions to call for tenders as soon as the specifications have been made out. The estimated cost of the three structures comprising the hospitals is $45,000 for frame structures and $60,000 for brick buildings.

Mr. Marc Klaw, of the theatrical firm of Klaw & Erlanger, is expected here to look over the theatrical field with a view, it is said, of establishing a theatre in Vancouver.

Wiarton, Ont.

Tenders are being called by the Department of Indian Affairs, Ottawa, until Oct. 10th for erection of stone school on the Cape Croker Indian Reserve. J. D. Mc Lean, secretary.

Winnipeg, Man.

Tenders were called until Oct. 2nd for excavation, masonry, brick work and drains required in the foundations for Country Club building at St. Charles. J. E. Botterell, secretary.

AWARDED.

Brandon, Man.

The contract for the electric fixtures for the new convent, and St. Michael's Academy, has been let to H. T .Broughall Electric Company, of this city.

Carleton Place, Ont.

Plans have been prepared by Mr. C. J. Burritt, architect, Ottawa, for the 2 storey Masonic Temple here. Plans call for brick with stone trimmings, 51 x 74 feet. Contractors for foundation are P. McGregor and A. Coles. Contract for the superstructure has not yet been signed.

Erickson, B.C.

Messrs. Hendren & Payne have been awarded the contract for the erection of the public school at Erickson.

Montreal, Que.

General contract for the erection of a one storey addition to the Children's Memorial Hospital, Cedar avenue, has been awarded to the Atlas Construction Company, Guy Block. Architects, Brown & Vallance, Canada Life Building. Price $11,000.

Contract for the ornamental iron work in connection with the erection of the new William Dawson school for the Protestant School Commissioners, has been awarded to Messrs. John Watson & Son, Limited, 167 Wellington Street. General contractors, Gray & Wighton. Architect, A. F. Dunlop, Lindsay Building.

The St. Denis Catholic School Commissioners are making alterations to school building at 210 Laurier avenue. Price, $2,000. General contractor, E. Dore, 1245 Berri street. Architect, E. J. P. Courval, 714 Laval avenue.

Niagara Falls, Ont.

The contract for the new armory in this city has been awarded to Alonzo B. Robertson of this city at $44,050, the lowest. The next lowest was $46,000, and the highest $81,000. There were 52 bidders, and the armory will be completed July 1st, 1911.

Toronto, Ont.

R. Robertson & Sons have the contract for the pathological building, corner of University and Christopher streets, in connection with the General Hospital. J. & T. Thompson are the contractors for the [illegible] building.

Accepted tenders for Annette Street school are as follows: Masonry, J. C. Baylis & Son, $28,700; carpentry, Crocker & Le Drew, $8,700; plasterers, George White, $2,580; painting, J. Faircloth & Company, $785; steam heating, Fred Armstrong & Co., $8,200; heat regulators, Johnston Temperature Regulating Co., $400; structural steel, W. H. Salter, $2,540; roofing and sheet metal work, Reggin & Spence, $914; terra cotta flooring, R. Burnett, $3,240; plumbing, Fred. Armstrong & Co., $1,534; electric wiring, Geo. A. Beattie, $80; total, $57,693.

The McMurrich School accepted tenders are as follows: Masonry, J. C. Baylis & Son, $23,200; carpentry, Crocker & Le Drew, $11,300; plasterers, Blackburn & Son, $2,550; painting, J. Faircloth & Co., $1,245; heating and ventilation, Keith & Fitzsimons, $4,913; plumbing, Fred Armstrong & Co., $1,318; heating regulators, Johnston Temperature Regulating Co., $670; structural steel, Reid & Brown, $3,109; roofing and tinsmithing, J. G. Flowers, $898; terra cotta flooring, James A. Wickett, $2,657; electric wiring, George A. Beattie, $60; total, $51,900. The erection of a two-room portable school in the south playground at Hillcrest school was recommended.

Westmount, Que.

Messrs. Ross & McFarlane, architects, 1 Belmont street, have awarded the contracts for the excavations, masonry and brickwork in connection with the erection of the two branch buildings for the Young Men's Christian Association on Fairmount avenue, Outremont, and Arlington and Sherbrooke streets, Westmount, to Messrs. John Stewart & Company, general contractors, 1 Bethune avenue, Westmount.

Residences

Edmonton, Alta.

Building permits were issued to J. L. Conover for a dwelling on Jasper avenue west, $3,000; to J. Goldsbury, for a dwelling on Kirkness street, $2,000.

Hull, Que.

Mr. W. A. Cole has purchased 141 lots on the Walker property, Wrightville, in the city of Hull, and will build 100 cottages on this property.

Montreal, Que.

An application has been made by Mr. A. J. H. Denis, to the Westmount City Council for permission to erect an apartment house.

Ottawa, Ont.

Among the recent building permits were: Nimmo & Soper, dwelling, First avenue, $[illegible],950; A. & R. McArthur, Woodlawn avenue, dwelling, $3,000; W. R. Smith, Sunnyside avenue, $3,600; Nimmo & Soper, dwelling, Carling avenue, $4,200; J. M. Taylor, dwelling, Third avenue, $4,000.

Sydney, N.S.

A permit has been issued to contractor S. H. Stevenson for the erection of a dwelling for the congregation of Jubilee Methodist Church, on Dorchester street. Cost, $6,000.

Victoria, B.C.

A permit was issued to A. E. Robertson for dwelling on Elford street, $1,500.

Winnipeg, Man.

M. Krolik, of the Burridge-Cooper Co., of Winnipeg, has purchased property in Tuxedo Park. On [illegible] Boulevard he will erect next year a handsome residence, to cost about $12,000.

The following building permits have been recently issued: G. W. Ferguson, house, south side of Maplewood, $1,200; F. D. Burns, two houses, north side of Morley, $1,000; J. [illegible] [illegible] Works, addition to factory on Winnipeg avenue, $[illegible]; Mrs. W. J. [illegible] west side of Home, $3,800; P. MacDiarmid, two houses, west side of Walnut, $7,000; A. C. Galbraith, house, west side of Basswood Place, $[illegible]. A. Simpson, house, northeast corner of Home and [illegible], $4,000.

AWARDED.

Montreal, Que.

T. R. Wilson is erecting thirteen houses on Cowan street to cost $32,000. General contractors, H. Plante & Company, 924 Huntley street.

Messrs. Hogle & Davis, architects, 80 St. Francois Xavier street, have awarded the general contract for the erection of an apartment house on Summerhill avenue for Mrs. M. Davis, to Messrs. John Stowart & Company, general contractors, 1 Bethune avenue, Westmount. Price, $24,000.

The Masson Estate are making alterations to property at 342 St. Catherine St. west. Price, $1,500. General contractor, D. M. Long, 39 Windsor street. Architects, Finley & Spence, 46 Beaver Hall Hill.

Mr. J. B. Drapeau is erecting a two storey house on St. Hubert street. Price $5,500. General contractor, D. Dupras, 407 Maisonneuve street. Architect, Jos. Art. Godin, 299 St. Denis street.

Mr. E. Payette, architect, 15 St. James street, has awarded the contract for alterations to property on Dorion street for the Masson Estate to Picard, Valin & Co., contractors, Bordeaux. Price, $4,000.

Ottawa, Ont.

The contracts for the construction of a residence for Hon. Sidney Fisher have been awarded as follows: Felix McCullough, masonry; W. G. Adamson, carpenter work; J. Sutherland, plastering; J. Storr, painting. C. P. Meredith, architect.

Victoria, B.C.

Hayward & Dods, Fort street, have been awarded the contract for the plumbing and heating installation in the Mount Edward Apartments, corner Vancouver and Coutts streets. The contract calls for its completion by January.

Business Buildings and Industrial Plants

Amherst, N.S.

The business block occupied by D. M. Ferguson and A. J. Crease, druggist, was badly gutted by fire on the 2nd inst. Estimated total damage, about $20,000.

Berlin, Ont.

Negotiations are in progress by Mr. W. McDougall for a site for a two-storey cement block to be used as a planing mill

Canford, B.C.

A new sawmill with a daily capacity of 40,000 feet and modern machinery is to be erected here. Estimated cost, $25,000.

Digby, N.S.

It is understood that the C. P. R. is contemplating the erection of a hotel here on Battery Point.

Edmonton. Alta.

The C. P. R. are planning to erect next spring a large terminal station here.

Grand Valley, Ont.

J. McIntyre & Sons, in the recent fire here, which destroyed their business block, estimate their loss at about $4,000; Wm. McIntyre at $3,500; G. A. Davey, $4,000.

Goderich, Ont.

The building, plant and stock of the Goderich Organ Company was destroyed by fire on the 2nd inst. Estimated loss, $100,000. Local manager, A. Saunders. It is stated the mill will be rebuilt at once.

High Falls, Ont.

J. B. McRae has been chosen engineer for the timber sheds at High Falls, to be built for the Jas. MacLaren Lumber Co.

Hamilton, Ont.

Permits were given to the Oliver Chilled Plough Works, $30,000; to A. W. Peene, for warehouse, $14,000.

The Canada Steel Company, Limited, will erect, at once, their mill on the west side of Sherman avenue, between the main line of the G. T. R. and the spur line of the T. H. & B. R. The plans, originally prepared by a Pittsburg firm of engineers, are in the hands of Munro & Meade, architects, of this city. They include the erection of a steel mill, 250 feet by 70 feet; also stock sheds and machine shop. Tenders will be called within the next week and work will start immediately. The mill will be of corrugated iron, structural iron and concrete construction. W. W. Currie, this city, general manager; temporary office, corner of Main and Hughson streets. Commissioner of Industries, W. Mulliss.

Iroquois, Ont.

Two large warehouses belonging to A. J. Ross, of the firm of Ross Bros., were totally destroyed by fire on the 20th ulto. Estimated loss, $3,000.

Medicine Hat, Alta.

The Bank of Montreal will commence erecting a building in Medicine Hat the middle of next month.

Milton, Ont.

The contractors are working on the erection of power house and wire-drawing building for P. L. Robertson Company. The main building, 300 feet frontage, will be erected next year.

Merrickville, Ont.

The Percival Plow & Stove Co. was damaged to the extent of $10,000 on the 2nd inst.

Macleod, Alta.

A. E. Hoare, of England, managing director of the Bank of British North America, has conducted negotiations for the purchase of a site on Main street, Macleod. A new bank building will be erected at a cost reported at $25,000.

Montreal, Que.

St. Lawrence Milling Company, Limited, 1110 Notre Dame street west, has a permit for flour mill, $77,000.

The Montreal Taxicab Company have purchased the Victoria rink and property on Drummond street, close to the Windsor hotel, and will use the same as a garage. Extensive alterations and improvements will be made to the inside of the building to suit requirements. Messrs. Duncan McDonald, R. Forget Louis Boyer, K.C., L.N., Patenaude and Dr, Simard, control the company.

The old Y. M. C. A. building at the corner of Craig and Victoria Square, the property of the Shedden Forwarding Company, Limited, has been condemned by the city inspector, and the company will have the building replaced by a modern structure.

Newmarket, Ont.

The Office Specialty Manufacturing Company purpose erecting at once a large four-storey factory building adjoining their present plant here. Tenders close October 20th. For further particulars see "Tenders and For Sale Department" of this issue. O. E. Tench, architect.

Nanaimo, B.C.

A new industry will be established here by the Red Cliff Brick & Tile Company, Limited, for the purpose of exploiting shale beds at East Wellington, near here. It is estimated that material sufficient to turn out about 300,000 bricks each day is available for some time to come.

New Westminster, B.C.

The Maple Grove Lumber Company's sawmill near Clayburn was destroyed by fire recently at a loss of about $10,000.

New Glasgow, N.S.

St. George's Church, it is understood, will erect a new structure in the spring to cost about $10,000.

Ottawa, Ont.

A. Cherpentier will erect a seven tenement, brick veneer building on Main St. this fall.

K. Cohen and A. Levison will erect a commercial building on Somerset street. It will be brick, have three stores, and be three storeys. The upper storeys will be for apartments. Jas. Mather, architect.

I. Sugarman will entirely remodel three stores he recently purchased on Wellington street.

A construction permit for a solid brick building to be erected at the corner of Rideau and Mosgrove streets has been issued to the Geo. Matthews Company. Alexander, Campbell & Richards, contractors; W. E. Noffke, architect. $20,000.

Perth, Ont.

The site has been selected for the Winn Shoe factory on the corner of Sherbrooke and Herriott streets. Mr. W. J. Rabb will excavate. Tenders will be called shortly for superstructure.

Peterborough, Ont.

Permit was issued recently to Peterborough Canoe Company for factory, $7,000.

Princeton, Ont.

The Bank of Hamilton branch is being built by W. H. Wells, this place, and will be one storey, brick, 40 by 30 feet. Chas. Mills, Hamilton, architect.

Quebec, Que.

Messrs. Holt, Renfrew & Company, this city, will have their factory here extended. Mr. W. C. Cooke, manager, Montreal branch.

The Canada Paper & Pulp Company have among their future projects a large plant for the manufacture of paper, pulp and carbide on the Saguenay river, near Lake St. John. Capitalization, $10,000,000.

Rivers, Man.

Mr. P. Cook, formerly of Portage la Prairie, will erect a hotel here.

Regina, Sask.

In the recent fire the store, warehouse, etc., of Mr. Backmann were destroyed at a total loss of about $12,000. It is understood that he will rebuild.

F. H. French, representative of the National Wire Fence Company, has been here looking over sites for their distributing warehouse here. Head office, Prescott, Ont. Negotiations are in progress for the establishment of a warehouse of the Pella Stacker Company, Pella, Iowa, U.S., of which Mr. Kayper is president. Commissioner of Industries, Mr. Sheffield.

The Board of Trade has been in correspondence with a soap company in view of its location here.

W. H. Cushing, formerly Minister of Public Works in the Alberta Government, has been inspecting his planing mills here with a view to future enlargement.

As a result of the recent visit to the city of Geo. B. Meadows, president of the Toronto Wire & Iron Works Co., Ltd., that firm has decided to locate a branch house in this city, and is applying for a site upon which to erect a three storey building.

St. Johns, Que.
The Clewt Peabody Company, of New York City, will erect a factory building for the manufacture of shirts, collars and cuffs.

Sherbrooke, Que.
The Dougherty Mill, Orford, was destroyed by fire on the 26th ulto. Fletcher Lumber Company are the owners. Estimated loss, about $10,000.

St. John, N.B.
Mr. Cutler, of Stetson, Cutler & Company, is willing to go on with the Mispec Pulp Mill if the city will give him an option to buy the property at $30,00 In the event of Mr. Cutler purchasing the property, he would either sell or organize a company to start a paper mill, employing 130 hands. Ald. Russell, Scully and Hayes will confer with Mr. Cutler.

T. McAvity & Sons expect to start construction on their plant in Port Arthur in about 12 months, but state that at present they have no inention of erecting a branch plant in Montreal, as was reported.

Sydney, N.S.
Major Calhoun, and J. Carling Kelly, English engineers, have been here on their way to Labrador, where they will erect a pulp mill. Estimated cost, $500,000. Lord Northcliffe is interested. Plans have been prepared.

South Vancouver, B.C.
Mr. A. Frederickson will build a two-storey structure, 50 by 75 feet, adjoining his place on the south. Mr. G. A. Horel is the archietct.

Mr. Joseph Coldwell will build a similar structure on Main street between Twenty-first and Twenty-second avenue.

Toronto, Ont.
Permits were issued to J. Ross Robertson for 4 storey brick publishing warehouse, 35 Melinda street, $70,000; Toronto Furniture Company, 3 storey brick factory on Dufferin, $68,000; Standard Manufacturing Company, 1 storey brick clearing house, Royce and Lansdowne, $12,500.

The Marin Pump & Machine Works will erect a one-storey brick factory building, 60 by 100 feet, on Davies avenue, near Queen. Work will begin immediately.

The Steel & Radiation Company of Canada, Limited, capitalized at $5,000,000, will, it is said, have factories at Montreal, Winnipeg and Vancouver, as well as here. The two Toronto plants, those of the King Radiator Company and the Expanded Metal & Fireproofing Company, now employing 250 to 300 men, will be enlarged.

Victoria, B.C.
Building permit was issued to John S. Bowker for one storey brick building containing five stores at a cost of $14,000. C. E. Watkins is the architect, and Luney Bros., contractors.

Permit was issued to Mr. P. Jeune for business building on Pandora avenue, $11,600.

H. S. Griffith, architect, 1006 Government street, is the architect in connection with the brick business block to be erected for Messrs. F. Moore and H. Smith on the west side of Douglas street. Excavation will be started in a few weeks.

Authority for building permit was granted to Moore & Whittington for the proposed sash and door factory to be erected in the vicinity of Bridge street.

Vancouver, B.C.
The Canadian Bank of Commerce will later on replace the temporary building on First avenue and Park Drive by a large brick and stone structure.

The projected plans of the C. P. R. for erection of hotels includes, besides the extensive additions to the Hotel Vancouver, Banff, new buildings at St. John, N.B., Toronto, Ont., Nelson, B.C., Ottawa, Ont., and Golden, B.C.

Messrs. Law & Von Dohlen, financial agents, Dominion Trust Company building, will organize a corporation for the purpose of manufacturing and marketing in Canada the Gray instantaneous automatic electric water heater, for which they have the sole Canadian patent. Capitalization, $150,000. Messrs. Ellis, Brown & Creagh, Davis chambers, are looking after the financial arrangements.

Wallaceburg, Ont.
Tenders were called until October 3rd for erection of concrete and brick hotel for A. Gilhuly. Specifications at office of the architects, Jas. L. Wilson & Son, Chatham.

Woodstock, Ont.
The Linderman Machine Company have under construction the erection of their new building here. It will be 250 feet by 100 feet, main centre aisle to be 22 feet to the trusses and 50 feet between crane posts. On each side of this centre building will be two 25-foot bays running the entire length of the building. They state that they will probably use a small amount of steam power as well as Niagara river power. Capitalization, $160,000. Head office, Muskegon, Mich.

Welland, Ont.
Deere & Company, Moline, Ill., U.S.A., write that building operations on their branch here have not yet been definitely decided upon.

By-laws to grant concessions to the following were carried: The John Deere Plow Company; an automobile factory; the Chemical Company factory; George W. Mixer, for the Allied Companies' factory. The township of Humberstone passed by-laws favoring the Deere Plow Company, and a macadam road, railway switch, and also the Allied Companies.

Walkerville, Ont.
Plans are being prepared for an addition to the plant of the Penberthy Injector Company to cost $20,000. The building of the addition, however, is conditional on the granting by the city of a fixed assessment and other concessions.

Winnipeg, Man.
The Doty Engine Works, of Toronto, recently incorporated in Manitoba, is now in communication with the industrial bureau, relative to the building of a modern shipbuilding plant on the banks of the Red river near Water street.

Tenders addressed to M. Peterson, secretary, Board of Control, will be received for excavation of earth and removal of same from the site of the sub-station No. 1 on King street near Notre Dame avenue. Details with the power engineers, Smith, Kerry & Chace.

Tenders are being called by V. W. Horwood, architect, 177 McDermot avenue, until October [illegible], for construction of solid brick warehouse on James and [illegible] streets for [illegible].

Yorkton, Sask.
The town of Yorkton is tendering for the sale of $140,000 worth of debentures, which will be received until November 15. Particulars from T. F. Acheson, secretary-treasurer.

AWARDED.

Montreal, Que.
Work has recommenced on the large store building for the Jas. A. Ogilvy Company, corner Mountain and St. Catherine streets. The general contract for the work has been relet to Messrs. D. G. Loomis & Sons, general contractors, St. Patrick street, Cote St. Paul. Architect, David A. Ogilvy, 127 Stanley street.

Contract for the roofing of the new store for the A. E. Rea Company, Limited, St. Catherine street west, has been awarded to Messrs. Sibley & Hout, 77 Duke street. General contractors, Byers & Anglin, 18 St. Alexis street. Architect, A. F. Dunlop, Lindsay Building.

The Imperial Tobacco Company are erecting a factory building on St. Antoine street. Price, $10,000. General contractors, Byers & Anglin, 18 St. Alexis street.

Contract for the roofing of the new station and hotel at Place Viger for the C. P. R. has been awarded to Sibley & Hout, 77 Duke street. General contractors, John Stewart & Company, 1 Bethune avenue, Westmount. Architect, Wm. Painter, C. P. R.

Ottawa, Ont.
The contract for the marble work on the Rosenthal Building has been awarded to J. K. Mills & Sons, Ottawa. The ornamental iron work has been awarded to Canada Foundry Company. Weeks & Keefer, architects.

Chamberlin & Co. has been awarded the contract of supplying the metal weather strips for the Chateau Laurier. Geo. A. Fuller Co., general contractors.

The Canadian Ornamental Iron Co. has been awarded the contract for the stairs and office railings in the Hope Building, Sparks street. W. E. Noffke, architect.

Owen Sound, Ont.
George Lethbridge has the contract for the brickwork in connection with the new furniture factory here, and A. Green the woodwork. Mr. Minchner is supervising the work.

Toronto, Ont.
The Bishop Construction Company have been awarded the contract for the new plant for the Glidden Varnish Company, Cleveland, Ohio, works at Toronto, consisting of tank house, power house and melting rooms. Contract price, approximately $20,000.

Vancouver, B.C.
The contract for the structural steel in connection with the erection of the building for the "Vancouver World," has been awarded to John Coughlan & Sons, of this city. Estimated cost, $125,000.

Victoria, B.C.
The contract has been let for the erection of a two storey brick block for Mellor Bros. on the south side of View street, $12,000. C. E. Watkins is the architect.

The contracts awarded for the [illegible] Building, Rideau street, are: Mason, stone, concrete and brick work, Alexander & Campbell; carpenter work, A. Richards & Son; steel work, Dominion Bridge Company; painting and glazing, Wilson [illegible]; electric wiring and [illegible], McCallum & Company; [illegible], McFarlane & Douglas. W. E. Noffke, architect.

Tenders and For Sale Department

Tenders Wanted

Separate or bulk tenders will be received by the undersigned, sealed and marked "Tender for Town Hall," until SATURDAY, 22ND OCTOBER, at 4 o'clock p.m., for the erection of a Town Hall Building in the Town of Hanover.

Plans and specifications may be seen at my office, Hanover, and at the office of Forster & Clark, architects, Owen Sound.

The lowest or any tender not necessarily accepted.

JOHN TAYLOR, Town Clerk,
Municipality of Hanover.

September 12th, 1910. 39

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the SEVENTH DAY OF NOVEMBER, at 12 o'clock noon, for supplying to the City of Calgary Rails, Cars, Equipment and Overhead Material for extensions to Municipal Street Railway.

Full particulars and specifications may be had on application to the Commissioners, City of Calgary; marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Erection of Bridges," until the SEVENTH DAY OF NOVEMBER NEXT, at 12 o'clock noon, for the erection of steel bridges, one across the Elbow River at Twelfth Ave., and the other across the Elbow River at Second Street East.

Full particulars and specifications may be obtained from the Commissioners, City of Calgary, on application.

A marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

To
Building Contractors

Tenders are invited for the erection in Newmarket, Ont., for a large four-storey Factory Building for the Office Specialty Mfg. Co.

Tenders in bulk or separately for concrete work, brick work, carpentry, painting, plumbing, galvanized iron work and gravel roofing, will be received by the architect up to THURSDAY EVENING, OCTOBER 20TH.

Lowest or any tender not necessarily accepted.

The plans and specifications are now ready and may be seen at my office, Queen street, Newmarket, also at the office of the Contract Record, 504 Confederation Life Building, Toronto.

O. E. TENCH,
41 Architect.

To Contractors

Tenders will be received at the office of the undersigned until noon SATURDAY, OCTOBER 8th, for the various works required in the erection of a Sunday School Building for the Chester Presbyterian Church, Toronto. The lowest or any tender not necessarily accepted.

SYMONS & RAE, Architects,
40 15 Toronto street, Toronto.

TOWN OF OSHAWA

Outfall Sewer Extension

Sealed tenders for providing and constructing a Main Trunk Sanitary Sewer as an extension of the present outfall sewer, will be received by the Town Engineer not later than 12 o'clock noon of FRIDAY, THE 14TH DAY OF OCTOBER, 1910.

The work includes the construction of:
1,800 feet Sewer, 20-inch diameter.
1,860 feet Sewer, 24-inch diameter.
12 Manholes and all appurtenances thereto.

Yardage of excavation is approximately 2,700 cubic yards.

Plans and specifications may be seen and forms of tender, on which application must be made, obtained at the office of the Town Engineer.

The lowest or any tender not necessarily accepted.

W. E. N. SINCLAIR, LL.B.
Mayor.

FRANK CHAPPELL,
Town Engineer.

Oshawa, Ont., Sept. 21, 1910. 39

Notice to Contractors

Tenders for Machinery for Roundhouse at Lake Superior Junction and for Pumps and Motors for Sewage Pumphouse at the Winnipeg Shops.

Sealed tenders addressed to the undersigned, and marked on the envelope "Tender for Machinery" and "Tender for Pumps and Motors," as the case may be, will be received at the office of the Commissioners of the Transcontinental Railway at Ottawa until 12 o'clock noon of the 18TH DAY OF OCTOBER, 1910, for the machinery required for the equipment of a round house at Lake Superior Junction, Ont., and for the centrifugal pumps and motors required for the sewage pumphouse at the Winnipeg shops, Winnipeg.

Plans and specifications may be seen and full information obtained at the office of Mr. Gordon Grant, Chief Engineer, Ottawa, Ont., and of Mr. S. R. Poulin, District Engineer, St. Boniface, Man.

Tenders must be signed and sealed by all the parties to the tender, and witnessed, and be accompanied by an accepted cheque on a chartered bank of the Dominion of Canada payable to the order of the Commissioners of the Transcontinental Railway for a sum equal to ten per cent. (10 p.c.) of the amount of the tender.

The right is reserved to reject any or all tenders.

By order,
P. E. RYAN,
Secretary.
The Commissioners of the
Transcontinental Railway.

Dated at Ottawa, September 22nd, 1910.

Newspapers inserting this advertisement without authority from the Commissioners will not be paid for it. 40

Miscellaneous

Advertisement under this heading two cents a word per insertion.

INVESTMENT OPPORTUNITIES — Stock for sale in a well paying yard and planing mill business, or would consider silent partnership. If you are looking for a god investment here is your chance. Address Box 141, Contract Record, Toronto, Ont. 40

Power Plants, Electricity and Telephones

Berlin, Ont.

At the meeting called to discuss the question of securing natural gas for towns and cities in northern section of Western Ontario, Mr. G. H. Clarke, secretary of the Berlin Light Commission was appointed permanent secretary of the Union to keep in touch with the conditions of the natural gas fields and keep municipalities informed.

Belleville, Ont.

At the last meeting of council the offer of the Canada Company for a switchboard panel, three meter receptacles and one meter plug to be installed for $60, was accepted and the tender of the Allis-Chalmers Company for a venturi meter installed complete for $1,000 was also accepted.

Brockville, Ont.

It is reported here on good authority that in the near future construction work for developing power in the South Sault channel of the St. Lawrence, Long Sault channel and the mainland, which is entirely in American territory, will be commenced by the Long Sault Development Company. It is also reported that the Ontario and St. Lawrence Power Company intend developing power at Waddington; also entirely in American territory.

Galt, Ont.

A. M. Edwards, chairman of Finance Committee, is calling for hydro-electric power debentures, etc., until October 14.

Montreal, Que.

The city council has adopted the report of the Board of Commissioners in regard to the street lighting.

Ald. L. A. Lapointe gave notice of a motion that in thirty days he would move the adoption of a by-law to borrow $5,000,000 for the construction and administration of a system of underground conduits, which was in accordance with the legislative powers obtained by the city.

Niagara Falls, Ont.

The property owners on McRae street will erect six concrete pillars for electric lighting.

It is stated the Niagara, St. Catharines & Toronto Ry. Co. is planning an extension from Fonthill to Fernwick and the establishment of passenger service to the last-named plant. Definite announcement of plans has not yet been made by the company.

The Niagara, Welland & Lake Erie Ry. Co. has given notice that it will apply to Parliament at its coming session for power to construct an electric railway line from

Niagara Falls to points on Lake Erie between Fort Erie, opposite Buffalo, and Port Dover, via Welland and Port Colborne.

New Westminster, B.C.

The B. C. E. R. Company is calling for tenders for the building of freight sheds and a wharf in this city, the work to commence early in October. It is the intention to build the dock about thirty feet out in the river.

Renfrew, Ont.

Dr. McCormack presented a report from the waterworks committee recommending that a revetment wall at the Renfrew Electric Company's intake pipe be built this fall in order to protect the company's property and enable the council to proceed with the building of the new power house intake at the earliest possible moment next spring, Adopted.

Toronto, Ont.

The Board of Control adopted the report of the City Engineer (Hydro-Electric Department) recommending the acceptance of the following tenders: Storage batteries, Chapman & Walker Co., Ltd., $2,870; transformers, Canadian General Electric Company, $15,800; motor generator sets, Lancashire Dynamo & Motor Co., $2,262.

Victoria, B.C.

Gore & McGregor, land surveyors, have surveyors out on a route for an electric railway from Barkerville down the Willow river to join the G. T. P. at or near Fort George, a distance of about 120 miles. There are several places on the river which will supply ample power for operation of the system.

Vancouver, B.C.

Plans were approved by the board of works for the B. C. Telephone Company's extension of its system in Kitsilano. The trunk lines will be placed in the lanes between Third and Fourth avenues and extend as far west as Bayswater street.

Wynyard, Sask.

The town council has decided to instal street lighting, and experiments will begin immediately as to the most suitable light until power for electric lighting is available from the C.P.R. roundhouse.

Winnipeg, Man.

See "Business Buildings."

The Board of Control called for tenders until the 4th inst., for supply of 5,000 lbs. of No. 6 and 3,000 lbs. of No. 8 B. & S. medium drawn solid copper wire, and five miles No. 9 B. W. G. galvanized iron wire. Specifications with City Engineer. M. Peterson, secretary.

Tenders addressed to Chairman, Board of Control, will be received until Ouctober 20 for supply of 115 h.p., 60-cycle, induction motor, silent chain drive therefor. Copy of specifications at office of power engineers, Carnegie Library Building.

AWARDED.

Calgary, Alta.

Three tenders for supply of 20 motors for the six new cars on the street railway were received and were as follows: Westinghouse, $10,950; General Electric, $10,450; Allis-Chalmers-Bullock, $11,166. Although the tender of the General Electric Company was lower than that of the Westinghouse by $25 a motor, the latter was accepted because the cars at present are fitted with Westinghouse motors. The new cars which are to be ordered will not be fitted up for the Westinghouse motor as those that have been purchased have been. Other companies will thus be on the same level with the Westinghouse.

Miscellaneous

Hamilton, Ont.

Permits issued recently are as follows: F. J. Rastrick & Son, brick store and dwelling, James street, corner Picton street, for E. Briggs, to cost $2,000; Thos. Allen, two brick dwellings, Nightingale street, near Ashley street, to cost $4,000; G. W. Stephenson, brick dwelling, Holton avenue, between King and Main streets, to cost $2,500; Hancock Bros., two brick dwellings, Margaret street, between King and Main streets, for C. Fee, to cost $3,100.

London, Ont.

Tenders addressed to Sec. No. 3 Committee of City Council will be received until Nov. 2nd for a fire engine, 800 to 1,000 gallons; automobile or motor fire engine, 700, 800, 900 or 1,000 gallons. Ald. H. Ashplant, chairman.

Montreal, Que.

The following business permits have been recently issued: A. L. Cooper, an oil warehouse on Durocher street; J. H. W. Chandes, a cottage on Durocher street, $4,800; I. Crepeau, 1905 Park avenue, a cottage on Outremont avenue, $5,000; F. & G. Charland, house containing three dwellings on Querbes avenue, $4,000; B. Damien, 288 Mount Royal east, house containing two dwellings and store on Mount Royal avenue, $5,000; Fortier & Freres, 259 Mance street, two houses containing six dwellings on Mance street, $10,000; A. Mongeau, 1242 Bordeaux street, house containing three dwellings on Delorimier avenue, $3,000; J. B. Vien, 1103 Cartier street, house containing three dwellings on Rachel street, $3,000; S. Richard, 1063 Delorimier avenue, house containing three dwellings on Rachel street, $8,000; Z. Lussier, 2 St. Philomene street, house containing three dwellings on St. Emelie street, $3,000; Dr. T. R. Wilson, 44 Park avenue, 13 houses containing 52 dwellings on Cowan street, $32,000; A. Prevost, 11 Fairmount avenue, two houses containing six dwellings and three stores, St. Viateur and Waverly, $12,000; Mde. S. A. Hughes, 869 Maplewood avenue, a two storey house on Cote des Neiges road, $3,000; R. Laberge, 122 Marguerite street, two houses containing six dwellings on St. Marguerite street, $4,500; F. Larose, 506 Chambord stret, three houses containing six dwellings on Simard street, $5,000; E. Cote, 2396 St. Urbain St., house containing three dwellings on Waverly street, $3,000; Mde. V. A. Brunet, 971 Berri street, house containing three dwellings on Berri street, cost $3,500; Mde. M. Davis 239 Bishop street, house containing four dwellings on Summerhill avenue, $24,000; J. Brousseau, 721 St. Hubert street, house containing three dwellings on Park avenue, $6,500; N. Corneiller, 69 St. Germain street, house containing five dwellings on Cuvillier street, $4,500; J. C. Gauthier, 1235 Sanguinet street, three houses containing nine dwellings on St. Denis street, $9,000; J. J. Dempster, McGill St., a three storey residence on Howard avenue, $4,000; Estate Masson, 13 St. James street, alterations to property 467 Dorion street, $4,000; W. Gauthier, 210 Joliette street, alterations to property, cost $2,600; Eastern Townships Bank, Sherbrooke, P.Q., a bank building Crescent and St. Catherine Sts., $35,000; St. Lawrence Milling Co., Ltd., 1110 Notre Dame street west, a flour mill building, cost $77,000.

Toronto, Ont.

The time for receiving tenders for supply of two automobiles has been extended from October 4th until October 11th. G. R. Geary, mayor.

Recent building permits include: J. I. Nichols Co., 3 storey brick adition to factory, 184 Spadina avenue, $6,000; Dr. C. Brown, two storey and attic brick dwelling, and a garage, corner Bloor and Major, $5,500; Rev. G. A. Mitchell, 2½ storey brick dwelling, on Binscarth, $7,000; Queen City Oil Co., reinforced concrete tank, north side Antler, $10,000; W. P. Graham, one pair semi-detached 2 storey brick dwellings on 131-3 Emerson avenue, $4,000; Thos. Edmunds, 2 pair semi-detached 2 storey brick dwellings, on east side Symington, $11,200; Alexander & Son, 2 pair semi-detached 2 storey brick dwellings on Roxborough, $9,000; Wickham Bros., 3 attached 2 storey brick dwellings, Bartlett, $6,000; A. W. Reid, 2 detached 2 storey brick dwellings, Summerhill Gardens, $6,000; G. M. Bryan alterations to one pair dwellings on Yorkville, $4,000; W. Pinkerton, 3 attached 2 storey brick dwellings, east side Dufferin, $6,000; T. H. Smith, 2 storey brick dwelling, on Roxborough St. east, $6,000; Dr. F. C. Husband, 2 storey and attic brick dwellings on Roxborough street east, $6,000; Thompson & Mitchell, 2 rows of 3 attached 2 storey brick dwellings, on east side Montrose, $12,000; Thompson & Mitchell, 1 pair semi-detached 2 storey and attic brick dwellings, corner Montrose and Harbord, $4,500; Glidden Varnish Co., 1 storey brick grinding mill, corner Wallace and G.T.R., $8,000; J. F. Uren, 1 pair semi-detached 2 storey brick stores and dwellings on Dundas, $7,000; Robt. Luxton, 1 pair semi-detached 2 storey and attic brick dwellings, corner Pape and Globe, $4,600; J. Singer, alterations to dwelling, on 308 Jarvis street, $5,000; H. M. King, 2 storey brick dwelling on Glendale avenue, $4,000; F. W. Leeming, 3 pair semi-detached 2 storey brick dwellings, on south side Millicent, $12,000; G. B. Cooney, 2 detached 2 storey brick dwellings, on east side Dufferin, $4,000; A. J. Peppiatt, 1 pair semi-detached 2½ storey brick dwellings, 13-15 Boustead, $4,400.

Vancouver, B.C.

Building permits were granted as follows: A. B. McLellan, 2621 First avenue west, $3,700; J. P. Chisholm, 1920 Charles street, $2,300; Gold Seal Liquor Company, 722 Pender street, $3,500; T. G. Gray, 1258 Seymour street, $4,000; W. Winburn, 2817 Fourth avenue west, $2,300; Vancouver Engineering Works, C.P.R. reserve, $8,000; J. J. Skinner, 2070 Harris street, $2,000; J. Morley, 1644 Sixth avenue west, $2,400.

Victoria, B.C.

The following bids for repairs of steamship Princess May were received: Heffernan Engine Works, Seattle, $131,200 (including duty), 85 days; Hall Bros., Eagle Harbor, $120,000 (plus duty), 95 days; Moran Shipyards, Seattle, $125,000 (including duty), 60 days; Williamette Iron Works, Portland, $105,000 (plus duty), 90 days; Wallace Shipyard Co., Vancouver, $98,750, 76 days; Victoria Machinery Depot, $94,300, 84 days; British Columbia Marine Railway Co., $85,000, 80 days. None considered. Two courses are open, to call for new tenders or to repair the vessel by day labor.

Guertin & Fils, sawmill proprietors, Grand St. Esprit, Que., are reported to have assigned.

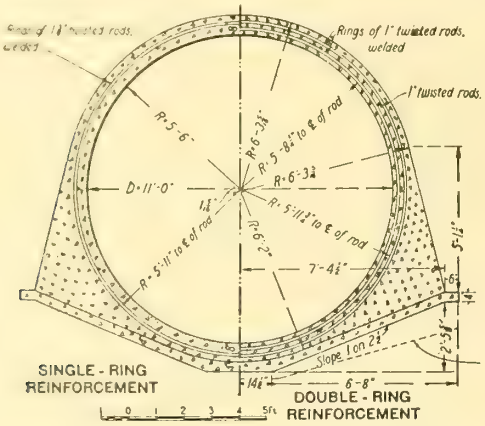
Pressure filters, placed direct on the mains, are in use by the Krugersdorp municipality, South Africa, which obtains its supply from a reservoir in which the water during heavy rains, becomes highly discolored. The filters are of the Candy type, according to the "Surveyor." Each is [illegible] feet in diameter, has a capacity of [illegible] imperial gallons per hour, and operates under a head of approximately 70 feet.

Results of Tests for Leakage under Pressure of a Reinforced Concrete Pipe

The reinforced concrete pipe shown in section by the accompanying cut was constructed for test purposes at Hunter's Brook on the Catskill Aqueduct of the New York water supply. The section 210 feet long was built in place with the purpose of making it a part of the permanent construction should the tests prove satisfactory.

The principal features of this pipe are: Length, 210 feet, made up of seven 30-foot sections; inside diameter, 11 feet; thickness, 8 inches; reinforcement, welded rings of twisted square steel bars, about 1 square inch of cross-section for every 2½ inches of pipe length. The concrete, consisting of 1 part Portland cement, 2 parts sand or stone screenings, and 3½ parts gravel or broken stone, was machine mixed, quite wet. Transverse tests made on samples of this material at 7 months — the average age of the pipe when tested — indicated an average tensile strength not less than 330 pounds per square inch, the so-called average transverse strength being 400 pounds per square inch.

When first tested under a head of 28 feet the leakage from the pipe was at the rate of 560,000 gallons per mile per day, most of which was due to porous spots in the sides of the pipe, especially where stone screenings had been used in the concrete instead of natural sand. After grouting and pointing the defective portions with cement mortar, the leakage was as follows:



Section of Reinforced Concrete Conduit Tested for Leakage

Head feet.		Gals. per mile per day.
30	Leakage	55,000
62	Initial leakage	119,000
	Decreasing after 6 hours to	78,000
93	Initial leakage	215,000
	Decreasing after 2 days to	110,000
125	Initial leakage	465,000
	Increasing after 5 repetitions in 6 days to...	816,000

After again pointing and painting the interior surface with cement grout, the leakage was as follows.

Head feet.		Gals. per mile per day.
34	Leakage	28,000
62	Leakage	36,000
92	Leakage	114,000
125	Initial leakage	240,000
	Increasing after 6 repetitions within 6 days to	497,000

The magnitude of the leakage in the first test was due mainly to imperfections in the concrete. Under a moderate head, less than 100 feet, the leakage decreased while the head remained constant, but when the head was increased the leakage increased at a somewhat higher ratio. On reaching a certain "critical head," in this case about 100 feet, the permeability of the pipe was radically changed, the leakage not only increasing at a much higher ratio than the head, but with each new application of pressure, indicating that the concrete begins to crack when the "critical head" is exceeded. A large number of longitudinal cracks were actually observed; most of them, however, were so fine as to be perceptible only by color differences while the concrete was still damp after the pipe was emptied. When the first cracks appeared the tensile stress in the concrete was estimated at 270 pounds per square inch, or 82 per cent. of that derived from beam tests. The above results are for the pipe as a whole, although considerable portions of the pipe remained dust-dry under the maximum head of 125 feet.

Method and Cost of Wedging and Chiselling out Concrete in Tunnel Lining

To install ventilating apparatus in the permanent shafts of the new East river tunnels of the Pennsylvania Railroad at New York City there had to be removed some 28 cubic yards of previously placed concrete lining in the adjacent tunnel walls. This concrete lining was inside of the cast iron lining rings and fear of breaking these prevented drilling and blasting. The method adopted is described as follows:

Holes were drilled in the concrete about 4 inches apart on a horizontal line, and perpendicular to the face. Parallel to the first row and about 8 inches above it, another row of holes was drilled, the holes being pointed downward at an angle of about 40 degrees. Steel wedges were driven into the upper holes, and resulted in breaking out wedge-shaped pieces of concrete. Another row of inclined holes was drilled about 8 inches above the second row. Steel wedges driven into the holes of this row broke out other fragments of concrete. This process was continued until the space for the nozzle was roughened out to approximately its final dimensions. It was then finished to nearly its final form by chisels operated by air hammers, and smoothed up with a stone-axe operated by hand.

In each tube this work required the removal of about 14 cubic yards of material. The cost of this removal was about $72.50 per cubic yard, including the work of finishing the surface. The surface dressed was 515 square feet. The average depth of cutting was about 9 inches. The cost was about $2 per square foot of surface dressed, including the removal of material.

Hintonburg Drainage System

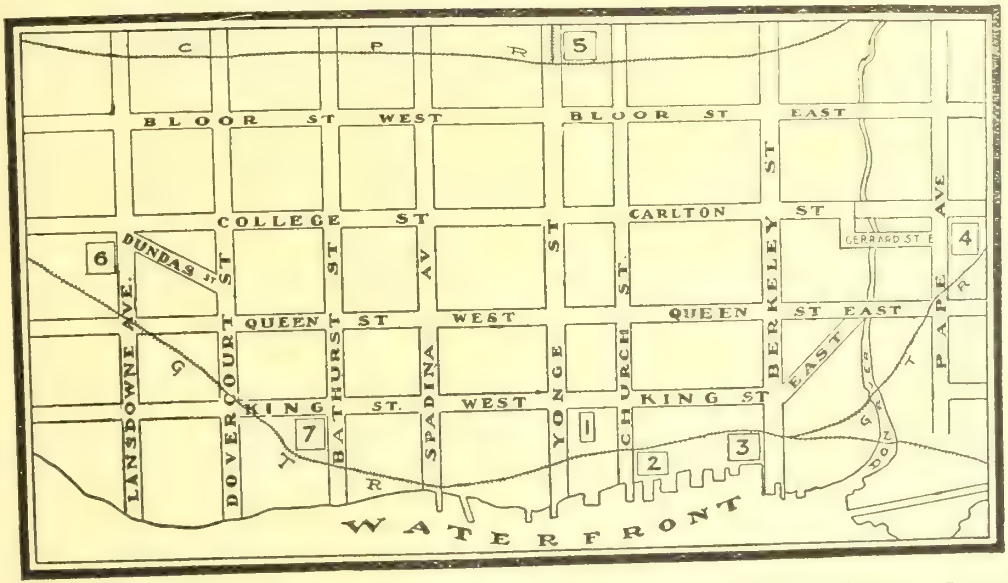
The Hintonburg, Ottawa, drainage system, commenced in 1908 was completed in 1909 at a cost of $52,532.37 including interest. The tile pipe sewers were of varying sizes, 24, 18 and 12 inches in diameter at varying depths below the surface from 13 feet to 6 feet. The strata proved to be very hard and difficult to work, including running sand with boulders, hard pan, granite boulders and limestone rock of a very flinty nature. The Ingersoll Sergeant steam drills were used where possible, but on Wellington street hand drills were used exclusively owing to the rock being on twisted beds and making drilling and blasting difficult.

A dearth of bricklayers is reported from Winnipeg, Man., where the prevailing wage is as high as 70 cents an hour.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

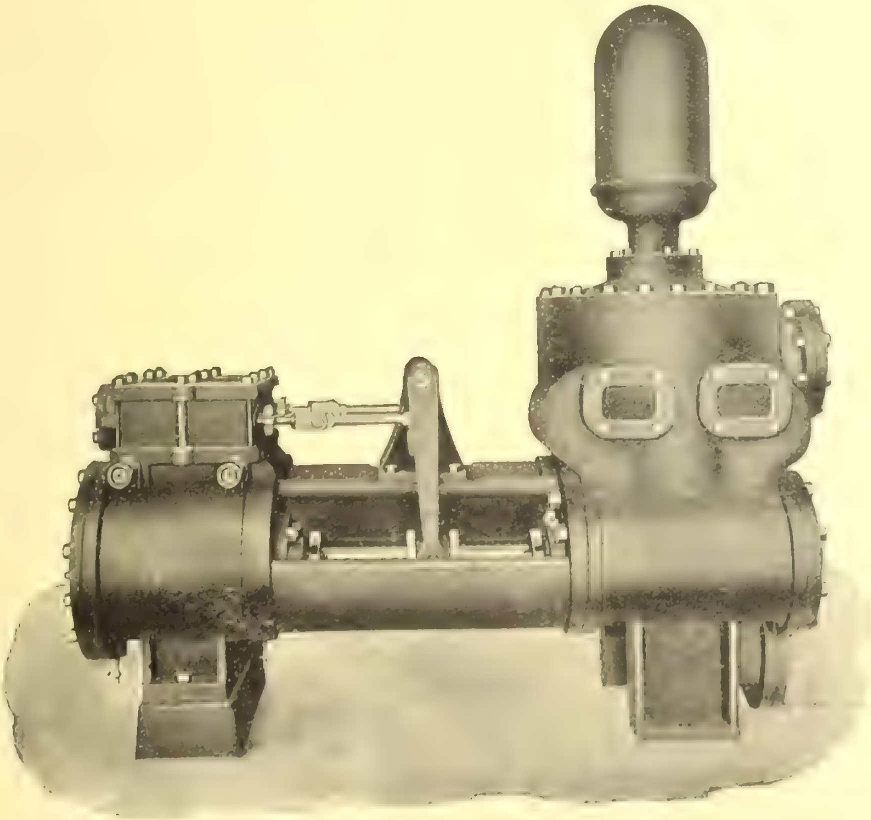
Telephone
Main
4
1
5
5



No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto



The Blake Pump

STEAM PUMPS
FOR
BOILER FEEDS
AND
GENERAL SERVICE
CARRIED
IN STOCK

WORKS: MONTREAL

THE
JOHN McDOUGALL
CALEDONIAN IRON
WORKS COMPANY
LIMITED

Portable Con

Carri

The Holland Acetylene Light

A Splendid Brilliant White Light
of Smaller Power than
the Buckeye.

Write for Bu

Head Offices and Warehouses :
Montreal

MUSSEN

ctors' Lights

ck

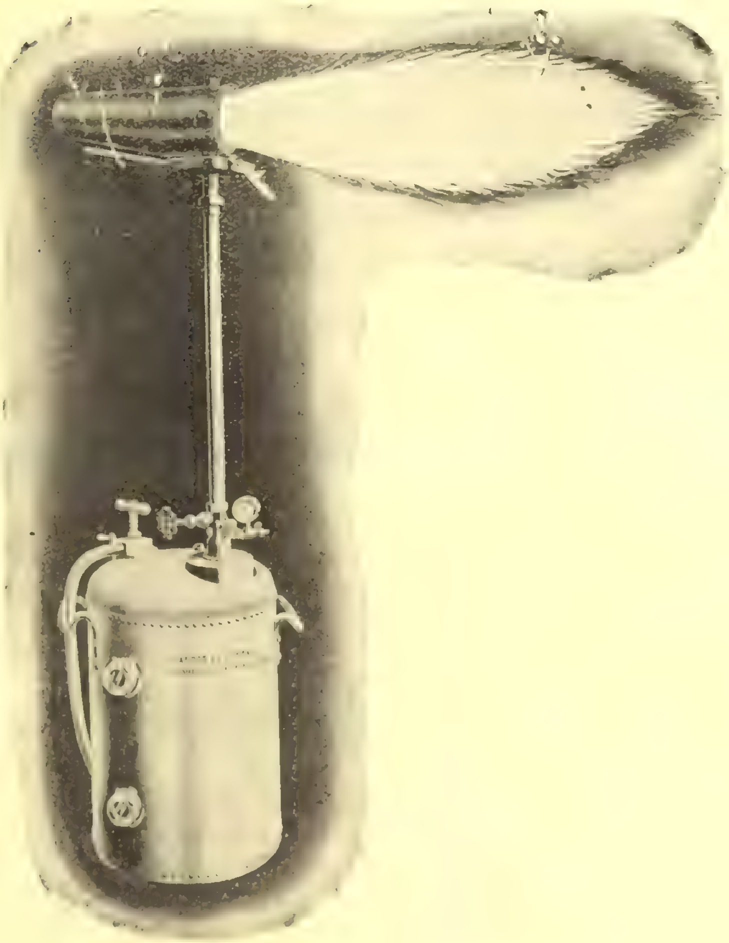
-For-

Contractors
Railroads
Mines
Quarries
Dredging
Shipyards
etc., etc.

Buckeye
rosene Light

apacities from 2000
0 Candle Power.

conomical to operate.



o. 22

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's Waterproof White and Colored Finishes

This material is especially intended for use upon plaster, brick, cement, tile, iron and wood surfaces, producing a soft, flat finish, which can be washed without detriment. This product carries unusual merit along the lines of intensifying the radiation of light in areas, hallways, elevator shafts, etc. It can be used to good advantage upon interior walls of factories, warehouses and similar places. It has tremendous covering capacity and excellent brushing properties, a very good result being produced with two coats.

Where used over finished work, having a light ground, one or two coats will produce a very satistactory result. It is pure white and stays white, is easily applied, producing a most sanitary and beautiful effect. Covering capacity, waterproof features, durability and light radiating properties, make it the most economical and best Wall Finish ever produced.

Covers 300 square feet and upwards to gallon, according to surface.

Specifications.

When used upon cement, plaster, and similar surfaces apply these materials over our Alkali Proof Wall Size. Brush same well out over the surface to obtain uniform covering properties, thus avoiding laps and brush marks.

When applied upon sand-finished plaster, work the material well into the pores.

Upon smooth white plaster finishes we recommend a coar three coats applied over our Alkali Proof Wall Size, elimi- followed with two or three coats of our Waterproof Flat Finish (color to be selected, or white to be used and tinted to meet architect's desired color scheme).

Upon sand-finished plaster surface we recommend two or three coats applied over our Alka ilProof wall Size, eliminating the coat of flat white lead.

Allow plenty of time between coats for thorough drying. Apply under favorable temperature conditions, preferably 70° F.

When applied to wood and metal surfaces, eliminate Alkali Proof Wall Size and white lead treatment, using two or three coats of the Flat Finish, applying same directly to the surface, which is to be dry, clean and free from rust, grease and foreign matter.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio
Distributed in Canada by

Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

FIRE ALARMS
THE NORTHERN ELECTRIC AND MFG. CO. LIMITED
TELEPHONES SUPPLIES

Inter-phones

No. 2016—Type-Metal Inter-phone for desk use

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

THE **Northern-Electric**
AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.

HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
J. R. HOOPER, Representative.
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto October 5, 1910 No. 40

Advice that Lacks Conviction

Mr. A. W. Smithers, the chairman of the Grand Trunk Pacific, speaking at a Canadian Club luncheon in Winnipeg, a few days ago, said that the people of Canada were trying to go ahead too fast. Mr. Smithers should have been more specific than he was in indicating the direction in which the country is going ahead too quickly. To generalize, in matters of this kind, is to rob the advice, sought to be given, of any real value. It is possible that, as chairman of a transcontinental line, still under construction, he has his eye on other fields, the rapid development of which would militate against the chances of his own concern for future extension. Mr. Smithers' statement does not appeal to us.

The Old, Old Story at Montreal

The Montreal Board of Control have asked the Roads Department for a report as to the advisiability of the city's undertaking practically al its own paving work, instead of awarding it by contract. Some of the members of the Board, it is stated, are of the opinion that this work can be carried out equally as well by the city as by contractors, and at a great saving.

If Montreal decides in favor of day labor it will be characteristic of the blundering that has marked the city's administration in recent years. One would think that in Montreal, of all places, the officials would scoot the very idea of anything that lent itself to patronage. Yesterday, as it were, the city turned over a new leaf after the most humiliating exposures. To-day it inserts the thin edge of the wedge with a view to re-opening the old breach. It cannot be said that ignorance or inexperience is accountable for the proposal under discussion. The city has had every opportunity for learning both the consequences of the patronage evil and the economy of contract work. There can be no excuse for making the same mistake twice.

It is difficult indeed to assign any substantial reason for this opposition to the contract system. Under any other system there are always occasions when those so minded take a slice off some fat job either for themselves or their friends. It stands to reason that the interests of the city will suffer if the stimulating influence of competition is removed. Moreover, the city obtains from the contractors a five years' guarantee of the streets paved. These and many other considerations, which have been discussed before, are against the course the city is taking, and if the proposal goes through it will prove a costly blunder.

Methods of Finishing Concrete

There is a small school of concrete workers which holds that the rough, board welted surface left by the forms is the only concrete finish that is truly artistic. Popular tastes, however, approves a finer finish, says "Engineering-Contracting." Now as fine a surface finish as desired can be given to concrete—it may be made to take a very satisfactory polish and it may be tinted in a variety of shades. The real question in any case is merely a question of reasonable cost.

In glancing over the variety of methods of finishing concrete, listed in a recent report, one is compelled to notice the almost complete breaking away that has taken place from the idea of moulding concrete to a perfect finish or surface. We speak, of course, of plain run concrete surfaces. Mouldings, ornaments, etc., are still moulded and probably best moulded for most work to perfect surface. But ten years or so ago it was the prevailing practice to seek surface finish by minute care in building the forms or moulds. Builders of concrete work whose experience runs back a dozen years will recall the almost cabinet work finish of form facing which was required, the covering of the forms with paper, the puttying of joints, etc. These requirements are rarely met with at present, though the demand for careful finish is more common in all concrete work than formerly.

There are few features of concrete work on which the general contractor is so likely to go wrong in estimating as the cost of surface finish. This comes, of course, from the want of good cost data. Contract prices for finishing are particularly misleading. This comes from the fact that few contractors have accurate costs on which to base estimates, and also from the fact that finish is regarded as one of the incidental items and is either lumped in with the total price or, if required to be bid on as a separate item, is put at some approximate figure, on the reasoning that any error which may result will be taken care of by the general profit on the job.

An increase in the total deposits in Canadian banks of no less than $116,290,649 over the corresponding month last year, is the feature of the August statement, which has just been issued by the Finance Department.

The assessor's returns are evidence of Toronto's wonderful growth in recent years. During the last five years Toronto's population has increased 43 per cent, compared with Montreal's 21 per cent. Toronto's present population is 341,991. This represents an increase of [illegible] per cent in 10 years. The head offices of 11 of the 33 chartered banks of Canada are located at Toronto.

Crescent Road, Rosedale, a charming locality in North Toronto, showing the possibilities of street improvement and design.

Modern Methods of Highway Improvement

Useful Lessons from the Experience of Mr. W. A. McLean, Provincial Engineer of Highways for Ontario—Merits of Various Equipment

A detailed account of the methods of highway improvement practised throughout the Province of Ontario will doubtless be of interest to our readers, and offer instructive pointers to many Canadian municipalities taking an active part in good roads work. The following extracts, taken from the annual report of Mr. W. A. McLean, provincial engineer of highways for Ontario, servie to show not only the advantage of highway improvement, but also, to just what extent those advantages are realized in the eastern province.

County Road Expenditure.—Seventeen counties have established county road systems under the Highway Improvement Act. These are: Carleton, Frontenac, Halton, Hastings, Lanark, Leeds and Grenville, Lennox and Addington, Lincoln, Middlesex, Oxford, Peel, Perth, Prince Edward, Simcoe, Waterloo, Wellington, and Wentworth.

The Act is applicable to thirty-seven counties, so that nearly one-half of the province is working under the Act.

The Act was passed in 1901, and in the next year the County of Wentworth created their present county road system; this being followed in 1903 by the Counties of Simcoe, Wellington, and Lanark. With this nucleus, the number of county systems has steadily grown. In 1909, the last two counties, Leeds and Grenville, and Carleton, passed the necessary by-laws.

To the end of 1909, the average has been equal to fifteen counties, each operating for four years, in which period 1,125 miles of stone, or good gravel roads, have been built. This neglects a large amount of minor, incomplete and scattered improvements which will eventually be a part of the permanent work.

Combining the items of road construction and supervision (the latter about $75,000), the total cost of road construction is $1,404,497.88. With 1,125 miles of road built, the average cost per mile has been approximately $1,250. This, as previously stated, neglects a large amount of incomplete and scattered work, so that the average cost per mile would be less.

Expenditure under the Act since 1902 has been as follows:

Toll roads purchased	$153,897.98
Sundry grants to townships, villages and towns	89,957.02
Permanent bridge construction	366,225.21
Machinery, plant, etc.	113,544.84
Road construction and supervision	1,404,497.88
Total	$2,128,122.93

Of this amount the counties have spent $1,418,748.63. The provincial expenditure, extending over eight years, has been $709,374.30, the province contributing one-third of the total, or one dollar to each two dollars raised by the counties.

Oiling Roads.—Crude oil sprinkled on macadam roads is proving itself a very satisfactory means of keeping down dust, and in this way largely overcoming the damage done to the roads and to adjacent property by constant automobile traffic. Oiling has been largely used in Toronto, and has displaced the use of water on all macadam and earth roads for preventing dust. An experiment was tried by the County of Wentworth in 1909, on a mile of the Stony Creek Road, where motor travel is frequent. This year (1910), it is to be used to a considerable extent, especially in fruit growing sections, where dust is a cause of much loss.

Oils with an asphaltic, rather than a petroleum base, are preferable. Two or three applications of oil within a fortnight early in the summer; this followed by applications four or six weeks apart during the summer have, to the present, been the most effective method of dealing with the dust produced by automobile traffic. A mixture of crude oil and limestone dust makes a toughened skin over the roadway that prevents dust and preserves the metal surface. The oil is sprinkled from a watering cart driven at a fairly rapid ate. The oil should be scattered—not allowed to collect in pools, to be splashed by traffic or stain the clothing of pedestrians. A man should follow the cat with a broom to brush such pools away. The quantity of oil varies with the condition of the street—but ordinarily 1,500 gallons per mile will make the three first applications on Toronto streets, 24 feet wide. The oil lasts longer on shaded streets, and dries out more quickly when exposed to the sun. The oil costs four cents a gallon, and is applied for less than one cent. While not itself a bonding material, its influence upon the bond of a road is such as to deserve consideration in this connection.

Road Rolling.—Rolling is essential to the construction of a good stone road. It is impossible to build a stone road cheaply and durably without a roller, and the same is true with regard to the best class of gravel roads. Roads built of loose stone take from one to three years of traffic to consolidate them. During that time the roads are a serious obstruction to traffic. On short patches this is not so noticeable; but on long stretches of one or two miles, it is distinctly objectionable and much dissatisfaction arises. Before traffic can, with comfort, use the metalled roadway, the earth sides are cut up, drainage is blocked, and the entire roadway is frequently rutted or worn out of shape by vehicles travelling along one side of the stone.

Councils in selecting a steam roller should choose the best; and repective merits should be carefully studied. A saving in first cost may be many times offset by the additional cost of operating or maintaining an inferior machine. Maximum results and fewest stops for repair are all-important in seeking true economy. Rolling is not an added expense to the cost of a stone road. The cost of rolling is more than made up by the saving that results in several ways.

Coarser stone can be used in a road that is rolled so that the cost of crushing is reduced. Between stone crushed fine enough to be used without rolling, and the coarser stone suitable for a rolled road, there may readily be a difference in cost of from eight to ten cents a ton. This alone will nearly pay the cost of rolling limestone.

Roads built without rolling, demand a great deal of attention for several years that is not given to rolled roads. The stone has to be raked to place from time to time; the earth sides have to be levelled where they have been cut up and destroyed; new material has to be added to fill hollows and ruts.

Rolled roads are more durable, and in consequence the cost of repair and maintenance is greatly reduced. With coarser stone in the roadbed it is stronger to resist wear; and it is more securely bonded than where it is first rutted and mixed with mud. Less stone is required on a rolled road, as loose stone is largely forced down into the mud or is knocked to the ditches by traffic.

A good road should have a foundation of uniform strength, surfaced with a well-bonded coat of stone of uniform thickness. By rolling the sub-grade, weak spots are developed which can be filled with earth and again rolled to produce the uniform foundation. Earth for this purpose is cheaper than stone. When weak spots are brought to grade in this way, the uniform coat of stone can be applied and rolled to its permanent place. Only a roller will do this work.

In addition to less cost, a stone road built with a steam roller is a complete work. It is in the best of condition to drive on as soon as rolling is finished. Rolled

The "Eaton" Road at Islington, Ont., in course of construction. The first step was to scrape from the top and sides all dust, mud and loose material, getting down to the old stone roadbed.

roads are a delight to those who have been accustomed only to old-time methods, and have done much to popularize county road systems.

The Grading Machine.—The grading machine has done much to reduce the cost of grading, draining, and turnpiking roads, and to improve the character of the work. The usefulness of a grader, however, depends wholly on the skill and experience of the operator, and the system of using it. The machine has not itself intelligence—this must be supplied by the municipal council in the provision made for operation.

The grading of the roads of any municipality should be undertaken as early in the spring as condition of the soil will permit. The work should have been carefully staked out by the road superintendent. The machine and equipment, horses and men, should be employed for the season or until the work for the season is all competed. The several jobs should be taken up in series across the township or county instead of sending the machine and equipment here and there, back and forth in an unsystematic way. When the work is undertaken without system, green horses are used on every new job and have to be trained for the work. New men have to be trained for every new job. Half the time of the men and horses is taken up in hauling the machine back and forth across the municipality. The work of grading is too important to be carried on by unskilled labor, and the grading machine should be in charge of one man for the season; and he should be employed year after year for this work, as far as circumstances will permit.

The grading or turnpiking of roads is a much neglected department of road construction. Any one without experience or training in roadmaking can haul gravel and dump it on a road. Any one can break up stone and spread it over the road surface with ordinary results. The spreading of gravel and stone on a road is commonly looked upon as the important phase of roadmaking; some appear to think it the only part of roadmaking that deserves consideration.

The common method of making a road in some townships is to merely haul the gravel or stone to the road and string it along in a more or less irregular line. It frequently follows the windings of an old earth roadway thrown up by statute labor years ago, before the country was wholly cleared. It was consequently bent and twisted along the road allowance to avoid streams, logs and other obstacles. The cutting of hills and the filling of depressions was only partially undertaken. To call the spreading of stone in this way "road construction," is a very unfortunate meaning to attach to the work.

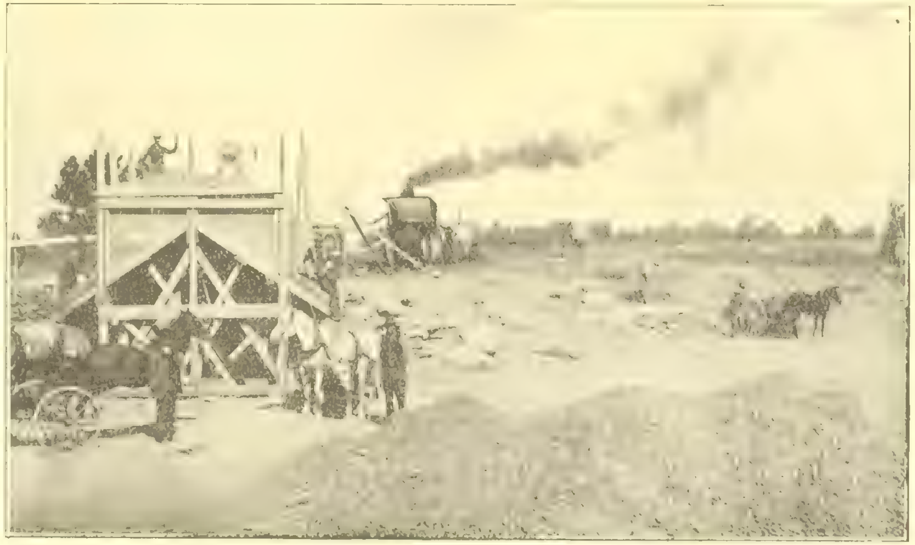
The grading of a road requires careful and discriminating judgment based on experience. The grading of a road means that it will be turnpiked; that the alignment of this turnpike will be straight and in the centre of the road allowance; that hills will be cut down and hollows filled up with the excavated earth; that the drains will be deepened or cleaned, or carried to a free outlet as circumstances may require; that the camber or crown of the road will be carefully considered; that the shoulders will not drop off in straight lines, but will be given a full curve; that earth will be brought to the edge of the stone so as to give the roadway a full and complete surface.

The placing of stone or gravel on roads, as commonly done, requires little judgment. Grading, on the other hand, means that the man in charge will use intelligence, coupled with painstaking effort to get the work right. The grading of a road is the cheapest part of the work as a

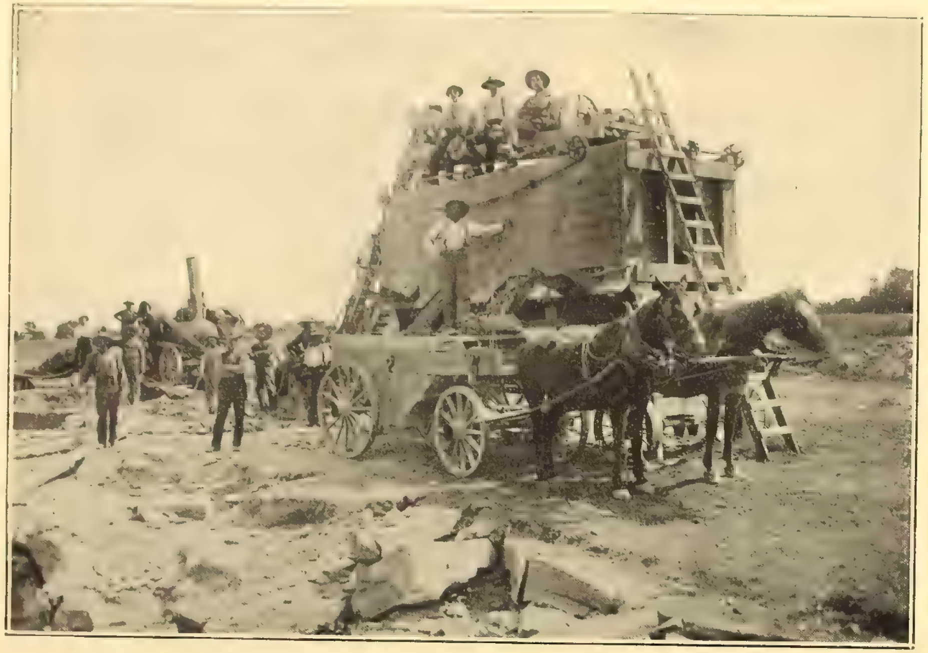
The "Eaton" Road at Islington, Ont. All soft and loose material from the old stone roadbed, having been graded, new crushed stone was spread to a width of 18 feet, and an average depth of 10 inches at the centre and 4 inches at the sides.

Standard Concrete Culvert, designed for the Sudbury-Soo Trunk Road.

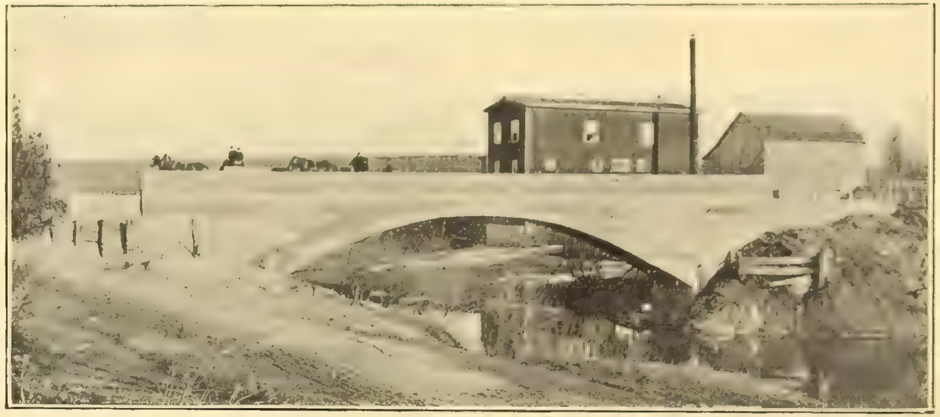
Crushing gravel near St. Mary's, Ont., for Perth County Roads—Plant of the Climax Road Machine Company, Hamilton, Ont.



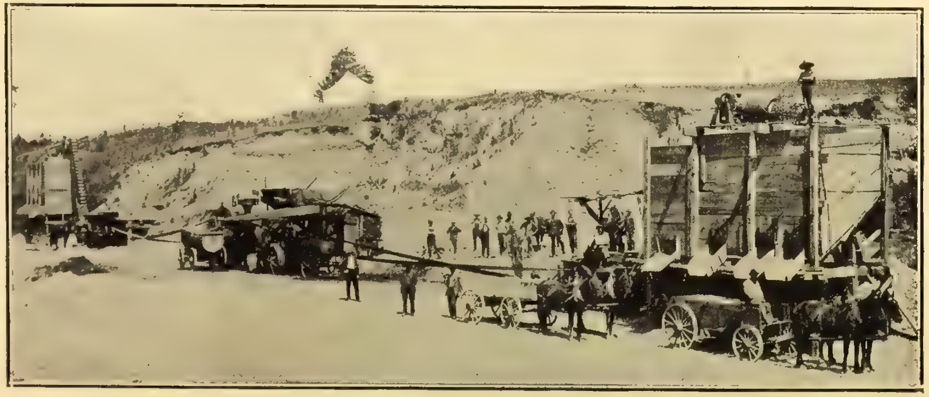
Stone crushing with Climax plant in Prince Edward County—Loading screened stone from the bin.



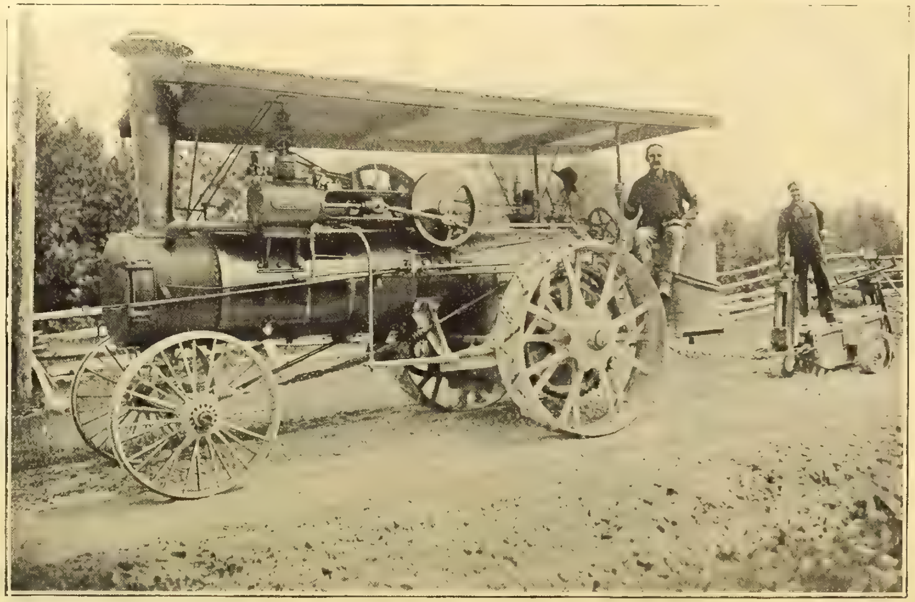
Crushing stone for Frontenac County Roads near Kingston—"Climax" plant.



Concrete arch on the Middlesex County Road System. Built in 1909 at St. John's. Span, 75 feet clear; roadway 16 feet wide. Cost $4,118.



Stone Crushing in South Oxford, using coarse gravel.



A Road Scarifier operated by traction engine in Frontenac County, Ontario.

rule, for the expense in most localities will arise through the treatment and hauling of gravel or stone. The cost of grading is low, but it is the crucial point in the building of a road.

The Rock Crusher.—Rock crushers with screen attachments are used for breaking quarry stone, field stone, and for treating gravel. They are being largely purchased throughout the province. Under suitable local conditions they are an essential part of a road-making plant. They are subject to severe strain, and in selecting one of these machines, municipal councils should seek strength and economy of operation, rather than a low first cost. Portable crushers, such as are rated at 100 cubic yards in ten hours are more economical than small sizes, as the cost of operation is nearly the same in either case.

Crushed quarry or field stone of reasonable quality is much more durable than is common gravel. The comparative life of stone and gravel roads depends on the amount of traffic. Gravel may give good service under light travel. But the heavier the travel, the more favorable becomes the use of broken stone, which is more durable and does not wear and rut so readily as does gravel. It is ordinarily assumed that one load of crushed stone is equal to two loads of gravel. Crushed and screened gravel very often does not cost any more, on the road, than does gravel in its natural state. This arises in two ways from reduced cost of teaming and loading:

(1) Coarse or loamy or sandy pits near the work may furnish a supply of gravel suitable for crushing or screening, but not fit for use in its natural state, and in this way the shorter haul and reduced cost of teaming offsets the cost of crushing.

(2) By elevating the crushed gravel to a bin, wagons may be loaded in three minutes, instead of in a quarter of an hour or twenty minutes, so that teams are not paid for standing in the pit.

Bins should always be used to receive stone from the crusher. Unless this is done, the crushed must frequently be stopped, keeping the entire equipment of men and machinery idle, while waiting for empty wagons. For the same reason, if field stone is used, it should be piled in advance of crushing, so that the outfit will not be idle while waiting for loads of stone to come up. By pilling stone in the winter when farmers are idle the cost is usually lessened.

A rotary screen should be used on each crusher, elevating the crushed gravel or stone to the screen by means of chain buckets. The size of perforations in the screen will depend on the material being crushed. For ordinary quarry limestone or field stone when a roller is used, it is desirable to separate the material into three grades:—(1) Such as will pass a 1-inch mesh; (2) Such as will pass a 3-inch mesh; (3) Tailings.

The "tailings" or coarsest size passing the crusher should be put in the bottom of the road. The 3-inch material should be spread over the tailings. And the 1-inch material can be used as a surface dressing. Care should be taken not to use too much of the surface dressing—merely enough to assist consolidation with a roller.

For crushed gravel the screen should have a wire dust jacket wrapped around part of the 1-inch section of the screen to remove sand, dust and loam, using a ⅜-inch mesh for this purpose. This fine material should not be wasted. When spread on top of the stone to a depth of two or three inches as is sometimes done, the effect of screening is largely lost, as the fine stuff turns into slush in wet weather and ruts are commenced. There is usually plenty of sand and mud on the road without paying for hauling more. Clean stone, well consolidated by rolling, is what is needed on the roads.

Staking the Work.—Work should always be staked out in advance of grading, draining or metalling, so as to keep the road as straight as possible or in the most desirable location. Stakes should be about 12 or 18 inches long, and placed about 100 feet apart on straight stretches. On curves, they should be close enough to guide the plow, grader, and spreading of stone.

The centre of the road should first be determined at points several hundred feet apart—as far as pickets can be seen. Then measuring a uniform distance to each side of the road, where a line of stakes will not be disturbed in grading (say 20 feet from the centre), plant pickets. Measure with a tape line and place stakes temporarily at proper intervals (usually 100 feet); and when this is done sight them into a true line between pickets. An engineer can use a transit for this work; but a reasonably true line can, with experience, be sighted with the eye.

From the stakes so planted, foremen can measure to the centre or side of the road, drains, edge of metal, etc., and keep the work in alignment.

The Scarifier.—The road scarifier is a machine almost unknown in Ontario, but is an extremely useful one for road-making purposes. A scarifier has been used by the County of Frontenac during 1909. This machine cost $475, and is used in breaking up the surface of old stone roadbeds, in order that the roadbed may be properly shaped before putting on new material. It is of special use in a locality such as Frontenac, where crushed stone has been largely used for years. By means of the scarifier, the grading of these old roads can be more cheaply and effectively done. When properly shaped, there is a considerable saving of new material, as less new crushed stone is required to crown the road and fill up inequalities. This work is at times done with a road grader, but is a severe strain on that machine, and usually results in considerable outlay for repairs. Counties and townships having the treatment of old gravel and stone roadbeds to consider should study the results obtained by the use of a scarifier.

Hand Scraping of Mains

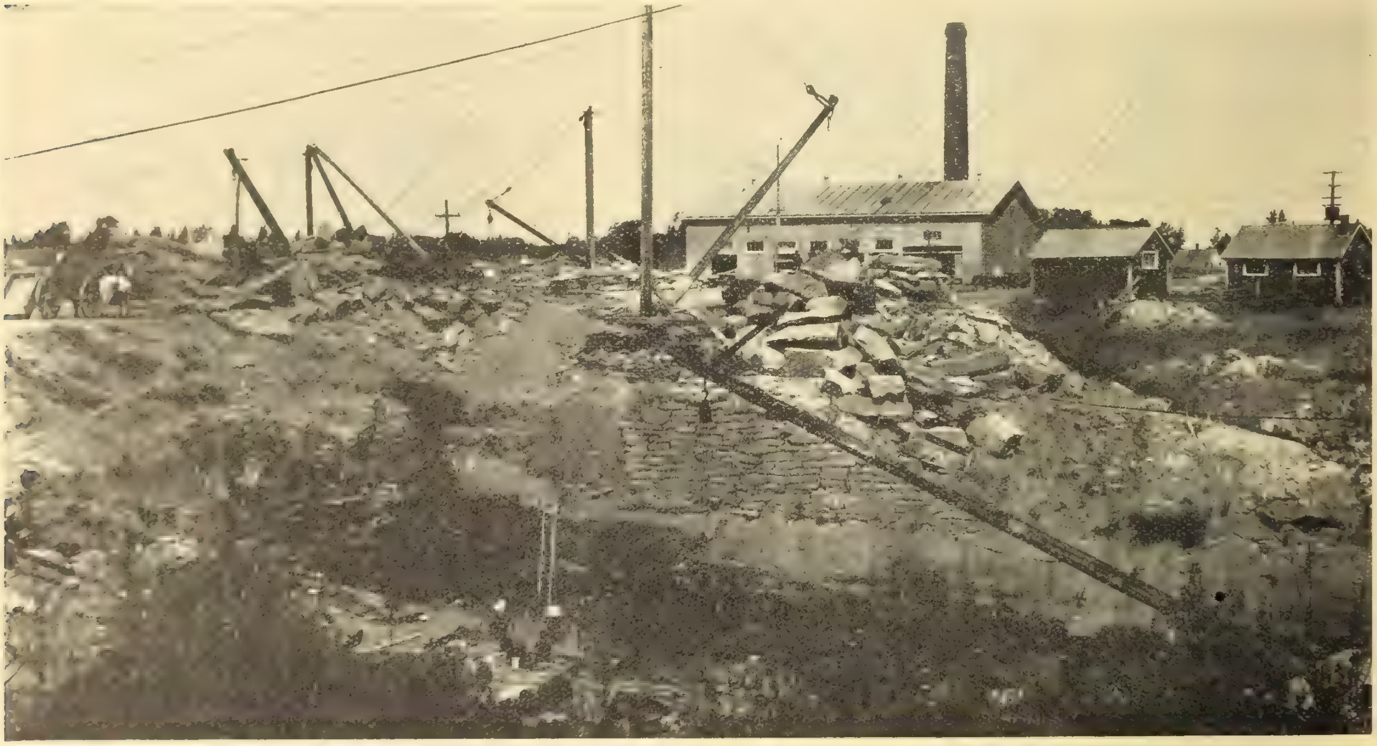
The scraping of mains at Dundalk, Ireland, is accomplished both by hand and by pressure-driven tools. The hand method is used on pipe of from 3 to 5 inches in diameter; a 5-foot length is cut out of the line and scrapers fixed to the ends of stout cane rods inserted in each direction. During the operations water is allowed to run freely from the pipe. Two types of tool are used on the hand work; a round chisel-pointed bar with a bow spring on one side, made to fit the circumference of the pipe, or a spring steel coil fitted on a ¾-inch round bar centre. Mr. M. Sellars, town surveyor, who presented a paper upon this subject recently before the Institution of Municipal and County Engineers at Dublin, does not recommend the drawing of scrapers by chains and windlasses. Hand scraping on 3-inch mains is said to have cost from 5 to 7 cents per linear yard. The pressure-driven scraper used is fitted with adjustable blades and with a swivel joint between the sets of knives, to facilitate travel around corners. The head necessary to drive a 5-inch scraper, according to Mr. Sellars, is 60 feet; it is desirable, however, to have an available static pressure of from 80 to 150 feet for pipes ranging from 12 to 5 inches in diameter. The proper rate at which to drive the scraper is given as 4 feet per hour.

Notable Stone Quarries at Sackville, N.B.

Resources and Plant of the Sackville Freestone Company—A Progressive Industry that has made a name in the Canadian Building World

For many years efforts have been made from time to time to introduce New Brunswick and Nova Scotia stones into the western market, but with little success; first, because of the difficulty in securing a satisfactory deposit of rock, and, secondly, because the organization of the different companies operating there was incomplete, and lacked an adequate knowledge of the requirements of the stone trade.

It has remained for the Sackville Freestone Company, Limited, of Sackville, N.B., to place on the market a stone, the equal of which, in the opinion of many, has not been found in this country, and which is now being used extensively in banks, churches and other public buildings.



General view of the Sackville Freestone Company's plant at Sackville, N.B.

This property at Sackville was opened up a number of years ago by Mr. C. Pickard and later taken over by the Sackville Freestone Company, Limited, of which Mr. Pickard is manager.

The isolated formation of rock deposited at Sackville during the new red stone period so graphically described by Dawson, the noted geologist, is certainly unique, in the respect that it is entirely local and altogether different from the other deposits in the country, being very even in color and quality, of a much finer grain, and taking a crushing test of over 9,100 pounds to the inch; while the other stones in the locality are coarse, uneven and soft, showing a much lower crushing strength.

The formation is in horizontal beds, from 2 feet to 9 feet thick. The quantity is unlimited, covering 40 to 50 acres of the company's property. The stone is uniform in quality, possessing that depth of covering which only the better class of stone displays, placing it at once in the front rank as a building material, where the very best architectural effect is desired. It is of even texture, great strength and durability, and is practically smoke proof. After many years of service in smoky cities, it retains a fresh and clean appearance. This the open and porous stones do not show, as the smoky moisture is carried into them so deeply through the open pores that cleaning is impossible.

While the company have an asset in this stone, which has undoubtedly been proven one of the best of its kind in the country, it is not altogether on this alone that its great success has been achieved. The up-to-date methods of handling the stone in the quarry, and the business-like way in which the industry has been conducted have also been important factors.

At the quarries will be found an up-to-date plant, costing over $45,000. Excavation work has reached that stage where any order, no matter how large, can be filled with the utmost despatch. As each order comes in the stone is cut to size in the quarry by steam drills. From there it is conveyed by steam cranes to the steel gangs in the power house. There it is finished off to the exact requirements specified. Two of these steel gangs are constantly in operation. A duplicate steam plant is maintained on the other side of the quarry. In addition to this the company have in connection the electric plant, so that it is impossible for operations to become suspended by a breakdown in any part of the power house, as either of the two auxiliary plants could immediately take up the work.

The fact that this stone was chosen for the extension to the Ontario Parliament Buildings, Toronto, in com-

Power House of the Sackville Freestone Company, where the stone is conveyed to be sawn.

petition with all other Canadian and American stones, is proof that the quality is of the best, and that the facilities for expeditious handling are equal to any in Canada.

The following is what an expert, sent to Nova Scotia by the Ontario Government to inspect different quarries, says in a letter to this company:

"I looked over your plant, and was surprised to note the extensive developments that had been done, the up-to-date equipment and your method of opening and showing up quarry face, making crosscut and blocking off. The quantity and quality of the stone in sight are the best in Canada."

The Sackville Freestone Company enjoy a large and growing trade in western Canada. The more the quality of red freestone is becoming known, the larger are the orders received for it. The manager, Mr. Pickard, is ever alive to improvements in the facilities for handling his output. He is now negotiating with several firms that are putting on a line of steamers from Cape Tourmentine to Fort William, Ont. The stone will be carried to western points by water. This method of transportation will cut the price of freight in half and thus reduce the cost of the stone considerably.

The firm has a reputation among contractors of being businesslike in every sense of the word. No work is undertaken that cannot be completed, and contractors are not delayed by the tardy execution of orders.

Wood-stave insulation joints have been substituted for rubber insulations on certain mains of the Metropolitan water system, Boston, to reduce electrolytic action. Tests of a 48-inch rubber gasket joint, which had

One day's shipment from the quarries of the Sackville Freestone Co., Sackville, N.B.

been in service four years, showed considerable electrical leakage, and upon removal was found to be black and hard in spots, with a cinder-like appearance, as if it had been carbonized. The positive section of the the reports of these experiments it is not generally stated whether the concrete is tamped parallel with, or joint contained numerous pittings $\frac{3}{8}$-inch in depth. A wood-stave joint which was substituted for the rubber joint stopped the further flow of electrical currents. The wood-stave joints, which were used on all new pipe lines laid during 1909, according to the last annual report of Mr. Dexter Brackett, chief engineer of the Metropolitan Waterworks, were placed at 500-foot intervals. The pipe sections at joints differ from the ordinary form, only in the bell end, which is cast without a lead groove; pine staves are used. The cost per joint varies from $12.45 for a 60-inch pipe to $4.35 for a 12-inch pipe.

rods had not been in contact at many places. In the extreme case there was no contact on the underside for a length of 18 inches. Either air had collected underneath the rod, due to improper tamping, or, the concrete in setting had shrunk away from the steel. In most structures where adhesion plays such an important part the rods are placed horizontally as in beams, and the tamping is done at right angles to the length of the rods. In columns, however, where adhesion is of relatively less importance, since safety would seldom if ever depend entirely upon it, the tamping is parallel to the rods. It is quite evident that the bond of union would be different in the two types of structures, namely, those in which tamping of the concrete is carried on at right angles to the rods, and those in which it is parallel thereto. It seems proper, therefore, that in making laboratory experiments to determine working values of the bond of union, this should be taken into account by preparing some specimens in one way and some in the other. Most experiments thus far recorded have been made by determining the amount of pull necessary to withdraw an embedded rod from a block of concrete, and from this the adhesion per square inch is computed; the assumption being made that the adhesion is uniform over that part of the rod's surface in contact with the concrete. In at right angles to the rod, but in most cases where this information has been given the tamping was parallel to the rod. From tests recently made, but not yet published, it seems that the adhesion for tamping at right angles is only about one-half that for parallel tamping. Recent tests to determine the adhesion by means of short beams are along the right direction, for it is not good engineering to obtain data from tests, and then apply them to designs where the conditions are entirely different. If rods are to be used horizontally in a beam then by all means let them be placed in a similar position in the tests which determine the adhesive values that are used as a basis on which the beam is designed.

The high-grade stone shipped from the quarries of the Sackville Freestone Company, Sackville, N.B., is attracting much attention.—The above is a typical carload.

Strength of Reinforced Concrete Beams

The strength of reinforced concrete beams depends, not only on the amount, kind and position of the steel, but upon the adhesion existing between the steel and the concrete. If the contract between these two materials is imperfect, or if the adhesion is insufficient or imperfectly distributed, the rods may slip and the failure of the beam may result, says the Engineering Record. This is especially true of plain round rods where the resistance to slipping is due entirely to adhesion. With deformed bars the bond is greater, and of a different nature, yet even here proper contract between the reinforcement and the concrete is of great importance. Plain square rods have the lowest value in adhesion, and this is one of the reasons why they are so little used in reinforced concrete construction. Recently in a series of test beams reinforced with plain square rods, the concrete between the underside of the steel and the concrete was examined after the tests had been made, by removing the concrete layer underneath the rods, and in several cases it was found that the concrete and lower surfaces of the

Building a Railway Bridge under Traffic

Novel Methods Employed in the Construction of an 80 ft. concrete arch at Philadelphia —Suggestive Ideas from Scheme of Progress Employed

The City of Philadelphia has recently completed a plain concrete arch bridge of 80-foot span to carry the Tabor Branch of the Philadelphia & Reading Railway over Belfield Avenue, a street hitherto closed by the railroad embankment. The chief item of interest in connection with it, says the Engineering Record, is the method of construction. The bridge was built directly under the railroad tracks without interruption of traffic, and the centre for the arch was constructed on the earth of the embankment without any trestle work under it.

The arch has a rise of 16 feet 11 inches, and the ring in 3½ feet thick at the crown and 8½ at the springing line. The material throughout is rubble concrete with all exposed surfaces made of white pebble. Reinforcement is used only in the architectural details of the railing.

The new bridge is 45½ feet wide and accommodates three tracks, though the line originally had only two tracks.

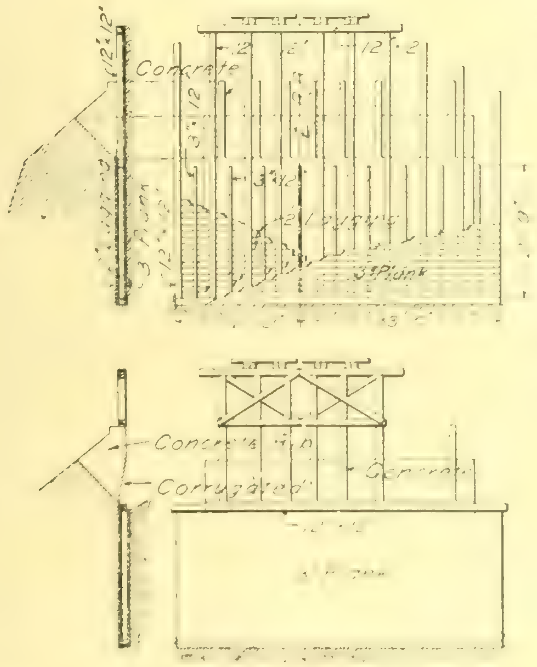
The scheme of construction adopted utilized the existing railroad embankment for the support of small concrete piers upon which the curved joists of the centreing rested, thus dispensing with any trestle work to carry them. The trestles for the temporary support of the tracks over the arch also rested upon these piers until the arch voussoirs constructed between the bents had seasoned. Cribbing was built on the voussoirs up to the temporary track stringers. The track loads were taken on blocking on the voussoirs, and the trestles were removed, the openings thus left over the temporary supporting piers constituting the key spaces. In this way the arch was constructed without embedding in the concrete any of the trestle legs except those portions of the bents in front of the abutments which passed through the upper part of block 3. Moreover, costly and undesirable detours of the railway were avoided and much heavy falsework was saved.

The tracks on the completed bridge are at the same elevation as the original ones on the embankment, which was about 30 feet above the grade of the street.

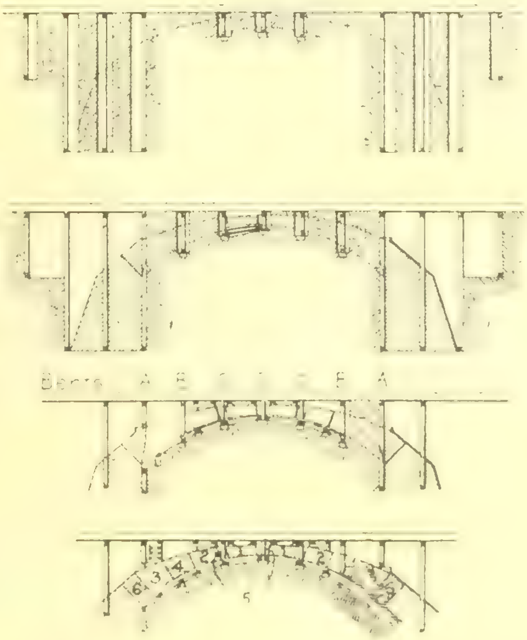
Operations were begun by putting two 12 x 16-inch stringers under the ties beneath each line of rails, following this work by sinking trenches, transversely to the tracks, in which the timber bents were to be set for carrying the railroad. The trenches were placed about 13 feet apart, centre to centre.

The bents consisted of 12 x 12-inch yellow pine posts approximately 5 feet apart centre to centre with a 12 x 12-inch cap and a 6 x 12-inch or 12 x 12-inch yellow pine sill. The sill rested on a temporary concrete pier, from 24 to 36 inches wide, and 18 inches high, which also served as a support for the 3 x 14-inch yellow pine ribs of the arch centreing. These ribs were placed 12 inches centre to centre and carried 1½-inch lagging. An additional footing for supporting the centreing was added at each haunch, and the pier nearest the abutments had to be 4 feet high in order to engage the ribs.

When the trestles at the abutments had been completed the main body of each abutment was built up to the springs, and on each abutment were built seven concrete piers 12 inches thick. These piers or ribs served a double purpose, that of providing support for the track trestle above the front of the abutment when the lower part of the trestle legs should be cut out for



Supporting Track on Concrete Ribs.



Method of Construction Employed.

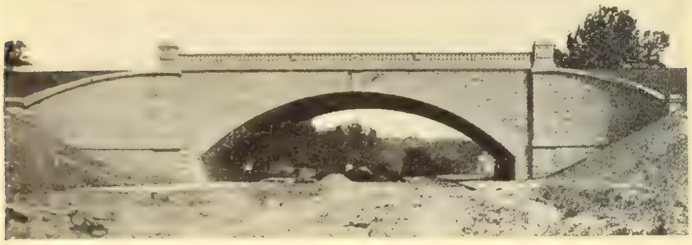
concreting key 6, and, second, of manitaining the key space 6 after voussoir 3 was cast, in other words, holding No. 3 against sliding downhill when its forms were removed preparatory to casting No. 6.

When the trestle over the arch was completed the spaces numbered 1, adjacent to the crown key, were excavated, the curved joists or ribs laid on the trestle piers, the lagging laid in the ribs and side and end forms erected. Each voussoir was then cast in one piece the full length of the barrel of the arch, 45 feet.

The same procedure was followed with the other voussoirs which were cast in the order of the numbers shown on the diagram.

As soon as block 1 had been set sufficiently, cribbing was placed on them up to the stringers to take the railroad load, and the earth was then excavated between bents C and D and the next blocks, No. 2, were cast. They in turn carried blocking after setting, and finally the remaining earth was excavated, blocks 3 poured, and cribbing placed on top of them to engage the stringers, thus leaving the tracks completely carried on the main voussoirs so that bents B, C and D could be removed and blocks 4 and the keys 5 could be cast. Finally blocks 6 were placed, closing the arch.

The temporary concrete piers for supporting the trestle bents and the arch centreing were subjected to the action of train loads during the construction of the centreing, and thereby were settled to pretty firm bearing before any concrete was laid on them. They were set 2 inches higher than final elevation to allow for such settlement.



View of Completed Structure

The faces of the buttresses built on the abutments were corrugated in order to make them effective afterwards as part of the arch rings. The buttresses were finally concreted in by key 6.

When the arch was completed and carrying the trains the earth beneath was excavated, thus removing the piers and releasing the centreing. The soffit of the arch was bush-hammered as the excavation and removal of centreing proceeded, the top of the excavation serving as a scaffold. The faces of the abutments were also bush-hammered after the removal of the core and centreing, it being, of course, impossible to remove the face forms in time for scrubbing as was done with the exterior surfaces.

Notable Tower at Halifax, N. S.

Work on the construction of the Halifax tower on the site of 100 acres, given by Sir Sandford Fleming for the purpose, and commemorative of the establishment of representative government in Nova Scotia 152 years ago, will commence shortly at Halifax, N.S. The tower will be more than 100 feet high and wil command a wide view of sea and land.

In addition to the contributions that will be received from the various governments, the province of the Canadian Confederacy, the governments of Australia, New Zealand, United South Africa, Newfoundland, and other states will present sculptured stones with armorial bearings for the interior wall decoration. The stone used for this purpose will be brought from quarries in the different provinces and dominions, and will be natural to those localities. Granite from the Yukon may be used and it is possible that Nova Scotia freestone will also take an important part. The merits of the last named material are discussed in this issue, in an article relating to the quarries of the Sackville Freestone Company, of Sackville, N.B.

Cork floor slabs, compressed from an original thickness of 14 inches to less than ½-inch, are being tried on one of the new steel dining cars of the Pennsylvania Railroad.

Chief Engineer Lafleur, of the Department of Public Works, Ottawa, in his annual report draws attention to the growth of the West and emphasizes the necessity for paying greater attention to public works in that part of the country. The annual expenditure will have to be increased to keep pace with the development.

The building returns from Victoria, B.C., up to the middle of September, represented a total vale of $1,725,680 compared with $1,673,420 for the whole of 1909. This is an increase of $52,260 over the largest total for any year in the history of the city. Building is still very active at Victoria, and it is expected that the figures will reach the two million dollar mark by the close of the season.

Extensive contract work is under way at Vancouver, this being more especially in the way of paving and sewers. The progress made on these works has been very slow this fall, and City Engineer Clement, has notified the contractors that the penalty clauses will be enforced if the work is not delivered in time. The Board of Works will make an investigation, and Mr. Clement will report on all contracts that are behind time. A shortage of labor is stated to be materially responsible for the delay.

The Berlin, Ont., Board of Trade were addressed recently, by Mr. A. W. Wright, who pointed out the importance of immediate steps being taken in order to keep the Northwest carrying trade on an all-Canadian route. Otherwise it would go by way of the improved Erie Canal, which would be completed in five years. He argued that even were the Georgian Bay Canal built, a deepened Welland Canal would be required to provide for return freight, which naturally would go by way of the lower lakes. The cost would be $20,000,000, but the total for the deepening of the whole system, including the Welland and St. Lawrence Canals, would be seventy or eighty millions.

It is stated on the authority of Sir Robt. Perks, the British engineering contractor, who was in Ottawa recently, that in all probability a new dry dock, estimated to cost $4,000,000, will be erected shortly at Levis, Que. The construction of the dock has been entrusted to Sir Robt. Perks' firm. The plans, which are now ready to submit to the Government, provide for a dock 1,000 feet in length, 130 feet wide at the coping, 100 feet wide at the entrance and 36 feet wide at the sill. This is 250 feet longer than the present Admiralty dock now building by the Government at Rosyth in Scotland, 75 feet longer than the Canada dock at Liverpool, and 150 feet longer than the Avonmouth dock at Bristol.

General Principles of Steel Construction

Economy the First Motive—Importance of System in Planning and Erection Careful Study of Conditions Essential—Notes on Manufacture and Shopwork

The object of the design should be to obtain the best result for the minimum amount of money, and this can only be obtained when the different building materials are employed to their greatest advantages. It is obvious that the steelwork, brickwork, and stonework must be designed simultaneously, in order that no material should be wasted.

Good practice is to use a safe stress for steel equal to one-quarter of the ultimate strength of the material, or 7½ tons per square inch, if the ultimate strength of the material is 30 tons per square inch. As the elastic limit of medium steel is about 15 tons per square inch, the actual factor of safety will be two.

The general lay-out of steelwork for a building is primarily dependent upon the size of rooms and type of floor construction; secondly, upon loads to be carried and requirements as to decorations. The spacing of columns should be uniform if possible, in order to permit repetition of sections and details.

Loads.—The actual live load is not used in the calculations, but the corresponding dead load which would cause the same stress in the steel as the actual live load.

This dead load is usually referred to as "superimposed load," and varies from 70 lbs. to 120 lbs. per square foot for apartments, houses, hotels, and office buildings, and from 150 lbs. to 400 lbs. per square foot for warehouses and factories. To the above loads should be added the weight of the floor itself (including steel girders and beams., which is about 100 lbs. per square foot for an average concrete floor. The dead load of floor must be carefully calculated in each particular case.

Steel may be used in a building for the following reasons: 1. By necessity. 2. For economy. 3. For fireproofing.

Steel may have to be used in buildings where the design will not permit of the use of only brick and stone work on account of large rooms, great loads, architectural features, or planning requirements. It is used by reason of economy, where steel is found to be cheaper than any other material, or where the floor space saved by using steel columns instead of brick wall or piers will more than compensate for the extra cost of steel compared with the cost of brick.

Steel beams and concrete are substituted for wooden joist floors and roofs in order to obtain a more fireproof constructin, often to a considerable increase in the first cost of the building. However, the fireproof building may be more profitable to the owner than the old wooden construction, when the reduced insurance premiums and the increased rigidity and stability are taken into consideration.

No doubt fireproof construction will soon be adopted generally for large towns, and I will, therefore, in this paper only deal with that kind of construction.

In addition to the before-mentioned reasons for using steel in buildings, there are others more or less important according to conditions or circumstances: 1. Rapidity of construction. 2. Possibility of changing the arrangements of rooms after the carcase of the building is completed. 3. Increased stability and rigidity; uniform distribution of loads on foundations to prevent unequal settlement.

Rapidity of construction is generally a question of economy. By speedy completion of the building, interest on the capital is saved.

Possibility of changing the arrangement of rooms saves cutting away brick walls and putting in steel girders to suit the client's requirements. Such alterations of rooms may in many cases increase the value of the building. A steel-framed building, where steel is properly covered with protective material, is, I believe, the most durable fireproof building that can be produced at reasonable cost.

Difference Between Brick and Steel Construction.—Let us compare the setting out and construction of a brick building and a frame building.

The setting out of a brick building need not be very accurate as to dimensions. The accurate dimensions of the site are often not ascertained before the old building is taken down, and the builder is ready to start work building the walls.

A little variation between the dimensions scaled from the drawings and the actual dimensions of the site wall will not present any great difficulties or cause delay or additional cost. The dimensions can simply be agreed upon between the builder's foreman and the architect's representative on the site.

It is neither necessary to have particulars of details when starting the work, as cutting away of little brickwork is not accompanied by any great difficulty should it be found at a later date that some alterations were necessary on account of some of the detail drawings not being ready when the work was commenced.

In the case of a steel structure, however, it is most essential that the drawings are completely worked out beforehand, and all details made.

Ventilation, heating, drainage, lighting arrangements, etc., should be set out beforehand, and the general lay-out and steel plans made to suit the different requirements.

Economy.—Economy is the essential thing to aim at, and, generally speaking, steel is being used in buildings because it admits of cheaper construction than other materials, and at the same time ensures a reliable structure.

By the use of steel the rental floor space is increased considerably; it also permits the use of large spans and less pillars, thereby enabling the future tenants to arrange the rooms according to their requirements.

Buildings can be quickly erected and completed, thus saving interest on capital.

In order to obtain true economy, however, it is necessary that the planning and designing, and also the method of carrying out the work should be systematical, and in accord with the general principles which I will deal with hereunder.

Systematical Progress of Work.—The steelwork plans should be ready several months before work can be started on site, to allow for the time required for the manufacture of the steelwork at the mills; also, it should be borne in mind that the steel can be obtained at a smaller cost if ample time is allowed for the steel contractor.

It is advisable to order the full quantity of each section in one lot, and get the pieces cut to exact lengths at the mills. Considerable waste occurs if the shop has to draw material from stock. To take material from stock should only be permitted when very quick deliveries are absolutely essential.

Generally speaking, complete dimensioned shop drawings should be made in the office in preference to setting out the rivets, connexions, and details by workmen in the shop.

It is, of course, necessary for the engineer in charge of making the detail drawings that he [illegible] have a [illegible] staff of draughtsmen who are thoroughly familiar with shop work, as the draughtsmen are called upon to [illegible] [illegible] the template making would otherwise be [illegible] [illegible] and practice. [illegible] [illegible] detail drawings, and nothing should be left to the judgment of the workmen in the shops.

More reliance can be placed upon drawings which have been checked than upon setting out in the shop, which setting-out is not usually checked.

Another advantage of having complete shop drawings is that every piece can be inspected and compared with the detail drawing, and errors in shop work can more easily be detected than if the work is set out in the shop without shop drawings. Every piece can be made complete to the detail drawing without fitting the different pieces together, and still they must fit perfectly when erected. The essential thing to remember in steel construction is that there should not be any alterations of the steelwork on the site.

Alterations During Construction.—It is a very serious proposition to make alterations to the steel designs during progress of manufacture, and still more during erection. Not only will it incur delay and additional cost, but also less satisfactory work. Alteration work cannot as a rule be so well made as is possible if the original design was carried out. Records are difficult to keep and inspection is unreliable. If all drawings are properly worked out and completed before work is started, the possibility of alterations is materially reduced.

We will now follow the progress of manufacture of the steel from the date the steel-work drawings are ready and handed to the steel contractor.

Manufacture.—The first thing the contractor has to do is to issue orders for rolling of the material. An inspector will be appointed by the architect or engineer to inspect the quality of material at the place of manufacture.

The inspector will be at the mills when the material is rolled. He will be present when the chemical and physical tests are made, and make records of the results of the tests, and order additional tests to be made if the material does not run evenly.

The inspector will reject and order such material to be removed which will not meet the requirements of the specification, and stamp and approve such which is satisfactory.

The approved rolled material is stamped with the inspector's mark of approval or quality of material. Any piece coming from the rolls is stamped with the blow or melt number, and this number is referred to on the test sheet reports. Great care should always be taken to have the melted steel well mixed before it is put into the ingots. Every piece is also marked with an identification number given on the detail drawings. This number is used for reference when consulting the drawings in the shop, or when locating in which place the piece is to be erected on site. After being rolled and straightened the material is placed in the stockyard until required in the shop. As a rule the material cannot be rolled in the order it is required in the shop, but in such order as the rolls go in according to the rolling programme for the rolling mill. Weeks, and often months, may elapse before the same section is rolled again. It is often, therefore, advisable to roll the beams for the roof at the same time as for the lower floors, when same section is used. In the shop, however, the material is usually fabricated in the order as it is required on the site. The inspector is kept well informed as to the dates of rolling and manufacture, so that he can be present and inspect as required and as the work proceeds.

Shopwork.—From the stock yard the material is brought to the working shop, and skilled workmen mark on the position of the holes, lines of cutting, etc., on the steel pieces direct, with or without template. The number of the shop drawing and number of the job is often painted on the piece before it leaves the working shop, in order to assist the checker and inspector. Therefrom the marked material is brought to the drilling shop.

In the case of built-up sections, as, for instance, a column composed of angles and plates, all the angles and plates are not marked and drilled separately, but only a few holes are first drilled; the different plates and angles are then bolted temporarily together, and the whole thickness of metal is drilled through at the same time, thus saving time and assuring greater accuracy and all holes being true. Several drilling machines can be used for one member at the same time. Burrs are removed after the drilling, and the ready-drilled piece is sent to the assembly shop. Some pieces are milled or ground to fit; the different pieces forming one member are temporarily bolted together and sent to the riveting shop.

During assembly, the detail drawings are consulted and dimensions checked.

When the pieces are rivetted they are sent to the milling machines if any part has to be machined, such as ends of columns or bearing plates on girders.

Before assembling some surfaces must be painted, as after assembly they are inaccessible. Open holes which are to be filled with rivets in the field are marked by the assembler, so that such holes shall not be filled in by rivets in the shop. Holes in small pieces and brackets are generally punched and rimered after assembling, but main members are drilled. Before the finished steelwork is painted it is examined by the inspector, and all dimensions are checked. Ends of compression members which are machined must be examined, and it is ascertained if the ends are square to the axis of the member. If all measurements are correct, and the workmanship is satisfactory, the inspector stamps the piece with his shop inspection mark.

The material will not receive its shop coat of paint or oil before shipment.

Marking.—Any piece or bundle of pieces must not be shipped unless having the following marks applied:—1. Blow or melt number. 2. Identification number. 3. Mark of mill inspection. 4. Mark of shop inspection. 5. Shipping mark.

When painting the material before shipment, all marks made in the shop are extinguished, except those above stated. A small circle or triangle with white paint is made around the marks previously indented by stamps. The shipping mark and the identification mark is applied by paint in large and distinct letters or figures. Sometimes pieces for different parts of the building are painted in different colors, or a spot or ring of a distinguishing color is applied to facilitate selection of the material at erection. If the above described methods are used, little or no difficulties will arise at erection, and no risk is taken of material arriving at the site incorrect. The inspector makes remarks on his copy of the shop drawing when approving any piece at the time when his stamp of approval is applied. He has also to see that the material is shipped in the right order as required on the site. After completing inspection for each lot, he makes up a proper list of materials. The works do likewise, and the two lists are compared and checked. Several days before a shipment is made the shipping statement is written out in detail, and instructions are issued for shipment or transport of the material to the site.

As the material passes out of the works it is weighed, and the inspector records the weight and counts the pieces weighed, and sees if they are in agreement with the advice of shipment. The weighing machine should be checked at regular intervals by an independent party to assure that it registers the correct weight.

The shipping statement, advice, and invoice is now sent to the contractor as the material is shipped, if the contractor only buys the material but executes his own erection.

Shipment.—According to requirements the steel is transported on van, railway car, or barge, or by ship. Considerable damage to the material may occur during transport if proper precautions are not taken against careless handling when loading and unloading, so that small pieces are not bent or crushed by large or heavy pieces placed on top.

Delay, mixing up of the different consignments, is a source of great inconvenience, and prevents speedy and methodical erection.

Erection.—The material is usually brought alongside the building on vans, and is hoisted by the erection cranes to a place on the building near to where it is to be erected, or sometimes directly placed in its final place. The different pieces are first temporarily bolted together and afterwards set to correct level and made plumb, after which all holes are filled with rivets. The steelwork is painted immediately after erection, and if more than one field coat is applied, different colors of paint should be used. Floors and walls are built and fireproofing applied. The erection of the steelwork should be two storeys ahead of the floors. The floors should be put in one storey ahead of the walls, as may be convenient. In cases where the walls partly support the floors or girders, the walls must, of course, be built the same time as the steel is erected. In order to prevent accidents to the workmen below, the floors should be put in close to the steel erection, or the floor framing should be boarded over to prevent any tools or material falling on the men below. At the same time, the different trades should be kept separate, so as not to interfere with the rapid progress of the work. When the carcase is complete and the roof is on, heating, ventilation, etc., are installed, partitions built, and joinery and finishing completed. In the carrying out of a large job it is not always satisfactory to put the responsibility on to different parties for designing, detailing, manufacture, inspection, and erection.

In my opinion, one man should be responsible for the systematic carrying out of the work.

The engineer responsible should bear in mind that no work is satisfactory unless the following requirements are fulfilled: 1. Economic and safe design. 2. Good material and workmanship. 3. Correct work as to dimensions. 4. Prompt deliveries. 5. Proper erection.

Satisfactory design can only be obtained by making a special study of the conditions and preparing accurate drawings and calculations. Good material can be assured by tests and inspection. Correct work can be obtained by systematic working and supervision.

Prompt delivery is dependent on each portion of the work being ready in schedule time. Careful watching of each department is necessary, particularly at the early stages of the work. It is wrong to suppose that after a good design and specification are made, the responsible engineer's work is done. A good specification is of little use without inspection, as a clever design without proper shop drawings.

The practice of taking a few test pieces from a job and sending them to a testing firm is not reliable, and is more deceiving than convincing. It may be that the test pieces selected will show good results, while material in other parts of the structure is bad. The material should be tested at the mills during the progress of manufacture. As I have previously said, satisfactory results can be obtained by the use of steel for buildings if the architect and engineer work hand in hand, and the work is carried out systematically in all details.

Calculations and Preparation of Plans.—When preparing plans and calculations for a building, the work should proceed in the following order:—

1. The specification drawn up for stresses and loads.
2. The principal members for the structure to be calculated, and it should be ascertained whether the setting-out of the columns and girders is economical and reasonable, and, if necessary, such modifications made as will improve the construction.
3. When the architectural plans are completed, the engineer will calculate all the loads of floors, walls, etc.; make stress sheets for each member, after which a set of plans is made and the required sizes given. The sizes of the steelwork thus obtained are drawn to scale on the architectural plans, and, where necessary, the engineer will modify the sections to suit architectural requirements; after which the architectural plans are practically completed, the shop drawings made, the contract placed with the steelwork contractor.

Good Fall Prospects at Ottawa

Activity in Commercial Building—Satisfactory news concerning labor situation and supply market

Ottawa, October 1, 1910.

Building in Ottawa this fall will be confined largely to commercial structures. The number of medium-priced and cheap houses built during the next few months will be smaller than last year. The commercial building, however, far exceeds other years.

Between four hundred and five hundred men will be employed all winter on the Grand Trunk hotel and station alone. Then the Blackburn building (a description of which is given below), the Rosenthal building and the Hope building, are all large fireproof constructions, which will take at least the winter, and, in some cases, most of the summer to complete. There are also a number of smaller buildings, including the Masonic Temple, Matthews building, City Fire Station, Slim-Shouldis factory, to be built very soon.

The labor situation is excellent just now. With the exception of a few plumbers on the Cateau Laurier, who are on strike, as a result of the strike in Montreal, there are no labor disputes.

There is a scarcity of the lower-priced labor which will be marked from now until the corporation works close down, on account of the frost. This is due to the overlapping of the season in the lumber camps, and the esason in the corporation work. The City Engineer's Department has about eight hundred men employed at wages ranging from $1.80 a day to $4 a day. These works mostly close down as soon as frost interferes, while the lumber camp season opens on Oct. 1st, when several hundred men leave the city for the "shanties." The demand for skilled labor about equals the supply.

There promises to be little change in building supplies this fall. Coarse lumber has gone down a little, but the better qualities are even stiffer than ever, about levelling things up as far as the local market is concerned. Cement is steady now, the firms in many cases guaranteeing no increase this fall. Prices range around $1.85 per barrel, according to quantity. Cartage remains as high as in the spring, from $4.50 to $5 for a team and man. There is a sufficient supply of all materials.

Tenders will be called very soon for the Government departmental block on Mackenzie Avenue, but it is not expected that work will be begun until next summer.

Tenders are being called for the Blackburn building, corner of Sparks and Metcalfe. The entire size of the building will be 132 feet by 91 feet. It will be built in three sections in order to accomodate the tenants occupying the buildings at present on the site. The first section will face Metcalfe Street, and will be 45 feet frontage and 89 feet deep. It will have a basement and seven storeys. The construction will be fireproof steel, and will be strong enough to carry three more storeys, when such an addition is desirable. The facing of the building will be of Stanstead granite or marble. The other sides will be brick. All the floors will be of reinforced concrete. The main floor will have a ceiling 16 feet high, the basement 14 feet, and the other storeys 10 feet 6 inches. The main floor will be utilized as a restaurant and cafe, and the other floors for offices, etc. Mr. W. E. Noffke is the architect.

The Matthews building on the corner of Rideau and Mosgrave will be 36 feet 6 inches by 90 feet, and will be three storeys with a basement. The construction will be semi-fireproof. Mr. W. E. Noffke is architect.

The plans for the Masonic Temple on Metcalfe Street have been approved. This building will have 60 feet frontage and will be 95 feet deep. It will be of steel fireproof construction, with all sides of brick. Mr. J. A. Ewart is the architect.

Winnipeg Makes New Record

Adds to itself in nine months a city greater than Brandon — Trade Conditions and Prospects

Office of the Contract Record,
Winnipeg, Sept. 30, 1910.

Building activity, as a result of the culmination of labor disputes, has resumed the briskness which characterized Winnipeg since early spring, and owners, architects and contractors are now working overtime. The anxiety is now for the completion of outside work before winter sets in. If the season should prove no more severe than last winter, there will be little cause for worry. In this there is an element of chance, which builders are not prepared to accept, and every available man is now being pressed into service by the building trades. If an early winter sets in the result will be serious and will handicap brick and concrete structures. Contractors had carefully estimated the time on their hands to conclude work with safety, but they failed to anticipate the lockout of bricklayers and masons. If a number of works are left over until spring, it will be attributable to these sources.

The quietness which prevailed in architects offices during the strike has given way to genuine activity.

Winnipeg, in less than nine months of this year has added a city of greater proportions than Brandon, the second city of the province. Building permits have passed the thirteen million dollar mark, and the total cost of construction work done in the city this year is over fifteen million dollars.

To have built a city within a city is evidence of the activity of contractors and architects this year. Brandon is a city of almost 20,000 people, yet the buildings which have been erected here this year, would house that population and provide space for all its factories, stores and commercial, as well as financial, interests.

It is improbable that Winnipeg will have any more really large structures this year, but the building total will pass up to nearly $17,000,000 before the close of 1910.

Already possibilities for next year are being talked about. The permit for the Bank of Montreal, will probably be the first issued. The Hudson's Bay Company and the Herrod interests, which have amalgamated, are stated to be contemplating a mammoth structure here next year to compete with the Eaton Company for retail trade, and also to enlarge wholesale facilities.

The 8-storey struture for the Canadian Bank of Commerce will be started next spring. Work on removing the present bank building to Regina is billed to commence during November, and as soon as the ground is cleared the big local structure will go up. Darling & Pearson, Toronto, are preparing the plans for the new building.

L. B. Merriam and H. J. Symington, contractors, have issued a writ against the Parks Board, of Portage la Prairie for $13,600, which they claim to be due for damning the river. Their claim is based on the alleged faulty specifications of the engineers. The contractors claim $5,110, the amount of the final estimte which was withheld by the board after it had been passed by the engineers; $490.84 which was retained by the board for engineers services, the contractors claiming that this was forfeited on account of the delay occasioned in the engineers altering their plans, a claim of $8,000, because the blue prints of the river bottom were faulty and therefore the specifications could not be followed out. In the alternative the contractors will accept $14,055.92, being the balance for work done and material supplied.

It is understood that Mr. Allen Hazen, the water purification expert, in his report on the Ottawa water supply, which will be ready in a week or so, will recommend that the city draw its water from McGregor's lake. McGregor's lake is 14 miles from Ottawa, north of the river. The engineering difficulties in the way of laying water pipes down to the city are great, but by no means insurmountable, and it is said that the cost would not be so great as it would appear. The greatest difficulty would likely be found in laying the pipes under the Ottawa River. Mr. Hazen's report will probably be received in Ottawa before Oct. 15.

Canadian Railroad Development

The contract for the clearing of the right of way and grading of the Cowichan Lake branch of the Esquimalt & Nanaimo R. R. has been let to the contracting firm of Janse, Macdonnell & Timothy, who are building the Alberni branch of the same railway. This branch is to be ready for traffic early next summer.

Advices from Victoria, B.C., state that the Canadian Northern Railway has signed the contract for the construction of the first section of its railway on Vancouver Island, giving connections from Victoria to Barkley Sound, in accordance with the terms of the contract with the Government. The first section is about 30 miles long, and runs to Sooke.

Advices from Belleville state that Andrew McGuin, contractor for the three miles of the Canadian Northern Ontario Railway, Toronto-Ottawa line through that city, has started on active construction work west of the river. Grading has also been commenced at Trenton, and operations will soon be general on the sub-contracts between that town and Belleville.

The City of Toronto, has had work started on the construction of the new industrial spur line along the east bank of the Don to Ashbridge's Marsh. E. L. Cousins, railway engineer, formerly on the Grand Trunk staff, is in charge. The line will be used by the three railway companies on equal terms, and will be operated by the companies alternately, for periods of one year, but the city retains control for all time.

Work has been progressing for the last two months on grading and ballasting the roadbed of the Temiskaming & Northern Ontario Railway, of the Canadian Government. Trestles have been filled in and many miles of track have been raised. During August 1,501 cars of ballast were taken from the Redwater Pit, 2,674 from the Cassidy Pit, and 1,415 cars from the Wataybeag Pit. Along the section between Cobalt and Haileybury, which has been double-tracked, 1,398 carloads of ballast were used.

Officials of the Hudson Bay & Pacific Railway have been advised from London that all the money necessary for the construction of the proposed line was ready, and that work should be rushed. In addition to building a line from Prince Albert, Sask., to Hudson Bay, it has been decided to build southwesterly to Pacific Junction, Mont., to a connection with the Great Northern R. R. This latter line would lead to the belief that James J. Hill has become interested in the project. George Atwood, Prince Albert, Sask., is chief engineer.

The Dominion Railroad Commission has ordered the building of a subway under the C. P. R. tracks at Broad Street, Regina, Sask. The plans are to be filed within 60 days and the question of the apportionment of cost between the railway company and the city will be settled by the commission after the plans have been submitted. The proposed subway, it is stated, will be one of the largest of its kind in the west, providing, as it will, according to the commission's order, for 19 tracks. The superstructure to carry these will be 400 feet in length. About 950,000 lbs. of steel will be required for the superstructure. While no official estimate of the cost has been made, it is said that the undertaking will

SOLE CANADIAN AGENTS

STOTHERT & PITT

Travelling Cranes, Hoisting Machinery and Harbour Equipment

General Electric Co.
Limited
London, England

Electric Motors

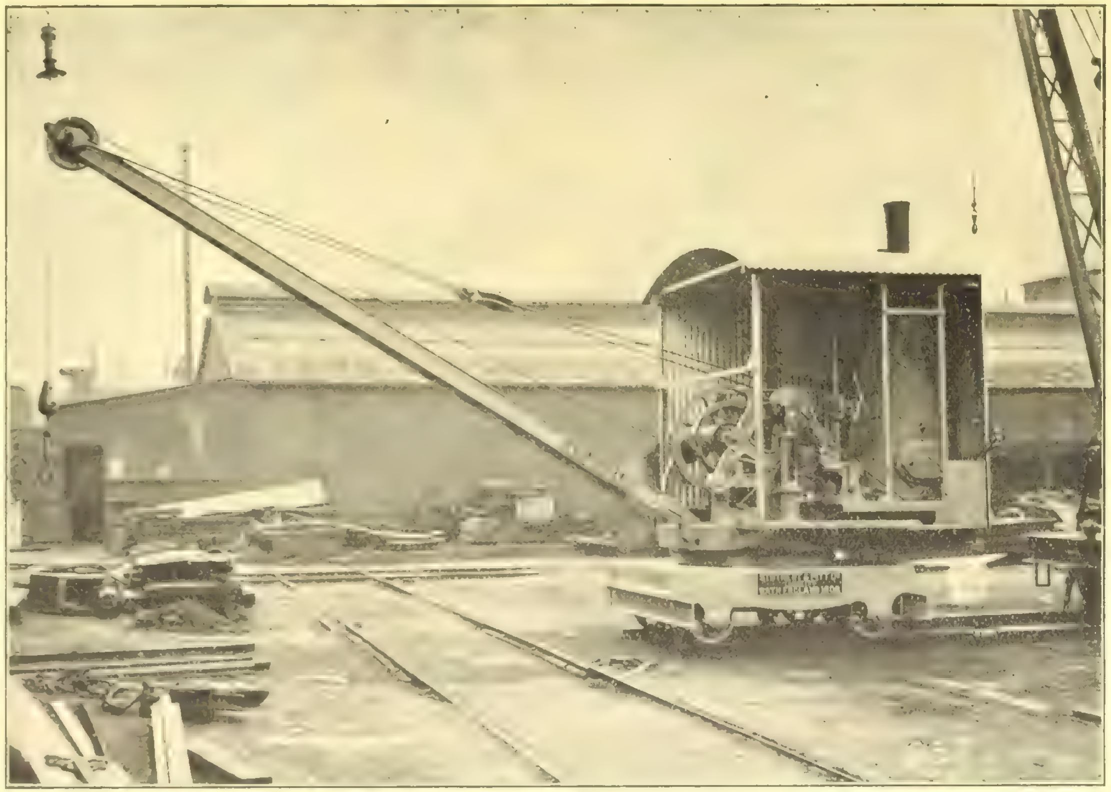
Generators

Electric Supplies

Incandescent Lamps

Osram Lamps

etc., etc.



Pirelli, Ltd.
Milan, Italy

Insulated Wires and Cables

Lead Covered

Armoured

Submarine

Underground

Paper or Rubber Insulated

Oxy-Acetylene Welding Apparatus, Sherardizing Process of Rust-Proofing Metals, Babbit Metals, etc.

Factory Products, Limited - - Toronto

H. G. NICHOLLS, President

FRED NICHOLLS, Jr., Secretary

involve an outlay in the neighborhood of $250,000. J. E. Schwitzer, Winnipeg, Man., is assistant chief engineer of the Canadian Pacific.

The Canadian Northern Railway (T. Turnbull, assistant chief engineer, Winnipeg, Man.), will call for bids during October for the construction of its line between Chilliwack and Lytton, at the junction of the Fraser and Thompson Rivers, a distance of about 90 miles. This will consist mostly of heavy rock work along the south bank of the Fraser River, including the canyon. Owing to the facilities afforded by the Canadian Pacific Railway the successful tenderers will be able to get in outfits and supplies at comparatively little expense, and undertake construction simultaneously at many points. Mr. Mann, president of the Northern Construction Company, of Winnipeg, is expected at Vancouver shortly, and will go over the route preparatory to submitting a bid. His company recently secured the contract for building the first 60-mile section between Port Mann and Winnipeg. The Canadian Northern, with regard to the second contract, will stipulate that construction work will be proceeded with during the coming winter. It is estimated that a large portion of the line through the Fraser River canyon will cost $100,000 a mile. It is probable that tenders will also be called this fall for the 90-mile section extending north from Kamloops, through the valley of the North Thompson. Early next summer will see under contract the entire section between Yellow Head Pass, at the summit of the Rockies, and tidewater at Vancouver.

Personal News and Notes

During the first three weeks of September the building permits issued at Calgary, Alta., represented a total value of $525,000.

A by-law has been passed at Calgary, which renders it imperative for buildings five storeys in height to be constructed of fireproof material.

J. A. Ritchie, manager of the Quebec branch of the Ritchie Contractors Supply Co., left recently for Vancouver, B.C., on a combined business and pleasure trip.

Col. Ruttan, city engineer, of Winnipeg, will preside at a meeting of the Canadian Society of Civil Engineers, to be held at Montreal early this month.

Mr. W. S. Painter, the C. P. R. architect, is making a trip through British Columbia, with a view to ascertaining the need for enlargement of the company's hotels in that province.

Winnipeg's building returns to date total more than thirteen million. This is more than double the returns for either 1907 or 1908. The highest total on record was for 1906, when the figures were $12,625,950.

A tentative arrangement has been made between Mr. Angus Smith, city engineer, of Victoria, B.C., and the council of that city, whereby Mr. Smith will discharge the duties of his office for another six months.

Doctors Nasmith and Archibald, of the Provincial Board of Health, have been instructed to make a further test of the ozone purification plant at Lindsay. The results of the second investigation will be awaited with interest.

Messrs. Waddell & Harrington, of Kansas City, Mo., have been recommended by the Vancouver Finance Committee as consulting engineers for the city for a period of five years. The rate paid the firm will be 3½ per cent. of the total costs, and incidental expenses.

Mr. W. H Reynolds, who is well known in the electrical field, and who was formerly connected with the sales department of the Eugene F. Phillips Electrical Works, Limited, at Montreal, has been promoted to be western manager for that concern, with headquarters at Winnipeg.

At Victoria, B.C., there is a prospect for much building activity during the fall and winter months. An unusually busy season is assurred, owing to the fact that the contractors have so many orders ahead. The city building inspector has been working overtime issuing permits during the last month.

Mr. Alcide Chausse, city architect and building inspector of Montreal, was seriously injured last week while driving. His horse bolted while passing a concrete mixer, and Mr. Chausse was thrown out violently into the road. Mr. Chausse is well known as the Hon. Secretary of the Royal Architectural Institute of Canada

Factory Products Limited, Toronto, sole Canadian agents of Pirelli Limited, of Milan, Italy, have just been advised by their principals that they have been awarded the Grand Prix for automobile tires, at the International Exhibition, at Brussels. The company handling these tires in Canada will be a subsidiary company of Factory Products.

Mr. Cosman, a representative of the Raymond Concrete Pile Company, the firm which has the contract for the concrete piles for the high level bridge at Strathcona, arrived in that city last week. This firm drove the concrete piles for the C. P. R. bridge at Lethbridge, and also for the same company's structure across the South Saskatchewan at Outlook.

Mr. E. T. Nesbitt, of Quebec, president of the Canadian National Association of Builders', and Mr. J. H. Lauer, secretary of the association, addressed a meeting of the Winnipeg Builders' Exchange at Winnipeg last week. Organization is being effected in that city along the lines suggested by the Canadian manufacturers with a view to fighting the present labor legislation.

Mr. J. W. McCready, honorary secretary of the New Brunswick Union of Municipalities, has been advised that the Provincial Government will be represented at the convention to be held at Woodstock, N.B., on October 19 and 20. It is expected that Mr. A. R. Wetmore, chief engineer of the provincial department of public works, will read a paper on the construction of roads in rural districts

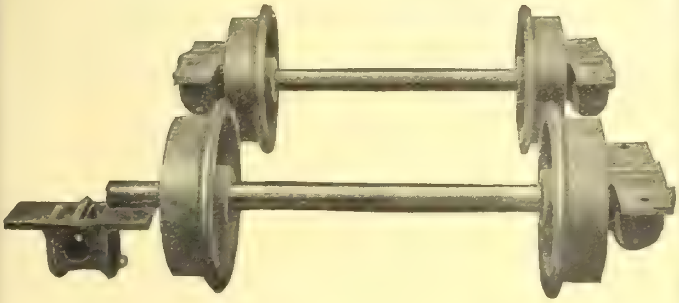
The Dominion Glazed Cement Pipe Company, Limited, which has located at Vancouver, B.C., seems to have a promising future. The president of the new concern is Mr. Jas. A. McNair; Vice-President, Mr. Thos. Duke, and the Secretary-Treasurer, Mr. Gregory H. Tom. The material manufactured by the company is a product of high quality for which there should be a good field. Concrete both for sewers and water mains is coming into increasing favor.

Investigation is being made by the Toronto Board of Trade with a view to placing at the disposal of the Special Committee on Harbour and Water Front Improvements the latest information calculated to be of service to the committee in the formation of their suggestions. The Board of Trade will support any application made to the Government for legislation provided the city adopt a satisfactory scheme for the improvement of the water front at Toronto.

Ambiguity in verdicts returned at coroners' inquiries are not uncommon, but the following, returned recently by twelve citizens of Cochrane, Ont., appointed to investigate the death of a workman killed by the collapse of a building in that town, is a rich example:

"We, the jury empanelled to enquire into the cause of the death of Wm. Ryan on the 17th day of September, 1910, find that the said Wm. Ryan, who came to his death by the collapse of the building on which he was employed, was fully responsible, yet proper precautions for safety were not taken by the contractors."

Build Your Own Cars Using Our Irons



Your cars will cost you less, and will be built just to your liking

We make a business of manufacturing car wheels, axles and boxes.

We employ expert, high-priced metallurgists to regulate the composition of iron in our wheels and get just the right chill.

We guarantee our car wheels to be strong, tough and well chilled, ensuring long service.

We make wheels any size, fit them to axles for any gauge track, and supply any style of box required.

Let us quote you.

Marsh & Henthorn, Limited

Makers of Hoisting Machinery **Belleville, Ont.**

Sales Agents: MUSSENS LIMITED, Montreal

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."

—The Philosopher of Metal Town.

"METALLIC"
Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

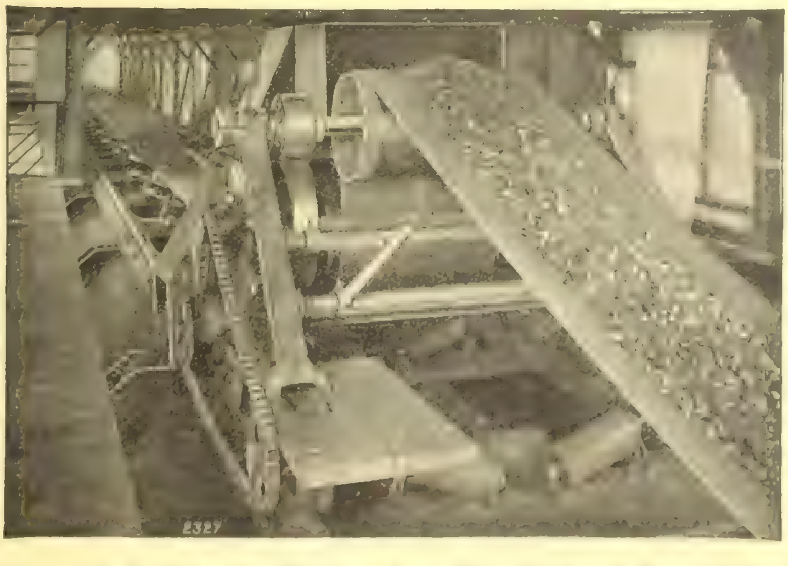
Manufacturers

1954

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

FOR TRANSMISSION AND CONVEYING



A 30" Extra Stout Scandinavia Belt in Operation Carrying Coal

A Solid-woven, Impregnated Textile belt.

Equally good in wet and dry places.

Not made in plies and will not come apart.

Made in three weights and in widths up to 60 inches.

WE GUARANTEE that this belt on a basis of price will give you better service than any belt on the market.

Write for Bulletin "A" and Discounts to

Federal Engineering & Supplies Limited

284 Yonge St. - TORONTO

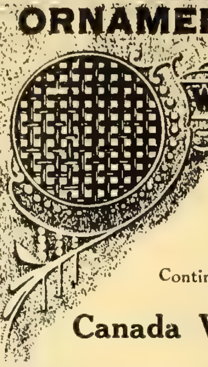
Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our prices on our

CONCRETE REINFORCEMENT

Continuous lengths or in sheets cut to size

WINDOW GUARDS

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone can only be procured from, and is manufactured solely by the

Corinthian Stone Company, Guelph

from the hardest substances available

Write the

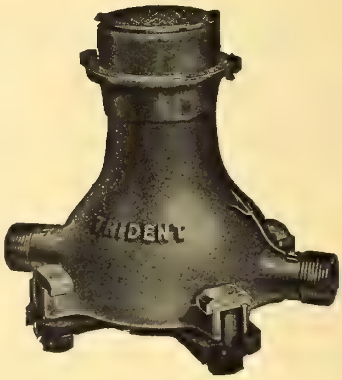
Corinthian Stone Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT Frost-Proof Water Meters

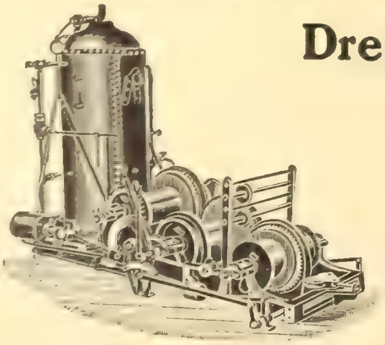
Write for Catalogue

Main Office - 90 West Street

New York City

M. Beatty & Sons, Limited

Welland, Ontario, Canada



Dredges - Ditchers - Derricks

Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

WE HAVE THE STOCK

ready for prompt shipment

Fire Clay
Fire Brick

Cement
Crushed Stone

Building Stone
Building Sand

Gravel, Screened, Pit Run and Pea Gravel

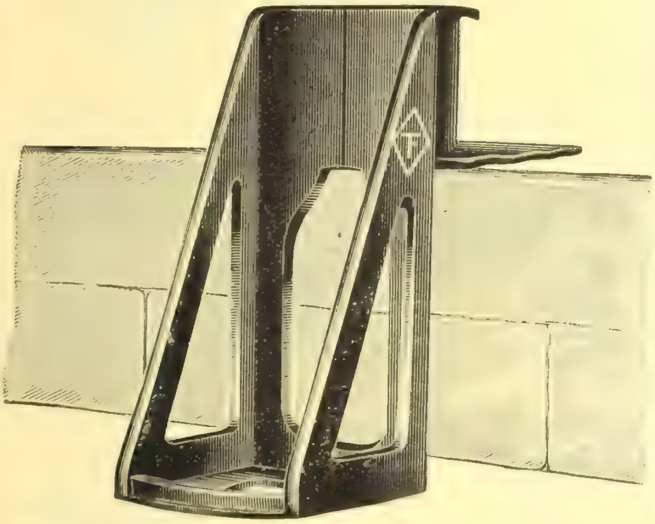
Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664 665 Evenings, North 2107 658

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

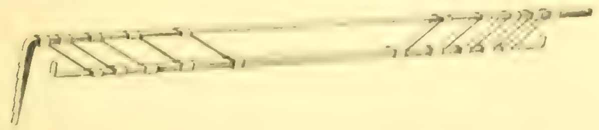
It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

Save from 25% to 50% of Steel
by using the
"Burrowes" Patented System of Reinforcement for Concrete

A perfect reinforcement for beams, girders, slabs, arches, retaining walls, culverts, circular conduits, concrete poles for power and telegraph lines, and every kind of concrete construction.



We will supply reinforcement fabricated, or will lease or sell rights. For further information apply to

SIDNEY BURROWES, Niagara Falls Centre, Ont.

Canadian Patent No. 771,76 Patented also in Great Britain and U S A

White Integral Supports

for Furring Bars

Make the best and most economical ceilings.
Immediate delivery can be made [illegible]

Dominion Fireproofing Co.

EADIE-DOUGLAS, LTD., Sole Agents

12 University St., MONTREAL, CANADA

Manufacturers and Contractors

Let the

New Liskeard Lumber Co.

Estimate on your next specification.

Squares and bill stuff a specialty.

Address Box 715, New Liskeard, Ont.

Blonde Lumber & Mfg. Co.
Limited
CHATHAM, ONTARIO

WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

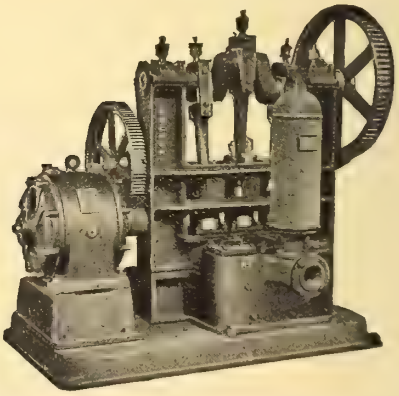
Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.
Coristine Building, **Montreal**
Phone Main 1054
Works: Seneca Falls, N.Y.

Harry Allen Jacobs,
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phones: Office 1217
Yard 4507

Sand & Supplies, Ltd.

TORONTO

Are You Interested in Good Brick?

Do you want to be known as a fellow who always uses the best? Then in future see that you specify

"Port Credit" Brick

It's strong, durable and has a rich red color that will please you beyond all expectations.

We are armed for Fall Orders

Port Credit Brick Co.
Limited

Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited

Phone 423 and 2457

HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks, SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

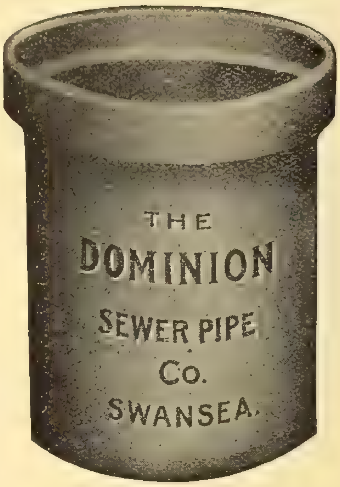
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed
Sewer Pipe
Standard and Double Strength

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

R. H. NEW,
Vice-President.

J. H. NEW,
President.

To do One Thing Best has been Our Desire for 50 Years, and To-day

we have our reward in knowing that

HAMILTON

Vitrified

Sewer Pipe

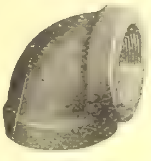
is known throughout Canada as the one line of SEWER PIPE that has proved to be absolutely reliable.

You can depend on our material, our loading and prompt delivery.

Prices always right. Let us show you.

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

These are Right



ELBOW

TEE

CROSS

IF THERE IS AN
S ON THEM **S**

We manufacture and stock a full line of Screwed and Flanged Cast Iron Fittings.

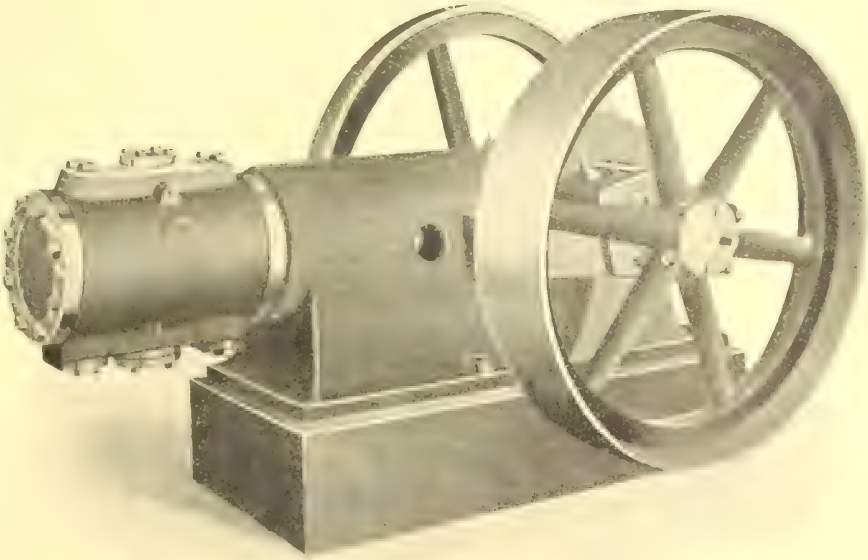
Send for a Catalog

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

Air Compressors

Single or Duplex Type

For Steam Motor or Belt Drive



The substantial construction and conservative rating of our compressors ensure efficient service under varying load conditions.

Canada Foundry Company, Limited
Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

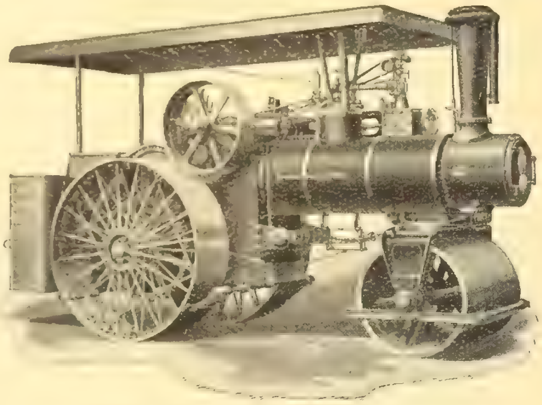
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

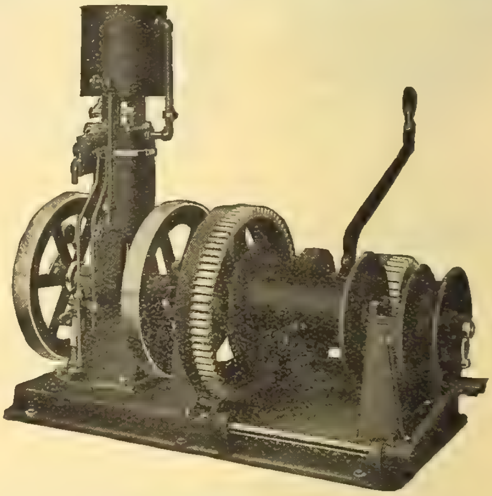
Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.
Hamilton, Ont.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Hamilton, Ont.
Three Rivers, Que. Midland, Ont. Londonderry, N.S.
St. Thomas, Ont. Fort William, Ont.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

ENGINES and BOILERS of all types and sizes Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

JAMES BRODIE & CO
Quarriers and Manufacturers of
Canadian Quinsy, Ebony and Stanstead Granite
Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty
IBERVILLE, QUE.

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER
GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, C. R. YOUNG, B. A. Sc.,
York County Engineer. A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Contractors

Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry,
Galt, Ont.

Municipal

Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i........	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to colo., 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

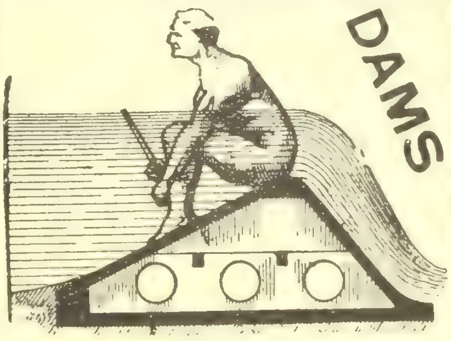
Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

VALUABLE SWING HOIST.

The Sasgen Circle Swing Hoisting machine is proving very popular among the contractors, there being over 1,000 contractors who are using from one to six of these machines, including a number in the Twin Cities. There is also a cement drain tile machine that works by hand and costs $50 that is claimed will turn out as many tile as power machines costing from $1,000 to $2,000 each. Nels Erickson, 406 Boston blk., Minneapolis, is agent for both these machines and will demonstrate their good points upon request.

The B. C. Gazette gives notice of the incorporation of the following companies: The Canadian Home Builders, Limited, capital $1,000,000; Canadian Mills & Timber, Limited, capital $1,000,000; Lincoln Sawmills Company, Limited, capital $[illegible],000; Electric Railway Construction Company, Limited, capital $600,000; Notch Hill Builders' Supply Company, Limited, capital $75,000; the Vancouver Sewer Pipe and Refractories Company, Limited, capital $[illegible]; the Bridge Lumber Company, Limited, capital $125,000.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

Established 1882
THE COMMERCIAL
The Weekly Financial, Commercial & General Trade Newspaper of the Great West.
Winnipeg Manitoba

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

New Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

The
"Simplex" Stone and Marble Cutter

This tool is furnished with adjustable blades for both freestone and marble, the blades being replaced when worn. The new blades are cheaper than sharpening the solid tools and save a lot of trouble. They give perfect satisfaction.

We also supply double tooth cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"

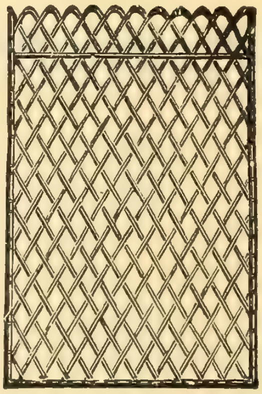
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples.

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

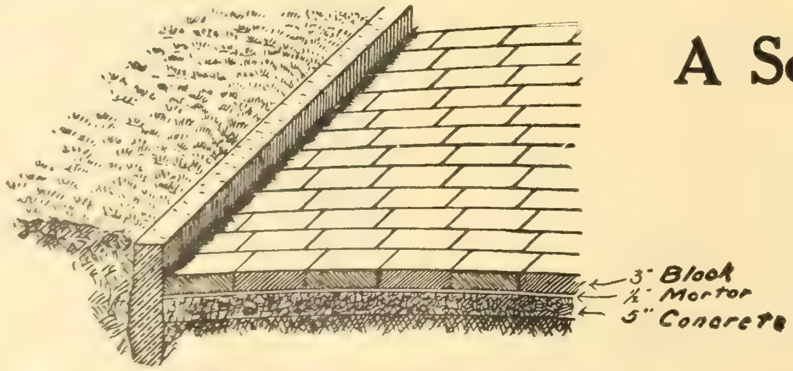
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

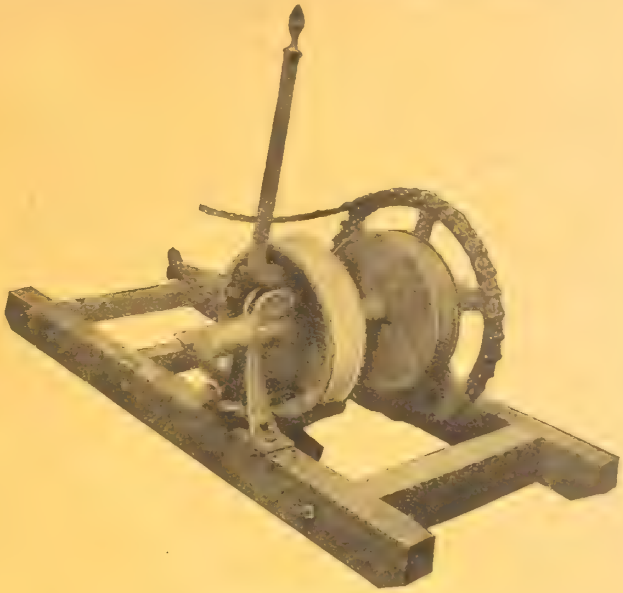
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists
London, Canada

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	368,320	123,242
32	Railroad Stations and Subways	838,301	192,192
56	Mills and Factories	669,539	1,075,713
17	Police Stations and Fire Houses	208,664	28,847
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.

Metropolitan Building, NEW YORK.

Local Agents in Montreal, Toronto and Ottawa.

We Manufacture

Frames - Sash - Doors

House Trim

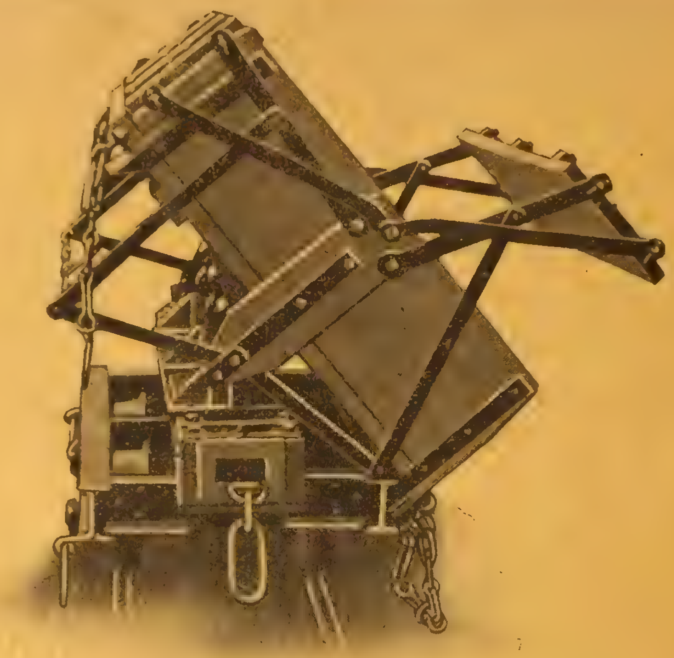
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



DUMP CARS

All Capacities For All Gauges
Prompt Shipment

Our Dump Cars will give you entire satisfaction. We can supply cars in all capacities for any practical gauge. Wheels are all properly chilled and the construction and material used are the best. Our cars are declared by steam shovel and car men to be superior to all others, both in construction and operation.

We supply cars with pressed steel channel archbrace underframe also wood underframe.

Let us have your enquiry, we would be pleased to submit full particulars and prices at any time.

F. H. Hopkins & Co.

Successors Late James Cooper
MONTREAL

Ritchie Contractors Supply Co., Quebec Dunn Bros., Winnipeg Ritchie Contractors Supply Co., Vancouver

Vol. 24 Toronto, October 12, 1910 No. 41

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

STEAM AND POWER PUMPS

PACKED PISTON PUMPS

For any service up to a water pressure of 150 pounds.

CENTRE OUTSIDE PACKED PLUNGER PUMPS WITH POT VALVES
Specially adapted for marine work.
AUTOMATIC FEED PUMPS AND RECEIVERS. COMPOUND DUPLEX PUMPS. INDEPENDENT JET CONDENSERS. CENTRIFUGAL PUMPS. OIL SEPARATORS.
All suitable for export. Write for Special Prices and Discounts.

THE SMART-TURNER MACHINE CO. LTD.
191 BARTON ST. EAST, HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

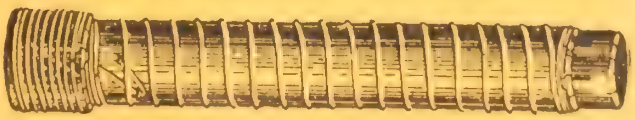
The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

We Also Handle
Bar Steel

Iron Finish Smooth Finish
Reeled

Lowest prices for satisfactory qualities

A. C. Leslie & Co., Limited
Montreal



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

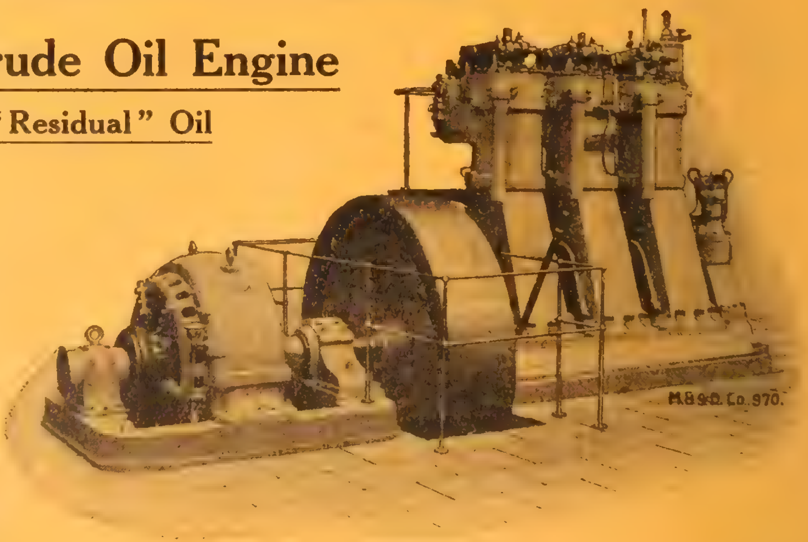
The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney

No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breaksdown
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canada Wire Goods Mfg. Co. 52
Dennis Wire & Iron Works 10

Belting

Federal Engineering & Supplies, Ltd 51

Boilers

Inglis, John 22
Jenckes Machine Co. 2
Leonard & Sons, E 59
Marsh & Henthorn 51
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co
Waterous Engine Works Co.

Brick

American Enamelled Brick Co.
Canadian Pressed Brick Co. 55
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co 54
Port Credit Pressed Brick Co. 55
Toronto Pressed Brick Co. 34

Bridges (Steel)

Canadian Bridge Co. 18
Cleveland Bridge Co. 18
Dickson Bridge Works 53
Dominion Bridge Co. 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware

Taylor-Forbes Co.

Cement

Alsen Portland Cement Co. 62
Britnell & Co 53
Bremner, Alex 59
Canada Cement Co 3
McNally & Co., W. 55
Morrison & Co., T. A. 60
Rogers, Alfred 4
Rogers Supply Co. 31
Sand and Supplies 55

Conduits Page

Conduits Co., Limited 53

Concrete Mixers and Machinery

Canada Foundry Co. 57
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F., H. 64
Jenckes Machine Co. 2
London Concrete Machinery Co. 21
Mussens Limited 32
Morrison & Co., T. A. 60
Rogers Supply Co. 31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co.
Canada Wire Goods Mfg. Co. 52
Hamilton Iron & Steel Co.
Trussed Concrete Steel Co. 5

Contractors' Plant

Beatty & Sons, M. 52
Factory Products Limited
Hepburn, John T. 17
H & E. Lifting Jack Co. 19
Hopkins & Co., F. H. 64
Katie Foundry Co. 61
Marsh & Henthorn 51
Mussens Limited 32

Crushers (Stone and Rock)

Hopkins & Co., F. H. 64
Jenckes Machine Co. 2
Mussens Limited 32
Morrison & Co., T. A. 60

Corrugated Iron

Galt Art Metal Co. 20
Metallic Roofing Co. 51
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 5
Roofers Supply Co. 59

Contractors Page

McIlwraith, Jas. A. 60

Drills

Beatty & Sons, M 52
Canadian Rand Co. 1

Deafening Felts

Cabot, Samuel, Inc. 55

Drilling Contractors

Harvey, J. 61

Dredges

Beatty & Sons, M 52

Engines

Canadian Boving Co. 2
Inglis, John 22
Jenckes Machine Co. 2
Leonard & Sons, E. 59
Mussens Limited 32
Waterous Engine Works Co.

Excavators

Harris, J. W. 11

Electrical Apparatus and Supplies

Factory Products Limited
Northern Electric & Mfg. Co.

Engineers (Civil and Mechanical

Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Farmer, John T. 60
Fuce, Edw. O. 60
Galt Engineering Co., John 60
Glaubitz, H. J. 60
Hunt & Co., Robt. W. 55
Inglis, John 22
Kennedy, Jas. C. 60
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H. 60
McRae, John B. 60
Moore & Scollan 60
Nadel & Adler 60

Fire Apparatus Page

Factory Products Limited
Morrison & Co., T. A. 60
Seagrave, W. E. 16

Fireproof Doors and Windows

Douglas Bros. 14
Mussens Limited 32
Ormsby, A. B. 5

Granite and Marble

Laurentian Granite Co. 60
Missisquoi Marble Co. 13
Rogers Supply Co. 31
Smith Marble & Construction Co. 53

Glass

Chance Brothers & Co.
Consolidated Plate Glass Co.
Luxfer Prism Co.
Thompson & Co., B. & S. H.
Toronto Plate Glass Importing Co. 1

Heating Apparatus

Jenckes Machine Co. 2
Leonard & Sons, E. 59
Taylor-Forbes Co.

Hoisting Machinery

Beatty & Sons, M. 52
Factory Products Limited
Inglis, John 22
Jenckes Machine Co. 2
Hopkins & Co., F. H. 64
Marsh & Henthorn 51
Mussens Limited 32
Scott Machine Co. 57

Hydrants

Canada Iron Corporation 59
Gartshore-Thompson Pipe Co. 58
Kerr Engine Co. 8

Lime

Christie, Henderson & Co. 17
Jamieson Lime Co. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

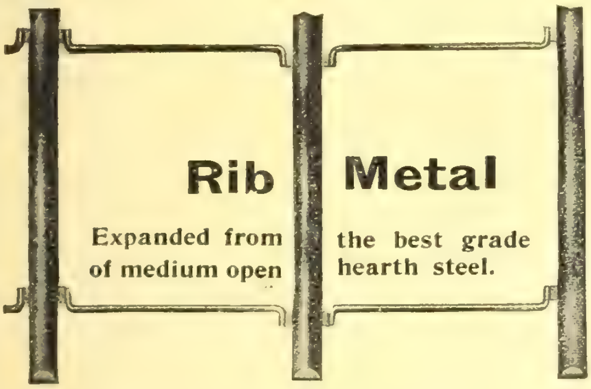
ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



Rib Metal

Expanded from the best grade of medium open hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

From Niagara to the Sea

"October the most beautiful month of the year on the St. Lawrence"

Through the famous 1000 Islands and "Shooting the Rapids" of the St. Lawrence to Montreal, Quebec and the marvelous Saguenay

Via the

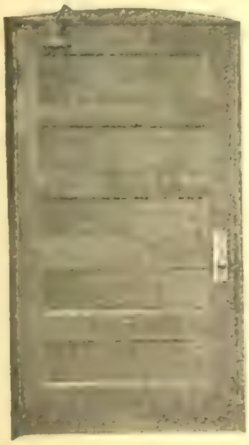
RICHELIEU & ONTARIO NAV. CO.

For full Particulars, Rates, Folders, etc. apply

THOMAS HENRY,
Traffic Manager, Montreal

JOS. F. DOLAN,
City Passenger Agent

They look like wood but they are fireproof



Our KALAMEINED CLAD DOORS are made in any design, finished in any color, **no bulging,** no nail heads and yet they are Fireproof and mean a reduction in Insurance Rates. The largest and best office buildings and apartment houses in the country have installed them, and have found them a valuable investment.

Let us give you approximate figure on these goods.

A. B. ORMSBY, Limited

Factories:

Cor. Queen & George Sts.
TORONTO

677-81 Notre Dame Ave. W.
WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	16
[illegible] Lumber Co	
Delaplante, Ltd.	20
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	63
Rhodes Curry & Co	
Sanitary Floor Co.	62
Siemon Bros.	57
Tillson Co	59
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	20
Metallic Roofing Co.	51
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co	52

Paving and Paving Materials

Dominion Carbolineum Works	12
Metropolitan Paving Brick Co.	54
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	53
Britnell & Co	53

Pipe

Canadian Pipe Co	58
Dominion Wood Pipe Co	9
Gartshore-Thomson Pipe Co	58
Municipal Construction Co	16
National Iron Works	59
Pacific Coast Pipe Co	1

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co	
Paterson Mfg. Co	

Pile Driving

	Page
Lincoln Construction Co	16

Pumps and Pumping Machinery

Beatty & Sons, M	52
Goulds Pump Co	
Hopkins & Co., F. H.	64
Inglis Co., John	22
Leonard & Sons, E	59
Martin Steam Pump Co	63
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	57
Smart-Turner Machine Co	1
Waterous Engine Works Co	

Roofing Materials

Barrett Mfg. Co	
Galt Art Metal Co	20
Metallic Roofing Co	51
Metal Shingle & Siding Co	20
Noble, Clarence W	20
Rogers Supply Co	31
Roofers Supply Co	59

Railway Supplies

Factory Products Limited	
Gartshore, John J	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co	10
Case Threshing Machine Co	58
Climax Road Machine Co	58
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co	56
Britnell & Co	53
Canada Iron Corporation	59
Dominion Sewer Pipe Co	56
Gartshore-Thomson Pipe Co	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co	14
Rogers Supply Co	31
Standard Drain Pipe Co	56

Sand

Rogers Supply Co	31
Sand & Supplies	55

Stone

	Page
Britnell & Co	53
Christie, Henderson & Co	17
Consolidated Stone Co	20
Contractors' Supply Co	53
Corinthian Stone Co	52
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co	5
Laurentian Granite Co	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co	31
Roman Stone Co	17
Sackville Freestone Co	11
Sand and Supplies	55

Structural Iron and Steel

Buffalo Steel Co	
Dominion Bridge Co	18
Eastern Canada Steel Co	15
Hamilton Iron & Steel Co	
MacKinnon Holmes & Co	19
Pennsylvania Steel Co	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co	60
Reid & Brown	60
Salter, W. H	19

Shovels (Steam)

Beatty & Sons, M	52
Hopkins & Co., F. H	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, In	55

Slate

Roofers Supply Co	59

Steel Shingles and Ceilings

Galt Art Metal Co	20

Smoke Stacks

Leonard & Sons, E	59

Safes and Vaults

	page
Taylor, J & J	

Stone Cutters

Bailey-Underwood Co	62

Sheathing Papers

Cabot, Samuel, Inc	55

Telephone Supplies

Northern Electric & Mfg Co	

Tiles

Smith Marble & Construction Co	53

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co	2
Leonard & Sons, E	59
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co	19

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co	58
Kerr Engine Co	8
Standard Fitting & Valve Co	57

Ventilating System

Gardiner & Gaskill	54

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co	64
Greening Wire Co., B	62
Smith, Thos. & Wm	

Wire Guards and Screens

Canada Wire Goods Mfg. Co	52

Water Wheels

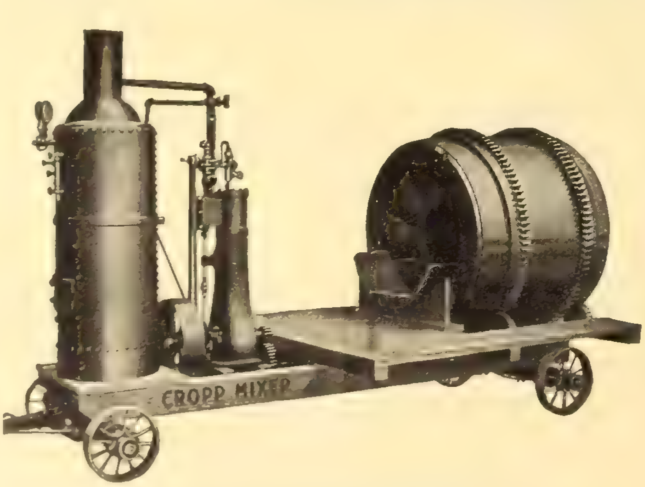
Canadian Boving Co	2

Wire and Cable

Factory Products Limited	

The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

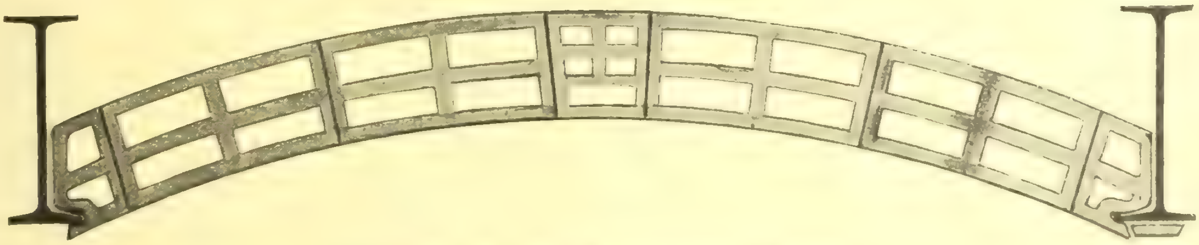
Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

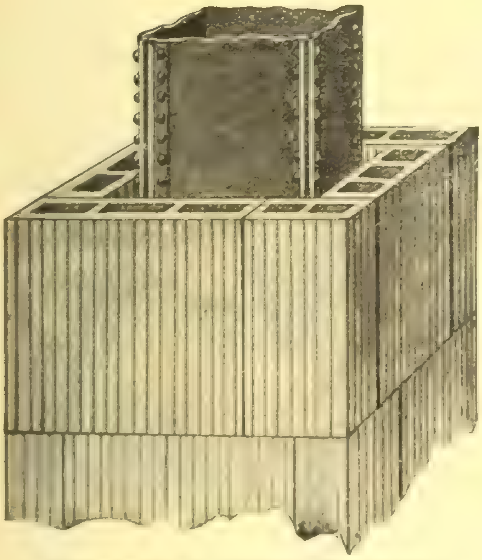
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

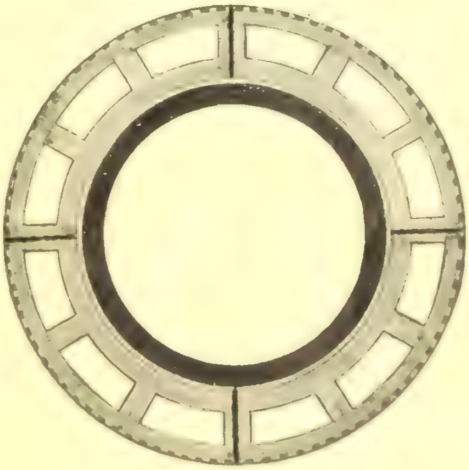


Section showing style of Skewbacks and Keys

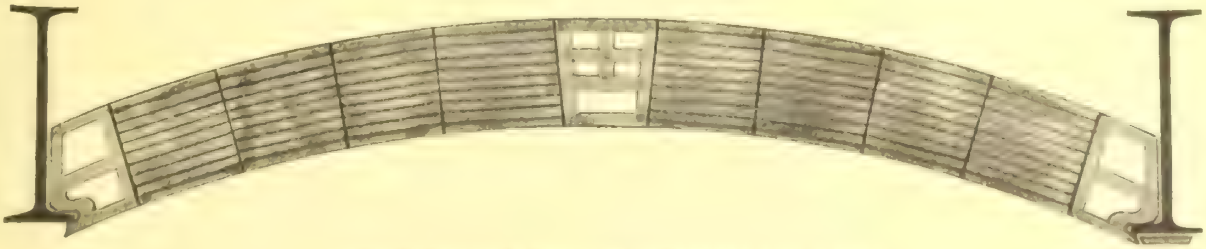


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



Section showing style of Skewbacks and Keys

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Satisfaction With

KERR VALVES

IRON

BODY

GATE

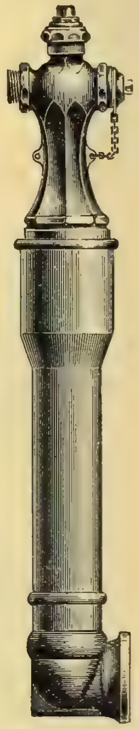
VALVES

We have been making "Kerr" valves and hydrants for a long time and know what a good valve is.

The many cities and towns throughout the Dominion that have used our goods say they are very satisfactory.

If your town or city intend making extensions or installing a new system of waterworks it will pay you to specify "Kerr" goods.

Their value has been proved by long and satisfactory service.



Compression Hydrant

"Weber" Gate (Brass)

Hub End Gate

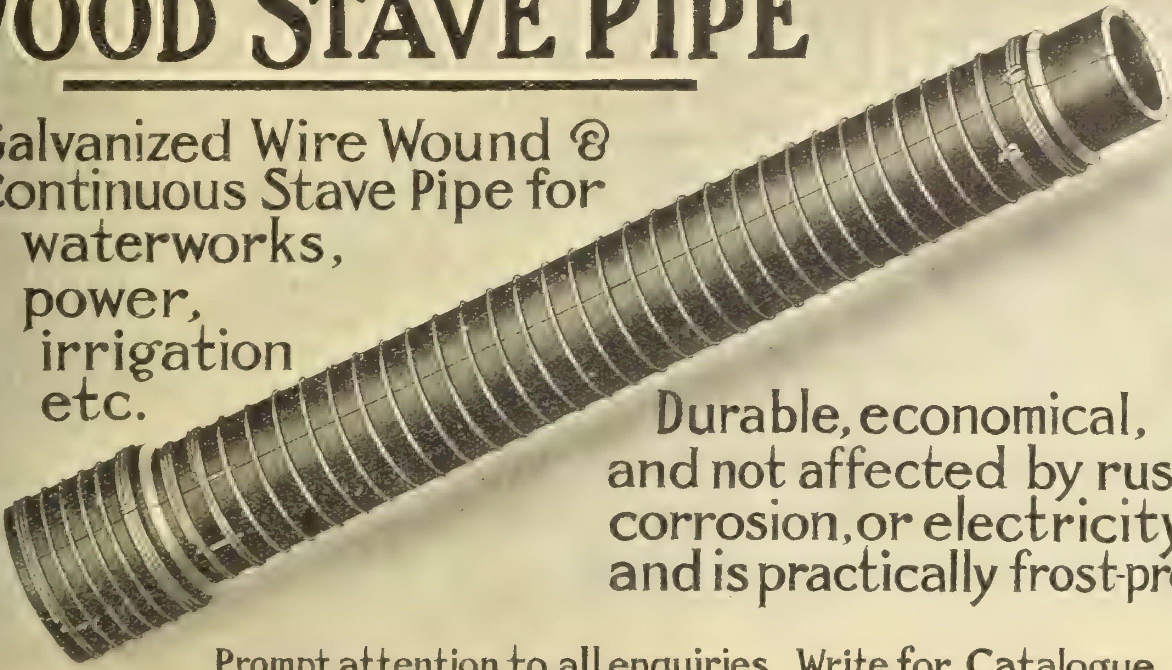
THE KERR ENGINE CO. LIMITED

VALVE AND HYDRANT MANUFACTURERS

WALKERVILLE, ONT.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

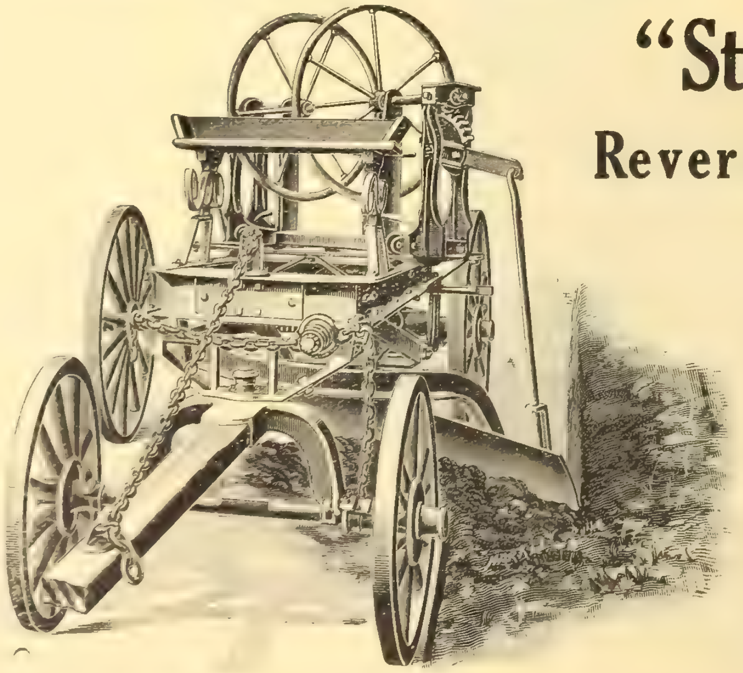
Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

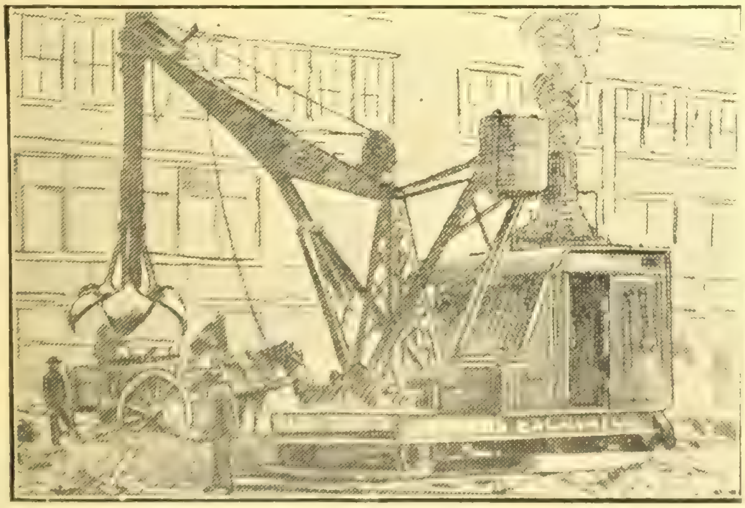
Block Stone
Head Sills
Dimensions
Shoddy
Random
Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

The Advantage of the

J. W. Harris Excavator



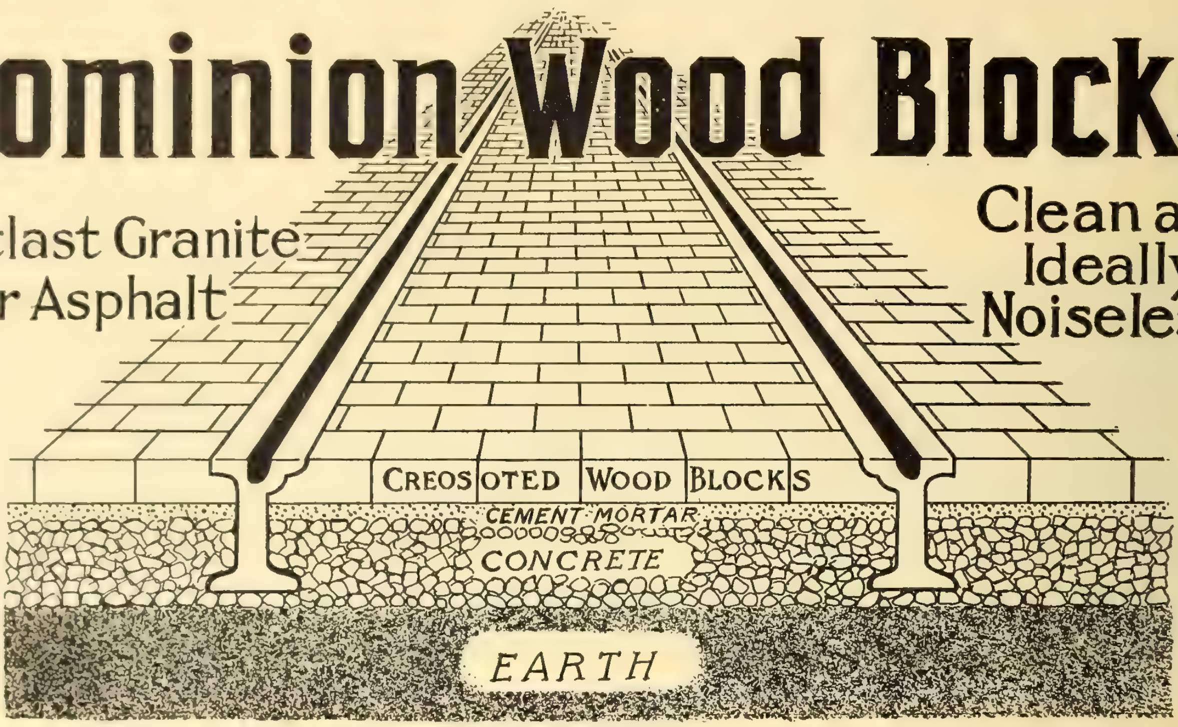
is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.
No Contractor should be without it.

For further information apply:

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks



Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless

D ominion Wood Blocks make an ideal pavement.

O wing to the elasticity of the wood they will not pulverize.

M ake relaying after excavating for water connections etc. easy and inexpensive.

I mpervious to water.

N oisless as tan bark.

I mpregnated with creosote which prevents decay.

O utlast asphalt or brick pavement.

N ative live Douglas Fir logs used for their manufacture.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

Marble Exteriors

These have not become nearly so general in the Canadian cities, up to the present, as they are in Europe and the United States, partly because of the great cost of imported marble, partly because of the difficulty and delay in delivery.

These difficulties are, however, now entirely removed. Our beautiful light grey marble is being sold at a price which makes marble a material of general availability.

Our new plant, giving us a total equipment of 18 gang saws, besides circular saws, rubbing beds, planers, lathes, carborundum machine, pneumatic tools, electric cranes, etc., puts us in a position to finish 2,000 cubic feet of material every week.

The test of the material made at McGill University, showed a resistance of 22,000 lbs. to the cubic inch, a strength equal to the best grades of granite The absorption test was very low.

We have put in several moderate sized exterior jobs, which have given the architects and owners entire satisfaction.

Our method is to furnish the material, all finished, ready for setting, f.o.b. car at any desired destination.

We are always pleased to make up prices.

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**
85 Sparks Street, Ottawa, Ont.

District Sales Agents :

Bosse & Banks, Quebec, Que.
Jas. Robertson & Co., St. John, N. B.
Walker & Barnes, Edmonton, Alta.
G. R. Duncan, Fort William, Ont.
Eadie-Douglas Co., Toronto, Ont.
General Contractors' Supply Co., Halifax, N.S.
Wm. N. O'Neil & Co., Vancouver, B.C.
C. N. Barclay, Winnipeg, Man.

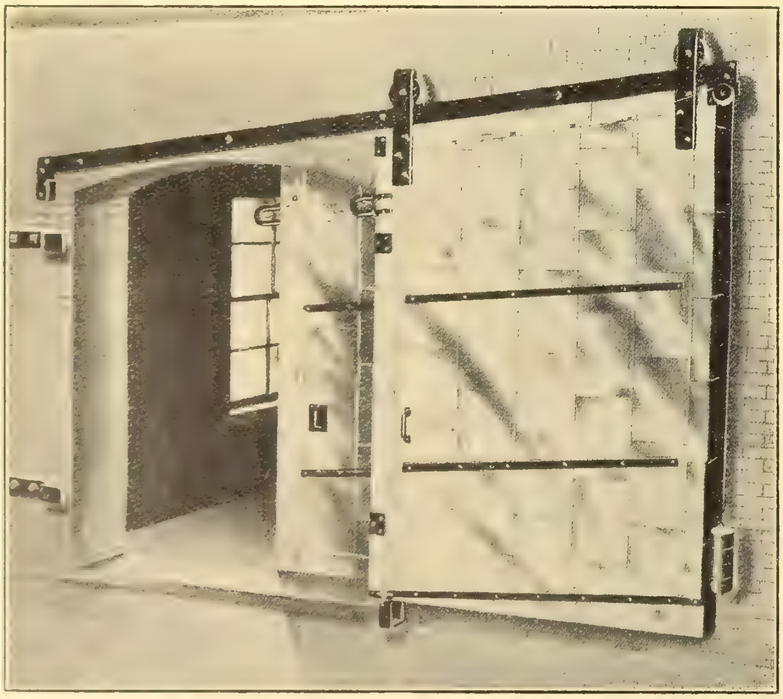
Vitrified Salt Glazed Sewer Pipe

Sizes 4" to 24" inclusive
Write for Catalogue

is what you want for your Sewer. This may be the cement age as far as work above ground goes, but for buried folly it will soon find you out. New cases of the **unsuitability of Cement Pipe** for sewers are coming to light every day, the latest being in **North Battleford, Sask.** where the **whole system of cement sewers is condemned** by the Government Expert before a single house connection is made. Why? Because the pipe were running more than **half full of water absorbed from surrounding soil,** and the joints were **crumbling away a few months after installation.**

Have you ever heard of a similar occurrence when **Vitrified Clay Pipe** was used?

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones: Park. 422 Evenings or Holidays, Park. 3888 and 3889 Toronto Connection



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P.Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

DENNIS-LONDON ORNAMENTAL IRON

The **Dennis Wire & Iron Works Co.** Limited

London, Canada

Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

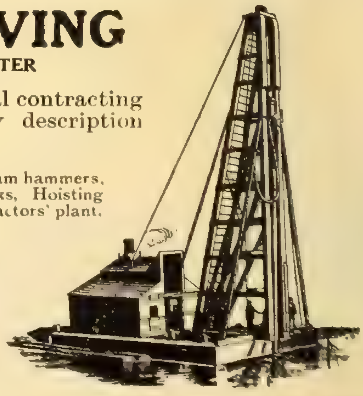
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced Concrete Construction

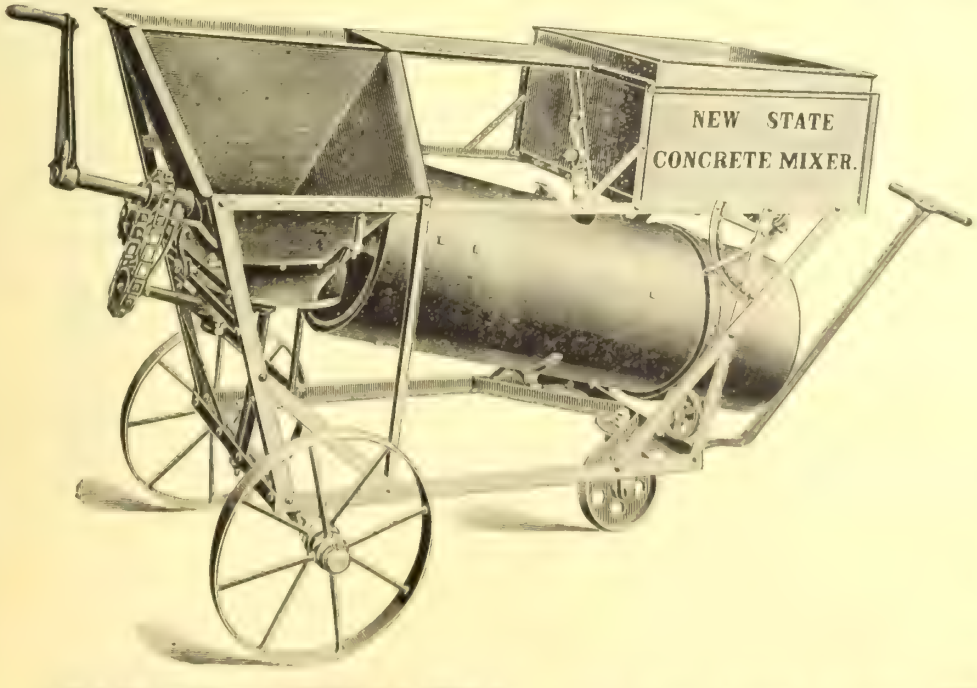
¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

THE NEW STATE CONCRETE MIXER

For mixing sand, gravel, crushed-stone and cement, the handiest machine upon the market



With frame of finest angle steel, hoppers and water tank of heavy galvanized iron, and drum of No. 14 boiler steel, it will stand the hardest reasonable usage. Is simple in construction, may be operated by hand or any kind of power, and mixes perfectly in any proportion from 1 to 2 to 1 to 12.

The low sand hopper effects a big reduction in shovelling labour. And mounted upon 18-inch wheels and a 9-inch truck it is "as handy as a wheelbarrow."

Let us send you quotations and full particulars

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—
New York N.Y. - 71 Broadway
Baltimore, Md. - - Continental Trust Bldg.
Boston, Mass. - - - 70 Kilby Street
Chicago, Ill. - - - Western Union Building
Mexico City, Mex. - Edificio de "La Mutua"
Philadelphia, Pa. - - Morris Building
San Francisco, Cal. - - 1505 Chronicle Building
St. Louis, Mo. - - Commonwealth Trust Building
London, England - - 110 Cannon Street
Steelton, Penna. - - At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial

MANUFACTURED BY

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company Montreal

"Lead and Steel Die Process"

"GALT"

Embossed Steel Ceilings

Artistically and practically a little ahead of anything else in this line being made in Canada.

The clean, sharp embossing that distinguishes "Galt" Ceilings and Walls is produced between **Lead** and **Steel Die**, therefore—always uniform in depth, bold and clear-cut in appearance and free from cracks.

Machine-Cut Beads—another patented improvement. They make erection easier, 25% cheaper and a perfect job surer.

In art-work and mechanical production "Galt" Ceilings represent the latest developments in metal ceilings. Why be satisfied with old-fashioned stuff when the modern is here and costs less? Get our estimates on your work.

The Galt Art Metal Co., Limited
Galt, Ont.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

This space is ordinarily used to explain the advantages of

Herringbone Metal Lath

It is useless now. We have been running day and night for several weeks past and the orders are still gaining on us. When our new machinery is installed we will again explain why **Herringbone,** which is not the cheapest metal lath on the market, is such a favorite among close figuring contractors. At present we are merely holding this space.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

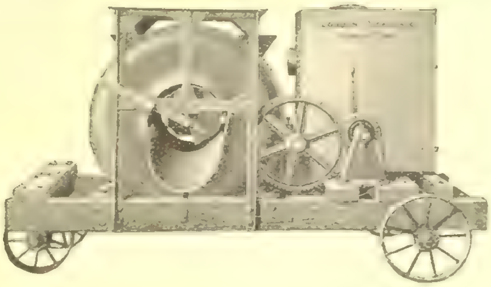
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Standard Drum Batch Concrete Mixer



The very latest ideas and improved plans of construction are embodied in this machine. CONTRACTORS it will be well worth your while to write for full particulars.

We Can Save You Money {
On the first cost of machine
Cost of maintenance
Cost of producing Concrete

This machine is manufactured in several sizes and with every equipment desired. Let us tell you all about it. State capacity required when writing. We also manufacture the now famous LONDON AUTOMATIC BATCH MIXERS No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full Line of Concrete Machinery.

The London Concrete Machinery Company

19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada

---

Hardwood Flooring

"Empire" Quality

Just Rockhard Facts

When you want Maple or Beech Flooring of "Empire" Quality, flooring which has been made from good lumber and has been kiln dried and manufactured properly, and grades which have not been "blended" to meet price competition—send us your orders.

Competitive stock bought at a lower price is not a good advertisement to you if it results in a dissatisfied customer who will soon forget the difference in price but he will not forget the poor flooring.

Regardless of price our high standard of quality will not be changed, nor shall we try to fool you by mixing grades.

"Empire" Quality results from good lumber, superior millwork, years of experience, and the most careful and systematic attention to detail exactness.

[illegible]

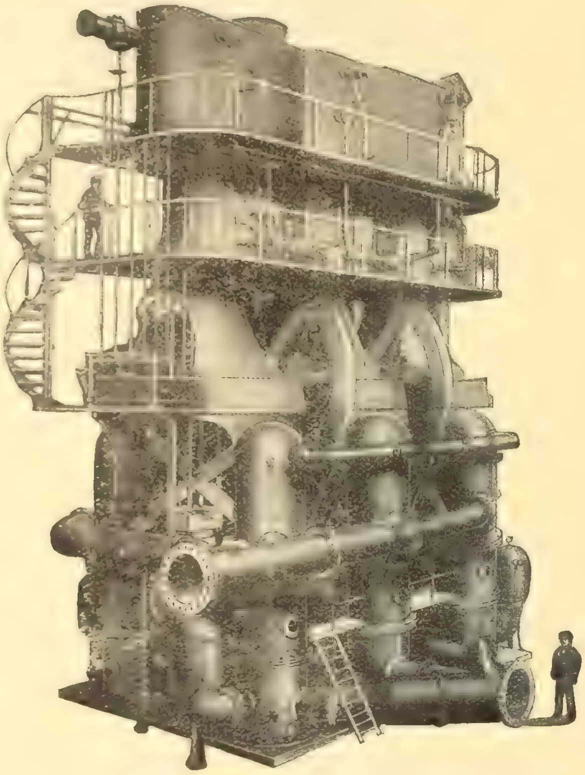
J. R. Eaton & Sons

Limited

Orillia, Ontario

[illegible]

Waterworks Pumping Plants



CAPACITIES

from one to

15 Million Gallons

Per 24 Hours

Expert unbiased advice gladly given. Let us help you solve your waterworks difficulties ::

The ***high economy*** attained with **"INGLIS"** Waterworks Pumping Engines is the result of correct design ; careful selection of materials and the highest grade of skilled labor.

We shall be glad to furnish full details of these engines, upon request

The John Inglis Company

ENGINEERS AND BOILERMAKERS **Limited**

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.

The city council plans an early start on the paving of all the streets in the business sections of the city.

Barrie, Ont.

The tenders for the sewers were as follows: John Coun of Windsor: Clapperton street, $3,115.50; Small street, $2,479.; William street, $969.68; Ross and Bradford streets, $3,979. This was exclusive of cost of manholes, catch basins, etc. D. J. Tuck's tender was: Clapperton street, $2,475; Small street, $1,775; William street, $775; Ross and Bradford street, $3,450. Wm. Simpson, of Collingwood, submitted a tender for the Small street contract only. His figures were $2,454.26.

Hamilton, Ont.

City Engineer Macallum has announced that he is looking for a site for a new reservoir capable of holding 25,000,000 gallons of water. He is looking for a site containing approximately 10 acres half way up the face of the mountain. Cost, $100,000.

London, Ont.

Dundas street hill will be paved with cedar blocks.

Meaford, Ont.

Mr. Cook will advertise for tenders for grading of Nelson street hill.

Montreal, Que.

A proposition has been made to the Board of Control by James H. Maher, the well-known local contractor, who offers the city the land for a boulevard extending four miles from the St. Catherine road to the Back river near Bordeau. The boulevard is to be 125 feet wide, with double-track space and double driveway, and is to be given to the city free of charge, provided they undertake to make the boulevard.

The tenders for steel pipe dredging work and concrete pier in connection with new intake for waterworks were received from the following firms: (a) Lemome & Son and L. Desy, (b) M. Connolly, (c) Laurin & Leitch, (d) Canadian General Development Company, (e) Quinlan & Robertson, (f) Harris Construction Company, respectively, at the following prices: (a) $52,000; (b) $49,200; (c) $52,810, $55,270; (d) $50,500; (e) $59,000, (f) $47,623; for laying pipe: (a) $81,500; (b) $90,000; (c) $85,500; (d) $92,400; (e) $104,000; (f) $120,000; concrete work: (a) $18,000; (b) $32,000; (c) $26,145; (d) $38,100; (e) $16,000; (f) $25,000; for crib work: (a) $4,000; (b) $13,000; (c) $2,544; (d) $4,000; (e) $7,500; (f) $5,000. The totals were respectively $155,500, $181,000, $167,000, $169,463; $185,000, $186,500, and $197,623. Munderloh & Company tendered for supply of pipe only, $45,175; John Inglis Company also, at $61,000.

North Vancouver, B.C.

Through efforts of Ald. Wm. McNeish of North Vancouver, the provincial government has promised to waive its claim to reversionary rights to three acres of land in the Indian reserve, which, according to an agreement entered into between the city council and the Indians three years ago, the former was to obtain for $3,000, and in return promised to install a water system. Difficulties occurring with the federal government regarding reversionary rights have thwarted the efforts of the council in the past. The water will be installed as soon as the necessary papers have been properly signed by all parties concerned.

Sewer appropriation By-law for $40,000 was carried.

Prince Albert, Sask.

The by-laws to install a filtration plant, $12,000; to construct a trunk sewer, $110,000; to construct extensions to sewer and waterworks, $2,600, were all carried.

Swan River, Man.

The town council has decided to lay cement sidewalks along the principal streets.

Toronto, Ont.

The Board of Control has adopted the Park Commissioner's plan for the beautification of University avenue at a cost of $30,000.

Verdun, Que.

The town of Verdun has passed a by-law for the issue of debentures to raise the sum of $250,000 for the extension of the river dyke for completion of the electric system, the macadamizing of streets, drainage of the dyke, and a sinking fund.

Victoria, B.C.

Tenders for paving Vancouver street between Pandora avenue and Humboldt street (14,000 square yards) will be called at once. Estimated expenditure, $100,000.

Vancouver, B.C.

The city engineer will shortly present estimates for bitulithic paving on Seventh avenue from Scotia street to Bridge street.

The by-law to authorize the loan of $500,000 to cover sewerage repairs and extensions in the city will be submitted to the ratepayers on November 5th.

Tenders addressed to Wm. McQueen, city clerk, will be received until October 18th for re-surfacing Abbott street and, etc., with asphalt or bitulithic pavement. Plans, etc., at office of city engineer.

Tenders addressed to Wm. McQueen, city clerk, will be received until Oct. 18th for construction of wood block pavement in the lane north of Hastings street, etc. Plans, etc., at office of city engineer.

Proposed by-laws for $110,000 for grading, macadamizing and constructing concrete culverts and wooden cribs on Clark drive from Powell street to the south city limits, and for $45,000 for grading and macadamizing Broadway from Glen drive to the east city limits, are being discussed by the Council. City Engineer Clement.

Wetaskiwin, Alta.

The C. P. R. announce their intention to construct another dam at Pipestone next in the spring. It is supposed to make by this dam a reservoir for 1,000,000 gallons of water.

Winnipeg, Man.

At a meeting of the Kildonan Council held recently a deputation of ratepayers appeared to protest against the proposed construction of a sewer by the city of Winnipeg in Kildonan, two blocks north of the present city limits.

AWARDED.

Barrie, Ont.

The contract for sewer here was awarded to D. J. Tuck, Barrie, at $8,475. E. Donnell, town clerk; K. S. Macdonnell, engineer in charge.

Edmonton, Alta.

E. Wondus secured the contract to lay three bloks of the Namavo avenue sewer at $14,435.

Montreal, Que.

The Montreal Water & Power Company, which is now supplying about 157,000 people in this city and its suburbs, has placed a contract with the New York Continental Jewel Filtration Company, New York, N. Y., for a water purification plant of 30,000,000 United States gallons capacity. The contract calls for low-lift pumps drawing the supply from the St. Lawrence at the present pumping station, and sedimentation basins and filters. The amount of the contract is understood to be about $375,000,000.

Nanaimo, B.C.

Moore & Pethick, of Victoria, were awarded the contract for the construction of a cement dam at No. 1 reservoir, at over $13,000.

New Liskeard, Ont.

The contract for laying sewer pipe here has been given to H. Proctor at $2,083. C. H. Fullerton, engineer.

Stellarton, N.S.

Donald Sutherland, of this town, has secured the contract of laying over four miles of sewerage.

St. John, N.B.

At a special meeting of the council recently the contract for the Germain street permanent paving was finally given to the Hassam Company. The width of the carriage way between Princess and Queen will be reduced to 25 feet, and the boulevard sidewalk as asked for by the residents, built. The cost of the work will be $10,765, which is $38 above the figures submitted, the explanation being that an omission had been made.

Railroads, Bridges and Wharves

Brockville, Ont.

The Ottawa, Rideau Valley & Brockville Railway Company, which secured incorporation last session to build a line from here to Ottawa through the south part of Kitley and Leeds counties, will begin construction in the near future. Wm. Wainwright, director, G. T. R.

Calgary, Alta.

Tenders are called until October 15th for [illegible] [illegible] to bridge. B. E. Mit[illegible] [illegible] engineer, McDougall block.

Tenders are being called by the city commissioners until November 7th for erection of steel bridges across the Elbow river. W. D. Spence, city clerk.

Hull, Que.

Engineer [illegible] A. Vallee, of the Public Works Department, Quebec, sent a letter to the Hull city council condemning the Gatineau river bridge. He also stated that he would allow thirty days in which to make repairs, and if they were not made then he would be compelled to close the bridge. No action was taken.

Montmagny, Que.

Tenders addressed to secretary-treasurer, A. Renaud, will be received until December 1st for construction of iron bridge over the Riviere du Sud.

Ottawa, Ont.

The Provincial Government has decided to aid in the building of a new iron bridge over the Chaudiere river. The cost of the structure will be about $33,000, and the Government will give a grant of $15,000 towards the construction.

Plans prepared for the proposed high level bridge over the canal at Bank street call for concrete and 60 feet in width. The main span for the boats to pass through would be 76 feet wide, with a height of 32 feet from the water to the bridge.

Ste. Croix, Que.

Tenders are being called until November 2nd by Public Works Department, Ottawa, for construction of landing pier here. R. C. Desrochers, secretary.

St. John, N.B.

The council has decided to transfer to the C. P. R. a large area of shore lots on the west side of Courtenay Bay, where a seawall is to be built by the Public Works Department, and where the C. P. R. will establish extensive terminals. Mr. C. M. Hays of the G.T.R., has arranged to go to St. John shortly in regard to the negotiations for the establishment of the G. T. P. terminals on the east side of Courtenay Bay. He will meet Hon. Mr. Pugsley, Minister of Public Works, and it is expected that as a result of their visit big plans for the development of the port by the G.T.P. will be announced.

Vancouver, B.C.

The government has approved of the Thompson Company's plans for a drydock at Vancouver, and the company is now assured a subsidy of three and a half per cent. for twenty-five years on the cost of construction. The plans provide for a commercial dock of the second class, under the subsidy act. It will be over six hundred feet long, and will cost over a million dollars.

Winnipeg, Man.

Tenders are called for erection of fourteen steel tanks at stations between Brandon and this city during November and December. Fur further information write Box 868, Free Press.

Tenders are being called until Nov. 2nd for construction of protection pier at Winnipeg Beach by Public Works Department, Ottawa. R. C. Desrochers, secretary.

Windsor, Ont.

Plans of Essex Terminal Railway for switching the line from Windsor's factory district to the terminals of the five trunk railways entering the city have been approved by the Board of Railway Commissioners. The order passed by the board gives the company permission to build a line through parts of Windsor and Walkerville, subject to terms and conditions laid down in its application provided the work is completed within three months. This will materially assist Windsor's industrial scheme, which began last spring with the purchase by the city of property for factory sites. All that now remains is to arrange for a crossing over the W. L. & L. S. Railway line, and steps have been already taken by the officials of the Essex Terminal to secure a ruling from the railway commision as to the protection required. W. Woollatt, general manager, Essex Terminal.

AWARDED.

St. John's, Que.

The contract for construction of concrete piers and abutments for bridge between St. John's and Iberville has been awarded to F. Lemoine & Son, Montreal, at $28,700, or $13 per cubic yard; $2,700 for piling. Harris Construction Company, Montreal, tendered at $16.90, and Quinlan & Robertson at $15, and $3,000 for piling. Engineer in charge, Beaulue & Mercier, St. Hubert street, Montreal. J. A. Raymond, secretary-treasurer.

Virden, Man.

The Wm. Newman Company, Limited, of Winnipeg, received the 60-foot reinforced concrete bridge contract at $2,800. Geo. Haines, Virden, tendered at $4,530.

Public Buildings, Churches, Schools, etc.

Chatham, Ont.

A new club composed of John Richmond, William Lecoq, and others has been formed and their intention is to build a large clubhouse near Big Point.

Chatham, N.B.

The Dominion public building here will be extended.

Calgary, Alta.

The Calgary School Board voted to expend $500,000 on three new schools, an addition to the high school and three sites for new schools.

The isolation hospital site on Twelfth avenue will be offered to the government upon which to build an armory. The government agreed to pay the cost of the erection of a suitable armory, provided the city furnishes the site.

Estevan, Sask.

The by-law to authorize the issue of $5,000 debentures for the purpose of erecting a rink here will be submitted to the ratepayers on the 20th of October.

Fort William, Ont.

Tenders were received until October 12th for erection of new police station and court house here. R. E. Mason, architect.

Grand Forks, B.C.

Tenders are being called by the Public Works Department, Victoria, until October 25th, for erection of brick and stone building here.

Gunton, Man.

Tenders were received until October 8th for all trades required in erection of four-room school here. Plans, etc., at office of architect, P. H. Eade, Western Iron Works, Limited, Builders' Exchange, Winnipeg.

Lethbridge, Alta.

Tenders for $75,000 public school debentures at 5 per cent. (20 years) are called until Nov. 1st. C. B. Bowman, Lethbridge, secretary-treasurer.

London, Ont.

The new Masonic Temple to be erected on Queen's avenue will not be built until some time next summer. Next spring the plans will be considered. It is said, and it is expected that the construction work will be commenced about July 1st.

Montreal, Que.

The sum of $500,000 has been pledged by local business men here and additional capital promised from outside towards the proposed Canadian-Franco-British-American Exposition next year.

Melville, Sask.

The citizens will vote on a by-law to provide $6,000 for a cottage hospital.

Nelson, B.C.

Tenders addressed to the Secretary of the Militia Council, Ottawa, will be received until October 15th for construction of rifle range here. Eug. Fiset, colonel.

Niagara Falls, Ont.

Plans have been prepared for an addition to the Pierce Avenue Presbyterian Church, to cost $10,000.

The one tender received for erection of new fire hall was so much in excess of a propriation made, that the matter was referred back to the Fire, Water and Light Committee to revise plans.

Owen Sound, Ont.

Until October 15th tenders will be received for $5,000 4½ per cent. 5 year hospital debentures.

Ottawa, Ont.

The First Congregational Church have purchased a building site on the corner of Florence and Kent. Rev. G. Watt Smith, pastor.

Prince Rupert, B.C.

Buildings to the extent of about $13,000 will be erected here for the Salvation Army. Ensign and Mrs. Johnstone are in charge of the Army's work here.

Regina, Sask.

The successful architects in the competitin for the provision of library plans are Messrs. Storey & Van Egmond. The plan provides for erection of fireproof building at a cost of $40,000.

Smiths Falls, Ont.

The time for receiving tenders for erection of collegiate institute here has been extended until October 13th owing to small number of tenders. W. Newlands & Sons, Kingston, architects. C. H. Wickware, chairman Board of Education.

St. Catharines, Ont.

The trustees of school section No. 1, Clinton, have decided to raise $5,000 in one year for the erection of a new school. An order has been issued to the council to raise the required amount.

Sandwich, Ont.

The Border Chapter Daughters of the Empire have endorsed the purchase of the Iler homestead near here to be used for a free tuberculosis hospital.

St. John, N.B.

Tenders were received until October 10 for all trades required in the extension of Trinity church rectory. Plans at office of G. E. Fairweather, architect.

Sherbrooke, Que.

Rev. Father Girard is in charge of the work of building for the Redemptorist Fathers here. He is a practical builder and architect and will act as supervisor and let contracts, etc.

Stratford, Ont.

A committee composed of Ald. Carter, Sheriff Magwood, Rev. S. M. Hauch, and others has been appointed to look into the possibility of a Children's Shelter on the site recently offered by Mr. W. R. Marshall.

Selkirk, Man.

Tenders for furnishing and installing the heating, ventilating and plumbing systems for the Asylum for Insane here were called until October 7th by Public Works Department, Winnipeg. R. Rogers, Minister of Public Works.

Toronto, Ont.

The controllers decided to expropriate the site for the new fire hall at St. Clair avenue and Hendrick street.

The Board of Governors of McMaster University have decided to sell the present property on which the present buildings are and purchase a site on the outskirts of the city. Chancellor, Mr. McKay.

Uxbridge, Ont.

Tenders were called until October 12th for heating public school, either with steam or hot air. Plans at office of H. Bascom, secretary, or at the office of the architect, Jas. Walker, Toronto street, Toronto.

Victoria, B.C.

The Odd Fellows have purchased 160 feet frontage on View street for the erection in the near future of a first class hall.

Mayor Morly has advanced a scheme to build a new city hall to cost half a million dollars.

Building permit was issued to the Alexandra Club for club building on Courtney street, $51,200. D. C. Frame, architect; Westholme Lumber Company, contractors.

Vancouver, B.C.

It is probable that a Bible house will be built in this city, to be the local headquarters of the Canadian Bible Society. No definite plans have as yet been made. Rev. J. Knox Wright is the provincial secretary.

Plans for the proposed isolation hospital on the Admiralty Reserve as presented by Mr. Dalton, of Dalton & Everleigh, call for a building two storeys in height, which will cost about $10,000.

The proposed St. James Anglican Church will be 125 feet in length, 80 feet wide and 70 feet to the peak of the roof and will cost before completed, about $120,000. The portion to be constructed first will cost $75,000. J. T. Alexander is the architect; Rev. H. G. Fynes-Clinton, the rector of the present church.

The Vancouver Y. M. C. A. has bought a site in the west end on which they will erect a handsome building. It is stated that plans will be called for shortly.

Warren, Man.

The by-law submitted to the land owners of the consolidated district of Meadow Lea, [illegible] and Hanlan, for $7,500 for the erection of a four-roomed school was defeated.

Welland, Ont.

Plans for the new Welland Club house are being prepared. The $10,000 has been sufficiently subscribed to guarantee the erection.

Winnipeg, Man.

The architect for the new theatre on Notre Dame avenue to be built for Mr. J. M. Nash is Mr. A. W. Melville. The building will have a frontage of 40 feet, and will hold about 500 people.

The Manitoba Government has announced the purchase of 600 acres at St. Vital, six miles south of the city for the Agricultural Colleges.

AWARDED

Fort William, Ont.

The Fire, Water and Light Committee of the City Council awarded the contract to M. H. Braden at $17,000 for fire station, about $1,000 under the next lowest.

Halifax, N.S.

The contract for alterations to Naval Hospital for use of Naval College has been awarded to Faulkner & Macdonald, this city.

Montreal, Que.

Tenders were awarded for the construction of the two branches of the Y. M. C. A. one at the corner of Park avenue and St. Viateur street, and the other at the corner of Sherbrooke street and Arlington avenue, Westmount. Messrs. Robertson Bros. got the contract for the brick work, the D. M. Long Company, the carpentering; structural steel, the Calkins Tile and Marble Company, the marble and tile work, and R. D. Clark & Sons the plastering. These buildings are each to be three storeys high, with basement, and will cost between $60,000 and $70,000 each.

New Westminster, B.C.

The contract for the repairs and alterations required at the court house here was awarded by the provincial public works department to Contractor J. A. Allen at $13,500.

Whitby, Ont.

Contractor Trick has the contract for the enlargement of the court house.

Winnipeg, Man.

The contract for the fire alarm and signal station to be erected on Rupert street has been recommended to D. D. Wood for $62,711, which is slightly below the amount of the estimate. The board will also recommend that he commence the work as soon as possible.

Residences

Calgary, Alta.

Tenders were called until October 8th for excavation and concrete work required in erection of solid brick residence for Lieut.-Col. James Walker at East Calgary. Lang & Dowler, architects.

Tenders addressed to Lawson & Fordyce, architects, Norman Block, were received until October 8th for erection of brick veneer residence.

London, Ont.

A. W. McCorkindale, has a permit for two storey brick on Grosvenor street, $3,500.

Montreal, Que.

Tenders are being called for the remodelling of a cottage in Outremont for Mr. H. Mallette. Architect, A. Piche, Victoria Building.

Providence Bay, Ont.

Tenders are being called until Nov. 5th for construction of extension to wharf here on Manitoulin Island, Algoma, Ont., by Public Works Department, Ottawa. Secretary, R. C. Desrochers.

Toronto, Ont.

Mr. John Walsh will erect an apartment house on the large lot at the corner of Queen street west and Wilson avenue. The building will cost about $30,000.

Vancouver, B.C.

The following permits have been issued: A. Currie, dwelling, 1561 Twelfth avenue east, $4,500; Thos. Pledges, dwelling, 1225 Twelfth avenue east, $4,000; Valley & Derosier, dwelling, 1065 Thirteenth avenue west, $5,000; Western Home Imp. Company, three dwellings, 1605-13-21 Salisbury, $6,000; F. W. Dodd, dwelling, 1424 Tenth avenue east, $2,700.

Winnipeg, Man.

Work on the residence for Mr. M. Krolik in Tuxeda Park will not start until the summer of 1911.

Mr. Hugh S. Patterson, a member of the Grain Exchange, has purchased in Tuxedo Park, 130 feet frontage on Cranville Boulevard by 150 feet on Piper Boulevard. This property is to be used as a home site.

AWARDED.

Halifax, N.S.

Contract for erection of A. L. Malvin's residence on Turner road has been awarded to Chas. Carmichael. Dumaresq & Cobb, architects.

Montreal, Que.

Mr. J. Rawson Gardiner, architect, Quebec Bank Building, has awarded the contract for alterations to property on McGill College avenue for A. P. Stewart, Esq., to Messrs. Sparrow & McNeil, general contractors, Coristine Building.

Contract for the alterations and extensions to property at Chambord and Rachel streets, for Mr. G. M. Ducharme, has been awarded to H. Martin, contractor, 438 St. Antoine street. Architect, A. Piche, Victoria Building.

Mr. C. Dufort, architect, La Patrie Building, has awarded the following contracts for the erection of a cottage on Western avenue, Westmount, for Mr. Vanier, as follows: Masonry and concrete, Labelle & Lesard; brick, Jos. Faille; carpentry, Jos. Marcotte; painting and glazing, W. Rufiange; plastering, A. Cusson; plumbing, heating and roofing, Dominion Camp Equipment Company.

North Vancouver, B.C.

Messrs. Tuck & Brewer have obtained the contract for the erection of an $8,000 residence for Mr. Tappley, Vancouver, on Queensbury Heights.

Winnipeg, Man.

James O'Donohue, proprietor of the Grand Union hotel, has awarded the contract to Patterson, Inglebaek & Carter for the building of a residence on Arlington street, $15,000. H. Matthews is the architect.

Business Buildings and Industrial Plants

Brantford, Ont.

Tenders are being called until October 15th for construction of alterations and additions to [illegible] street, for Mr. A. [illegible] [illegible] architects, this city.

The [illegible] Company of [illegible] rio, will [illegible] a Canadian branch of the factory in this city, in connection with Hame & Nott Company. The foundation will be put in this fall ready for operation in the spring.

Duck Lake, Sask.

The mill and elevator of the Farmers' Milling Company were destroyed by fire on the 25th ulto. Estimated loss, about $35,000.

Calgary, Alta.

Thomas Underwood, of this city, has had plans prepared for the erection of a new four-storey block to be erected at the corner of First Street West and and Thirteenth avenue. The structure will be a thoroughly modern business block, 100 by 100. Work is to be commenced immediately, and the specifications call for the building to be completed by the end of the new year.

Campbellton, N.B.

The following establishments are being rebuilt: I. C. R. works, the Harquail woodworking establishment, the McLennan machine shops and the W. J. Duncan foundry. There are also good prospects for the building of six saw mills in the town and vicinity in the near future.

Dominion Station, Que.

A hardware manufacturing concern is enquiring for a site for a factory, and may take up certain options upon properties here.

Hamilton, Ont.

The Diamond Glass Company, James and Picton streets, has decided to build a plant here with a capacity double, and perhaps treble, its present capacity. Plans have been approved for a steel and brick building to cost $150,000. It will be completed early next year, in time to supply the orders of next season.

Londonderry, N.S.

Work on a 200-foot extension to the steel works here will be commenced at once. It is reported that Mr. C. L. Jobb will become general manager.

Merrickville.

The Percival Plough & Stove Company, of Merrickville, whose manufactury was destroyed by fire, will rebuild at once.

Medicine Hat, Alta.

It is stated that the Alberta Iron Rolling Mills Company will expend in the near future about $10,000 in construction and about $80,000 in machinery, etc.

Montreal, Que.

The property belonging to Mr. R. Wilson-Smith on Sherbrooke street, it is stated, has been purchased by the Ritz-Carlton Company, London, Eng. William Harris, chairman of hotel circuit.

Tenders are being called for certain alterations to property on St. Paul Street for the Salada Tea Company. Architects, Peden & McLaren, 20 St. Alexis Streets.

The large shed of the Elder-Dempster Line was destroyed by fire on the 6th inst. Estimated loss on building, $3,000.

It is understood that an additional four storeys will be added to the Jacobs Building in the spring.

The Bank of Toronto will erect a branch bank building at the corner of Lasalle avenue and Ontario street. Architects, Finley & Spence, 46 Beaver Hall Hill.

North Sydney, N.S.

The following suffered loss by fire on the 5th inst.: W. J. Christie, owner of building, McKenzie & Hicky, tailors· F. H. Rudderham, druggist, and Allen & Dewolf. Etsimated total damage, $30,000.

Nelson, B.C.

T. G. Proctor, agent, McGoldrick Lumber Company, advises us that nothing will be done in the meantime with regard to the construction of mill in Fairview.

Neepawa, Man.

The local business men have subscribed $40,000 towards the establishment of the match factory here. Work on the erection will be started at once. Noted in issue of of September 28th.

New Westminster, B.C.

The largest cement works in the world, it is stated, are to be erected on the Chilliwack River. Mr. C. D. McRae, engineer for the capitalists, has presented a highly favourable report and preliminary work is to be started immediately. It is proposed to run the immense plant by electricity generated from falls on the Tommihy and Silica creeks.

Ottawa, Ont.

Publicity Commissioner Baker is agitating for the extension of car line down through Bayswater, in which case, prospects for the location of two or three good industries would be favorable.

Permission was given Mr. Jas. E. Wilson by the city council to establish a mill and lumber yard on Riverdale avenue. It was decided to have a committee of aldermen appointed to consider industrial areas for sites for factory and lumber yards.

Petrolea, Ont.

Messrs. Kemp & Craise will erect a large garage and repair shop here.

Princeton, B.C.

C. R. Briggs, secretary-treasurer, British Columbia Portland Cement Company, Limited, is making preparations for the construction of the large plant contemplated. R. P. McLennan and J. A. Harvey, both of Vancouver and L. E. Shatford, of Hedley, and R. Cross, of Spokane, Wash, are interested.

Peterboro, Ont.

Fire destroyed E. H. Manns & Company's cheese box factory on the 8th inst. The damage is estimated at $2,000.

Prince Rupert, B.C.

The Canadian Fisheries & Cold Storage Company has secured a valuable site of 74 acres with 3,600 feet water frontage on the Skeena River near here as headquarters for its fishing industry. The company immediately will go ahead with the construction of docks. Capitalization, $1,000,000. Jas. Carruthers, of Montreal, and Sir Geo. Doughty are behind the scheme.

Quebec, Que.

The dry goods store of Joseph Gilbert, corner of St. Paul and St. Nicholas streets, was gutted by fire on the 4th inst. Loss, about $15,000.

Rainy River, Ont.

It is reported that the Rat Portage Lumber Company have lost all their plant with 60,000,000 feet by the recent fire. The Rainy River Company suffered the loss of 35,000,000 feet of lumber.

Regina, Sask.

The Myers Fence & Iron Company, it is stated, will locate a branch here. Mr. N. H. Elgar, president.

Strathcona, Alta.

Through the agency of Jas. Gallagher & Company, the Whitworth Confectionery Company, of Edmonton, has bought a site on the Barber estate for a new factory here.

St. Thomas, Ont.

Negotiations are still in progress for the location here of the knitting factory. In return for a loan of $30,000 for ten years, etc., a factory, 196 x 50, 3-storey, will be erected at a cost of $30,000. Committee in charge of the town's interest: Ald. Chant, J. P. Freek, Mayor Guest and W. H. King.

South Vancouver, B.C.

Thos. Houston and George Greensdale are having plans prepared for a fine three-storey structure on the southeast corner of Feris road and Fraser avenue. The building will have a frontage of 90 feet, and will extend back 100 feet. The details have not been worked out and plans are not completed.

Saskatoon, Sask.

W. J. Weedon has announced that he will erect a paint and oil distributing warehouse here, a branch of the New York house. F. M. Sclander, commissioner, Board of Trade.

Toronto, Ont.

Permit was issued to Geo. Glendenning for 3-storey brick garage and offices, 18 Bloor street east, $60,000; also to Canada Cycle & Motor Company, 4-storey brick factory on Weston road, $45,000.

Uxbridge, Ont.

The Arlington Hotel here was damaged to the extent of $3,000 on the 5th inst.

Vancouver, B.C.

Mr. W. Owen, representative of a British syndicate, has secured a site for the establishment of the steel plant and iron foundry and smelter.

The Bank of Ottawa has submitted plans and specifications to Building Inspector Jarrett for an eight storey building to be erected at the corner of Hastings and Seymour streets, at a cost of $250,000.

Welland, Ont.

The Canadian Billings Spencer Works will extend its plant.

Winnipeg, Man.

A new company to be known as the Winnipeg Tanning Company has taken over the Mullins' Tannery, which they will enlarge greatly. President, E. A. James, Winnipeg. H. J. G. Mayes, vice-president and general manager; Mr. Van Dorsser, secretary-treasurer. Capitalization, $300,000.

Mr. Herbert Burbidge, son of R. Burbidgek, managing director of Harrod's stores in London, and also director of the Hudson Bay Company, has been appointed general manager of the Hudson's Bay Company's stores in Canada. Mr. R .Burbidge, with his son and Mr. Thomas Skinner, the deputy-governor of the company are expected to arrive in Canada this month.

AWARDED.

Brandon, Man.

The contract for the interior woodwork for the new C.N.R. station was let to McDiarmid & Clark. The interior fittings of the main floor of the entire building will be of oak and the fittings on the upper storey of fir.

Balfour, B.C.

The contract for the excavations for the foundations of the C. P. R. Kootenay hotel here, as well as for the concrete and brick work has been awarded to John Burns & Son, Winnipeg.

Fort William, Ont.
Contract for the Canadian Bank of Commerce was awarded to Seaman & Penman, local contractors.

Halifax, N.S.
The Silliker Car Company has received a contract for construction of 250 freight cars for C.N.R. Amount of contract, about $250,000.

London, Ont.
Mr. E. W. Hyde, Toronto, was given the contract for preparing part of the Horton street station for the transformers and other machinery for $1,416, the work to be completed in two weeks.

Mahone Bay, N.S.
The contract for erection of building for Bank of Montreal here has been awarded to Kelly & Kelly, of Halifax. Dumaresq & Cobb, architects, Halifax.

New Liskeard, Ont.
The contract for erection of building for Union Bank of Canada here has been let to Hill & Clark, this place, for about $9,000, which includes foundations and excavation. J. P. MacLaren, architect, 104 Sparks street, Ottawa, Ont.

Ottawa, Ont.
Canada Foundry has been awarded the contract for the steel work of the Blackburn Building, corner of Metcalf and Sparks. W. E. Noffke, architects.

The excavation contract for the Slinn-Shouldis Company bakery on Catharine street has been awarded to Brooks & Cochrane. The excavation will total about 5,000 cubic yards. Jas. Mather, architect.

Regina, Sask.
The contract for erection of Traders Bank Building for The Times Company, Limited, this city, has been awarded to Smith Bros. & Wilson Regina, at $18,900.

Toronto, Ont.
The Norcross Bros. Company, Worcester, Mass., has been awarded the contract for construction of the head office for the Bank of Toronto here at about $1,000,000.

Vancouver, B.C.
The contract for the construction of the proposed Howe street six storey addition to the Hotel Vancouver has been awarded to Mr. J. L. Skene. W. S. Painter, chief architect, C. P. R.

Woodstock, Ont.
The contracts for extension for Canada Furniture Manufacturers, Limited, here have been awarded as follows: Messrs. Johnson & Whitehead, brick work; Cook & Griffin, carpenter work; Mr. Fowler, painting and glazing. Estimated cost, $12,000.

Power Plants, Electricity and Telephones

Barrie, Ont.
The solicitor for the Monarch Railway has written that the company is ready to start to build as soon as the council settles the franchise.

Calgary, Alta.
Tenders are being called until November 7th by the City Commissioners for supply of equipment, rails, [illegible] and overhead material for extensions to municipal street railway. W. D. Spence, city clerk.

New Westminster, B.C.
See "Business Buildings."

Ottawa, Ont.
The Quebec Railway, Light, Heat & Power Company seeks an extension of its powers and in the Canada Gazette gives notice of application for legislation at the next session for powers "to operate railways throughout Canada."

In regard to the lighting of Sparks street, it is proposed to erect 44 standards each supporting five tungsten lamps of 50 candle power, which would be placed between Sappers bridge and Bank street. The lamps would be located at the edge of the sidewalk 100 feet apart, but as they would alternate from one side to the other the distance between each light would be but 50 feet. The Ottawa Electric Light Company would furnish the lamps, standards, equipment and current, and the work can be done in a month. The residents are being canvassed as to their feeling on the matter.

Prince Albert, Sask.
The by-law to build additional boilers for power house at cost of $7,000 was carried.

The council have authorized C. H. Mitchell, of Toronto, to prepare plans, etc., for city power development at LaColle Falls. It is planned to develop 10,000 h.p. and to have everything ready to let contracts by May 1st, 1911. Expenditure, about $1,000,000.

Prince Rupert, B.C.
This municipality contemplates opening negotiations with the G. T. P. for the temporary use of the site at Seal Cove for the civic eletcric plant.

Quesnel, B.C.
A proposition is on foot to provide for a light and power plant to serve local needs. Leading business men promise support.

Saskatoon, Sask.
The council have under deliberation the establishment of a street railway. Whether under private ownership or municipal is being discussed.

Windsor, Ont.
See "Railroads."

AWARDED.

Almonte, Ont.
The contract for the erection of concrete dams at the outlets of Lakes Gull and Cross, at the headwaters of the Mississippi river, has been given to Messrs. A. C. Gilmour and Geo. Bradford of this town. Mr. J. B. McRae, of Ottawa, is consulting engineer.

Aylmer, Ont.
The tender of the Peninsula Oil & Gas Company for supply of gas was accepted and a franchise granted. Mr. Pattinson, of Chatham, represents the company.

Calgary, Alta.
The city council accepted the offer of R. S. Blome Company to lay the railway ties and rails ready for the paving of Albert street from Dewdney street to 11th avenue, through the subway at actual cost, plus 15 per cent., and to place the extra concrete required at $8.50 per cubic yard.

Estevan, Sask.
The tender of the Robb Engineering Company of $8,[illegible] for [illegible] Cross compound engine, with complete equipment, erected in Estevan, was accepted. The tender of the Canadian Westinghouse Company, of $5,083 for one 125 k.w. electric generator, switchboard, switchboard instruments, wiring inside power house, transformers, and arc light equipment as per specification of engineer, all erected in Estevan, was accepted. The tender of McKenzie & Prevost of $9,205 for the power house, was accepted.

Toronto, Ont.
Contracts for the construction of equipment were awarded to the following firms: Transformers, Canadian General Electric Company, $15,800; motor generator sets, Lancashire Dynamo & Motor Company, $2,262; storage batteries, Chapman & Walker Company, Limited, $2,870.

Toronto, Ont.
The controllers accepted the tender of the Canada Foundry Company at 4.85 per pound for the iron work of the new civic electric light poles. In the residential districts a light of the lantern design would probably be placed on cement posts. The light would be 9 1-2 feet above ground. The board asked Mr. Sweeney, general manager, civic electrical department, for a report on the limits he would advise for ornamental poles.

Miscellaneous

Hamilton, Ont.
Recent building permits include: W. A. Noble, alterations to dwelling, Bay street, corner Herkimer street, for Dr. Kelly, $2,000; W. A. Noble, brick Sunday school building, Tom street, corner Sophia street, for St. George's Church, $8,000; Jas. McNaught, brick dwelling, Main street, for Stuart Gardner, $3,000; Oliver Chilled Plow Co., brick and concrete employment and watchman's office, Gilkinson street, $2,000; A. W. Peene, brick dwelling, Holton avenue, for R. H. Hooper, $4,000; Thos. Wren, brick dwelling, Melrose avenue, $3,000.

Langley Prairie, B.C.
The Lincoln Sawmill Company has the contract to cut and dress 30,000,000 feet of lumber for Michigan capitalists.

Montreal, Que.
Recent building permits include the following: Mde. Charland & Co., 2079 St. James street, house containing two dwellings on Hutchison street, $2,750; A. Hamelin, 1902a Labelle street, three houses containing six dwellings on St. Hubert street, $5,000; L. Villemaire, 238 Frontenac street, house containing three dwellings on Galt avenue, $3,000; C. Chausse, 17 Place d'Armes Hill, two houses containing four dwellings and two stores on Laurier avenue, $12,000; A. Lamarche, Manco street, house containing three dwellings, $5,000; A. Charland, 367 Panet street, house containing two dwellings and store, on St. Catherine street east, $5,000; H. Gaffney, Notre Dame de Grace, six houses containing six dwellings on Oxford avenue, $24,000; J. H. Picard, 29 Champagne street, a 2-storey house on Marianna street, house containing five dwellings on Dufresne street, $5,800; H. Quientz, 42 St. Germain street, two houses containing ten dwellings on St. Germain street, $6,000; J. H. R. Molson, Notre Dame street east, a 3-storey brewery building on Monarque street, $[illegible]; T. [illegible], [illegible] Chambord street, two houses containing six dwellings on Breboeuf street, $4,000; E. Sauve, [illegible] street, three houses containing three dwellings and stores, on [illegible] streets, [illegible]; O. [illegible], 1848 Notre Dame street [illegible], two houses containing six dwellings on Aylwin street, $4,000; Mde. J. Rozon, 55 Fulford street, house containing three dwellings on [illegible] street, [illegible]; [illegible], 2716 St. Lawrence Boulevard, two houses containing four dwellings on [illegible]

(Continued on page 28)

Tenders and For Sale Department

Tenders Wanted

Sealed tenders will be received by the undersigned up to [illegible] o'clock p.m. TUESDAY, NOVEMBER 1st, 1910, for the construction of about [illegible] yards of Vitrified Brick Pavement with Cement Curb and Gutter in the Town of Petrolia, Ont.

Plans and specifications can be seen at the office of C. A. Jones, Esq., Town Engineer, Petrolia, Ont.

Marked cheque for $500.00, payable to the Treasurer of the Town of Petrolia, must accompany each tender.

The lowest or any tender not necessarily accepted.

J. McHATTIE,
Town Clerk.

Petrolia, October 10th, 1910. 42

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the SEVENTH DAY OF NOVEMBER, at 12 o'clock noon, for supplying to the City of Calgary Rails, Cars, Equipment and Overhead Material for extensions to Municipal Street Railway.

Full particulars and specifications may be had on application to the Commissioners, City of Calgary; marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Erection of Bridges," until the SEVENTH DAY OF NOVEMBER NEXT, at 12 o'clock noon, for the erection of steel bridges, one across the Elbow River at Twelfth Ave., and the other across the Elbow River at Second Street East.

Full particulars and specifications may be obtained from the Commissioners, City of Calgary, on application.

A marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

To
Building Contractors

Tenders are invited for the erection in Newmarket, Ont., for a large four-storey Factory Building for the Office Specialty Mfg. Co.

Tenders in bulk or separately for concrete work, brick work, carpentry, painting, plumbing, galvanized iron work and gravel roofing, will be received by the architect up to THURSDAY EVENING, OCTOBER 20TH.

Lowest or any tender not necessarily accepted.

The plans and specifications are now ready and may be seen at my office, Queen street, Newmarket, also at the office of the Contract Record, 504 Confederation Life Building, Toronto.

O. E. TENCH,
Architect.

41

Valuable Manufacturing Plant for Sale in Town of Hespeler

Pursuant to the winding-up order made in the matter of The Parkin Elevator Company, Limited, and with the approbation of the Local Master of the High Court of Justice at Berlin, sealed tenders addressed to The London and Western Trusts Company, Limited, London, Ontario, and marked "Tender for Parkin Plant" will be received up till 4 p.m. OF THE 5TH DAY OF NOVEMBER, A.D. 1910, for the purchase of the real estate, buildings, plant, machinery, stock-in-trade and assets belonging to The Parkin Elevator Company, Limited, and situate in the Town of Hespeler, Ontario, of which the following is an inventory:

(a)	Real Estate and Buildings ...	$14,936.00
(b)	Plant Equipment	6,633.00
(c)	Foundry Equipment	3,165.00
(d)	Machinery	9,580.00
(e)	Patterns	8,183.00
(f)	Patents, Prints and Tracings..	1,200.00
(g)	Office Furniture	695.00
(h)	Office Supplies	850.00
(i)	Tools	875.00
(j)	Stock-in-Trade	17,731.66
		$63,848.66

The real estate and plant will be sold subject to an existing mortgage thereon bearing interest at 4½ per cent. per annum and payable in equal annual instalments.

The buildings are new and modern in every respect and the plant is up-to-date. The Town of Hespeler is admirably situate for manufacturing purposes, having both C.P.R. and G.T.R. connections. Switches adjoin the property. Several very large manufacturing industries are located there, among others, R. Forbes Woollen Mills, Canada Machinery Company, Limited, Jardine Tool Works, Hespeler Furniture Company and W. A. Kribs' large lumber and planing mill plant.

The following is a description of the real estate: Lots numbers five and six on the north side of Sheffield street in the George D. Forbes survey.

The property will be offered subject to a reserved bid and subject to conditions of sale.

Terms: A marked cheque for one thousand dollars payable to the order of the liquidator shall accompany each tender and the balance shall be payable in cash within thirty days from the date of acceptance of tender without interest.

The Local Master will attend at his Chambers, King street, Berlin, on the 11th day of November, A.D. 1910, at four o'clock in the afternoon to consider the tenders.

For further particulars, conditions of sale, form of tender, inspection of inventory or other information apply to The London & Western Trusts Company, Limited, Liquidator, London, Ontario, on the factory premises at Hespeler, or to Melvin A. Secord, Galt, Ontario, Solicitor for the Liquidator.

J. J. A. WEIR,
Local Master at Berlin.

Dated 7th October, 1910.

MELVIN A. SECORD,
Galt, Ont.
42 Solicitor for the Liquidator.

A scraper bucket excavator has been used for placer mining in Siberia. It is said to have handled 1,700 cubic yards of old tailing per day and to have handled 593 cubic yard for 59 days, including all stops.

An application, of which notice is given in the Canada Gazette, is one by the Canadian Light & Power Company, to the Governor-in-Council for approval of its places of the proposed work in connection with the crossing of the River Chateaugay at Chateaugay, Que., with its transmission lines.

Miscellaneous

(Continued from page 27)

$4,000; N. Forget, 195 Barre street, house containing three dwellings on Lusignan street, $3,000; O. Thibeault, 863 Laurier avenue, house containing three dwellings on Laurier avenue, $3,000; A. Landry, 192 Gauthier street, house containing three dwellings on Des Erables street, $4,500; J. A. Quenneville, 1251 Des Erables street, house containing three dwellings on Parthenais street, $4,000; J. W. Deziel, 446 Lagauchetiere street east, house containing two dwellings on Church avenue, $8,000; P. Levasseur, 392 Colonial avenue, two houses containing six dwellings on 7th avenue, $4,000; G. Pare, 728 Gilford street, house containing three dwellings and store on Resther street, $3,000; A. Cohen, 36 Prince street, a furniture store building on St. Lawrence Boulevard, $24,000; H. Corbeil, 138 Garnier street, two houses containing six dwellings on Gilford street, $7,000; L. Corbeil, 1210 Chabot street, two houses containing three dwellings and two stores on Mount Royal avenue, $8,000; G. Dansereau, Grenville, Que., two houses containing six dwellings on Park avenue, $12,000; A. Lemire, 642 Cowan street, two houses containing six dwellings on Hutchison street, $8,000; E. Masse, Chambly Basin, Que., two houses containing four dwellings on Laurier avenue, $8,010; R. Genereux, 1340 Des Erables street, house containing four dwellings at 612 Cuvillier street, $2,500; J. Marsolais, 742 Dorion street, four houses containing twelve dwellings on Dorioa street, $8,0000; H. Cadotte, *Z*ottique and Huntley streets, house containing two dwellings on Huntley street, $2,700; A. P. Stewart, 2-4-6 McGill College avenue, alterations to property to cost $16,500.

Nakusp, B.C.

Mr. R. Vipont has the contract for taking all the merchantable timber off land owned by the Natural Resources Securities Company. Contract calls for 2,000,000 feet in saw logs, 100,000 railway ties and 3,000 telegraph poles.

Ottawa, Ont.

The building permits issued recently included: J. P. Band, dwelling, Centre St., R. A. Kemp, builder, $3,500; Jas. Brownlee, McLeod street, dwelling, $2,800; Richard M. Kehoe, dwelling, Woodlawn avenue, $4,000; A. Carpentier, dwelling, Main street, $7,000; Edward Gaudin, shop and dwelling, St. Patrick street, $6,000; Olive Blais, dwelling, Parkdale avenue, $3,000; Thomas Guthrie, 22nd avenue, dwelling, $2,500; S. B. Caldwell, dwelling, Blackburn avenue, $2,750; James E. Wilson, factory, Sunnyside avenue, $3,000; T. J. Somerville, dwelling, Mutchmore street, $3,000; J. E. Amyot, dwelling, Blackburn avenue, $2,500.

Toronto, Ont.

Recent building permits include: T. H. Cooper, 3 detached 2-sty. and attic brick dwellings, Russell Hill Drive, $30,000; H. Gramblatt, pair semi-detached 2-sty. brick dwellings, Fisken avenue, .4,000; C. B. Hodgson, 3 pair semi-detached 2-sty. brick dwellings, Woodville, $12,000; John O'Neil, 2-sty. brick laundry and stable, corner of River and Queen, $46,000; Mabel G. Gee, Grace street, $4,000; City of Toronto, 1 storey brick animal shelter, 2 1-2 storey brick dwelling on 454 Riverdale Park, $5,000; A. G. Love, 3 attached 2-sty. brick dwellings, on Harbord, $6,000; M. Langmuir Manufacturing Co., 3-sty. brick factory, Niagara, $10,000; C. Lock, pair semi-detached 2½-sty. brick dwellings, Crawford, $5,000; Karr & Martin, pair semi-detached 2-sty. brick dwellings, St. Clarens avenue, $6,000; J. S. A. Whealy, 2-sty. brick stable and storage, Parliament, $13,500; H. W. Sharp, pair of semi-detached 2-sty. brick dwellings, Palmerston Gardens, $6,400; H. Milligan, 2 pair semi-detached 2-sty. brick dwellings, Humberside avenue, $12,000; Robt. D. McLeod, 2-sty. brick dwelling, Walmer road, $4,000; Thompson & Mitchell, 2 pair semi-detached 2-sty. brick dwellings, Montrose, $8,000; Thompson & Mitchell, 2 pair semi-detached 2-sty. and attic brick dwellings, west side of Harbord, $8,000; Johnson & MacKenzie, 2 pair semi-detached 2-sty. roughcast dwellings, brick fronts, Endean avenue, $7,000; C. E. Fulford, Ltd., 2-sty. brick office building, on 208 Dupont street, $13,000; Robt. Simpson Co., 2-sty. steel and concrete addition to wagon shop, on Davenport, Dalhousie, $16,000; J. J. Walsh, 2-sty. brick apartments, corner Queen and Wilson, $15,000; Richard Parton, 2-sty. brick addition, east side of Clinton, $4,000.

Victoria, B.C.

Recent building permits include: A. Johns, dwelling, Manchester street, $2,500; R. E. Blakeway, dwelling, Grahame street, $2,400; J. J. Wilson, dwelling, Manchester street, $2,000; A. Johns, dwelling, Manchester street, $2,500; Mellor Bros., one-storey business block, View street, $12,000.

Winnipeg, Man.

The following building permits have recently been issued: Daykin & Scott, three houses, east side of Greenwood Place, between Portage and Wolseley, $12,000; J. H. LaPlante, house, west side of Arlington, $4,000; G. Jones, three houses, west side of Horne, $10,500 J. McCorkell, house, south side of Ross, $2,000; W. R. Keele, house, north side of Noble, $2,000; H. Brenton, house, northeast corner of Jubilee and Helen, $2,800; Lawrie Wagon Company, factory, east side of Ali, $3,000.

New Companies

Interurban Telephone Company, Limited, Toronto, Ont., incorporated, capital $200,000. Incorporators: J. S. Lovell, W. Bain, both of Toronto.

Montreal Concrete Tile, Limited, Montreal, Que., incorporated capital, $50,000. Incorporators: A. Desjardins, manufacturer, and A. Leblanc, both of Montreal.

Ojaipec Silica-Feldspar, Limited, Toronto, incorporated, capital $40,000. Incorporators: E. W. J. Owens and W. A. Proudfoot, barristers-at-law, Toronto.

Joliette Steel & Iron Foundry, Limited, Joliette, Que., incorporated capital $250,000. Incorporators: S. Vessot, manufacturer, and A. Durand, architect, both of Joliette.

Montreal Concrete Tile, Limited, Montreal, Que., capital $50,000. Incorporators: Anthime Desjardins, manufacturer; Arthur Leblanc, commercial traveller, both of Montreal.

The Ontario Gravel Freighting Company, Limited, Windsor, Ont., incorporated capital, $50,000. Incorporators: O. E. Fleming, K.C., and Chas. W. Cadwell, manufacturer, both of Windsor.

Canadian Sand Blast Company, Limited, Montreal, Que., incorporated capital $50,000. Incorporators: A. T. Stewart, manufacturer; Joseph R. Colby, manager, and E. C. Colby, superintendent, all of Montreal.

The Foley, Rieger Pulp & Paper Company, Limited, Thorold, Ont., incorporated, capital, $50,000. Incorporators: E. P. Foley, manufacturer, Thorold, and H. A. Constantine, attorney-at-law, Niagara Falls.

The Imperial Electric Company, Limited, Windsor, Ont., incorporated, capital $50,000. Incorporators: E. I. Rumsey, electrician, and W. Rumsey, merchant, Detroit, Mich.; C. P. Blachly, Walkerville, electrical engineer.

Canadian Sand Blast Company, Limited, Montreal, Que., capital $50,000; incorporated to carry on the business of cleaning buildings and materials by the process known as the sand blast process. Incorporators: Andrew T. Stewart, manufacturer; Maurice Alexander, and Darley B. Smith, clerk, all of Montreal.

Canadian Linerman Company, Limited, Woodstock, Ont., capital $160,000, incorporated to manufacture and sell wood and iron working machinery. Incorporators: D. W. Karn, Woodstock; J. A. Billinghurst, C. C. Billinghurst, bankers, and M. H. Powell and B. A. Linderman, manufacturers, al lof Muskegon, Michigan, U.S.A.

RAPID CONSTRUCTION OF A DEPARTMENT STORE BUILDING .

The celerity with which the work of constructing the department store building occupying the block front on Sixth avenue from Thirty-second to Thirty-third streets, New York City, has been the subject of wide-spread attention among contracting builders. The contract was signed April 23rd, 1909, and work was immediately commenced upon the excavation, which occupied a period of five months. The first steel columns were erected in October, this branch of the work being so well handled that 11,000 tons of steel was erected in 400 working hours, a record entirely without precedent. Fireproof tile was delivered and set at the rate of 250 loads a day. The entire steel shell was completed December 6th and the corner stone was laid December 8th, 1909.

The actual erection of the completed structure occupied seven and one-half months, the building being turned over to the owners on June 15th, 1910. The original completion date was August 1st of the present year, and the extended completion date, owing to causes beyond control, was October 1st, so that the contractors were more than 100 days ahead of schedule.

The Gimbel Building is ten storeys in height, with three storeys below grade; contains 37 acres of floor space, and is equipped with 18 elevators and a sprinkler system.

A CONCRETE LINED SHAFT IN LOOSE GROUND.

At the Zollern No. 2 pit the method of filling the waste, by waterborne stuff, has been largely adopted, and to facilitate the introduction of the packing material a shaft has been sunk from the surface to a depth of 24 m. As the only available site was immediately adjoining the washery buildings, and a loose watery stratum was adopted for securing the ground before actually excavating the shaft. The work has been described in ''Gluckauf,'' the source of these notes. An octagonal section was adopted with a clear inside diameter of 5 m, the ground to be occupied by the side walls being excavated on alternate sides of the octagon, with a breadth of excavation of 22 to 24 inches, or sufficient to allow a man to work conveniently, and a depth of 4½ m. The excavations, when lined with boards packed with hay at the joints, were filled with rammed 1: 5 concrete, giving a wall of about 20 inches thick. When sufficiently hardened, usually in about three days, the alternate sides of the octagon were similarly treated, but the ground was taken out to a greater depth, 6½ instead of 4½ m, before concreting, the object of this arrangement being to avoid lines of separation in complete horizontal rings at the different stages. When the concrete was properly hardened, the central pillar of ground was excavated, giving the actual shaft in lengths of about 5 m., and the process was repeated in 5 or 6-m lengths down to 19 m, where the ground was found to be sufficiently firm to allow the sinking to proceed in the ordinary way, the work being finished without danger or special difficulties. The cost for the whole depth of 24 m, including materials and incidental operations, was about $3,645. The time required, owing to the pauses to allow the concrete to harden, was about three months.

ELECTROLYSIS OF REINFORCED CONCRETE.

Mention has been made in these columns of the discussion that has been going on in this country and in Europe as to the corrosion of steel reinforcement of concrete structures. Little attention has been given as yet to another possible source of danger—electrolysis. Investigations, however, have been carried on by Mr. A. A. Knudson, of New York, and Mr. M. M. Glauber, of Washington University, and these are of great interest. In the tests made by Mr. Knudson there was strong evidence of electrolytic action on the embedded metal, and the concrete showed great deterioration. Large cracks appeared, and the concrete became soft and crumbly, so that in places a pen-knife could easily be thrust into it. The experiments at the Washington University gave much the same results. Cracks appeared, and there was marked loss of weight in the metal reinforcement. Mr. A. S. Langsdorf, who reported on these experiments before the Engineers' Club, of St. Louis, says:—''The cracking of the concrete may possibly be explained by the fact that the layer of rust is of rather loose consistency, so that its density is less and its volume greater than that of the original material, thus giving rise to a bursting force. The fact that the cracks are mainly radial seems to support this hypothesis. The results indicate quite clearly that great caution must be used in the construction of reinforced concrete structure where the conditions are similar to those of the tests; such, for example, as might be found in the case of bridge abutments or concrete sewers in the neighborhood of grounded railway circuits. Further information is needed as to the extent to which the reinforcement of such structures, when buried in damp or wet earth, may become part of the return circuit of trolley lines; and also to determine the insulating effect of waterproofing ingredients in the concrete.''—Stone

The B. C. Gazette gives notice of the incorporation of the following companies: Canadian Mills & Timber, Limited, capital [illegible]; [illegible] Sawmills Company, Limited, capital, $50,000; Irwin, Carver & Company, Limited, capital, $25,000, incorporated to carry on all or any of the following businesses: builders, contractors, electricians, etc.; [illegible] Lumber Company, Limited.

Wagon Trains Hauling Road Material

The widespread demand for good roads has been resulting in much good in that direction in as far as many miles of road have been let for construction recently. In type of construction these roads do not differ materially from those built in the past as they are mostly stone or gravel roads, placed in the ordinary manner, but there is a decided step on the part of many of the contractors for better and cheaper ways of doing the work, which are of interest.

An interesting piece of work of this nature is going on at the present time in Iroquois County, Illinois, where 13½ miles of stone road is under contract. The work consists essentially in grading the rough paces of the old road, placing thereon six inches of stone, averaging about three inches in size, over a width of nine feet and upon this three inches of stone screenings. No rolling is done on the road as the commissioners rely on the traffic for this.

The grading in this particular instance is done by means of a rooter on account of the compact surface of the old road, after which a road grader is used. The excavated material is banked on either side of the 9-foot roadway and is used to shoulder up the road after the placing of the stone. The force of the grading outfit consists of three men and two teams, alternating between the rooter and the grader. As the grading is very light, consisting practically in only scarifying the surface of the old road, this force was amply sufficient to keep ahead of the stone placing gang.

The problem on this particular piece of work was in getting the stone to the various parts of the road, as it necessitated in parts a haul of six miles. The contractor was unable to secure enough teams to keep the work going, as they were being used largely by the farmers engaged in threshing. As part of his equipment the contractor had a 25-horsepower traction engine, which he used in connection with the six or seven 4-yard road cars, according to the condition of the roads. The experiment proved so successful that the contractor hired another traction engine by the day. This latter was a 25-horsepower engine. Working in this manner, with the addition of from six to seven teams, the progress of the work was about one-fourth of a mile per working day of ten hours, increasing as the hauls became longer and decreasing with the length. Considerable care was used to arrange a schedule for the engines, so that empty wagons for loading were kept at the railroad siding continually, so as to get the maximum efficiency from the loaders. Of the latter the average number employed was from eighteen to twenty. The time required for unloading on the road is about ten minutes, when the engine is ready to return with empties. Eight men are employed levelling down the unloaded stone on the road and building up the shoulder.

The average number of miles traversed by the engines was about twenty-two, making from four to six trips, according to the length of the haul. It was found that when the engines were working on long hauls the coal consumption amounted to about one ton and a quarter, whereas on the shorter hauls one ton proved sufficient for a day. The hired engine was paid on a sliding scale, increasing with each mile of road traversed.

Cost figures showed by comparison that hauling with traction engines a saving of about 35 per cent. was effected, although the cost of loading gangs was increased five cents per yard. This increase was due to the fact that where teams were employed the drivers assisted in loading. This small item was more than compensated for, however, by the practical reduction of one-third by the whole process. The price per mile for the work was $2,800.

Other factors which decreased the cost of work as done by the traction engines were the fact that no large camps had to be maintained and the smaller number of men employed made their number more certain, on the average allowing the work to be prosecuted with great regularity and enabling the contractor to take advantage of the good weather.—The Contractor, Chicago.

Design of Reinforced Concrete Beams

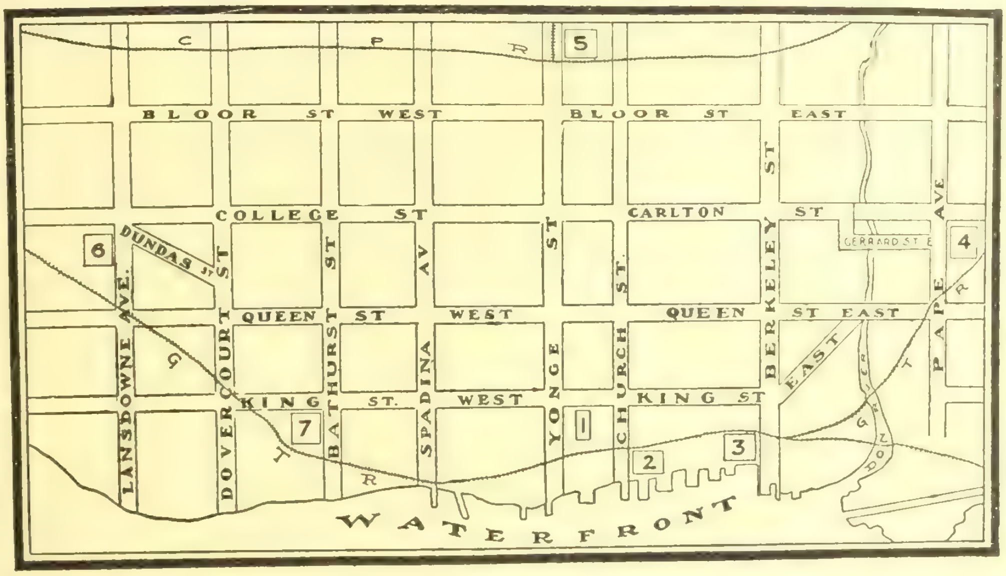
The development of reinforced concrete construction has aroused the interest of engineers in certain features of design that were not given much consideration when wood and steel were the only materials of which bridges and buildings were made. This is due primarily to the peculiar physical properties of concrete, says The Engineering Record. The tensile strength of concrete is very low and steel must be used to resist the tensile stresses. If the strength in tension were approximately equal to that in compression, there would probably not have been the great amount of testing of concrete beams, with the accompanying discussion of beam theories, that has marked the introduction of reinforced concrete as a structural material. A few years ago the theory of continuous beams was confined chiefly to structural engineers who had to do with the design of drawbridges, while now it is much more widely understood. At the beginning of reinforced concrete construction steel was placed in the lower portion of the beam only, and it was soon found that the concrete cracked at the top of the beam over the supports. This started a discussion about continuous beams which is resulting in a better understanding of their action, and hence in a more careful distribution of the steel. There is, however, one thing in the underlying principles of the continuous-beam theory that has not been given much place in the discussion. The equation of three-moments is the starting point of the whole theory. In the development of this equation the assumption is made that the moment of inertia of the cross section is constant throughout the length of the beam. This assumption is not true, however, and the influence which it has on the final design of beams should be carefully investigated.

The River Tees Transporter Bridge, between Middlesborough and Port Clarence, England, the foundation for which has recently been laid, will be of the braced cantilever type., and consists of two groups of piers erected on masonry foundations on each bank of the river. The piers will be connected by a pair of open-lattice main trusses of 371-ft. span, the underside of which will be 160 feet above the water level. These trusses will each carry, on their lower flanges, two lines of rails. On the four lines of rails there will be supports for a traveling platform. From this a traveling car will be suspended by means of steel wire ropes. The car which, it is stated in "Engineering," London, will measure 41 x 39 feet, will be fitted on each side with passenger cabins, and its centre will be devoted to a roadway for vehicular traffic. The car will be designed to accommodate 600 people and one street railway car, and will weigh about 50 tons. The ends of the journey will be landing stages at the two sides of the river, and the car will be four feet above high-water level. The car will be electrically lighted, and its motion controlled from a pilot house placed on the car, but it will also be controllable from the power house on shore.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4155

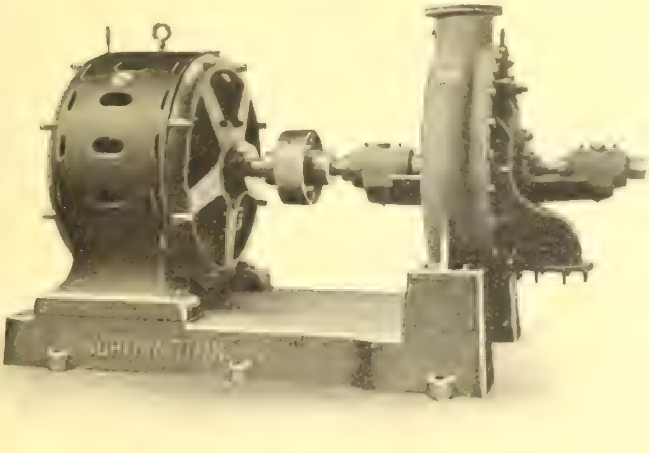


No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES

SEND FOR DESCRIPTIVE LITERATURE

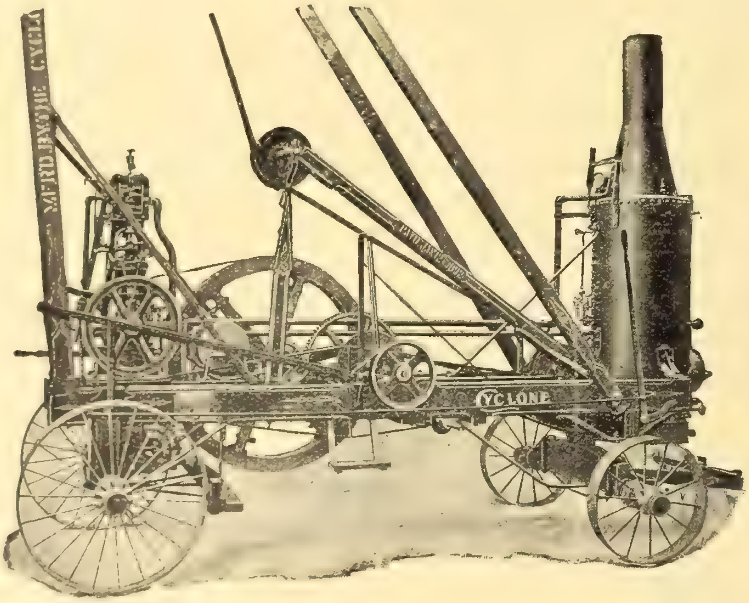
WORKS, 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

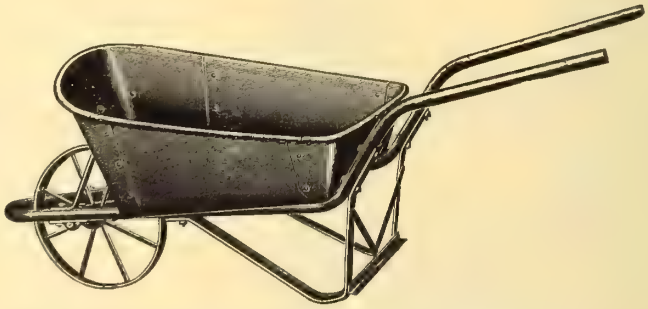
Limited

Cyclone Drills

for Blast Hole Drilling,
Well Drilling, Prospectin



Fully Illustrated
Catalogue on
application



WHEELBARROWS for all purposes in stock

Head Offices and Warehouses :
Montreal

MUSSEN

lsometer Steam Pumps

No Pistons, Rods, Glands or other moving parts such as these which get out of order so easily. Only a simple Ball Valve and two Ribbon Flap Valves.

Pump dirty and gritty water to perfection.

Simple - Durable - Convenient - Economical.

NORTON JACKS in stock

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co. LIMITED
Hamilton - Canada

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R.SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.

HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
J. R. HOOPER, Representative.
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto October 12, 1910 No. 41

Desiderata in the Training of the Engineer

We are told that there can be no over-production of properly trained engineers in Canada at this stage of our history. What is meant by "proper training"? Does our conception of it fit a man to go out into the world and make a fair competency? "The engineer," said Mr. G. R. Swain, professor of Civil Engineering at Harvard University, in an address delivered at the Worcester Polytechnic Institute, "should not only be imbued with the scientific spirit but should be possessed of business acumen. The engineer deals not simply with the design of engineering works, but with their execution and their commercial value. His usefulness will be much hampered unless he can intelligently advise not only concerning their design, but as to whether they should be designed at all, and where, and also as to their execution. He must know how to draw up a contract; how to deal with men; how to smooth difficulties; how to arbitrate differences of opinion, and, in many cases, how to manage large financial transactions. Engineering is applied science, and its application is directed, in ninety-nine cases out of a hundred, to just one thing—*to making money for somebody*. No quality will be found of greater value to the engineer than commercial acumen. The young man who looks upon engineering purely as a science, or as the art of applying science, independent of business principles will very likely remain a drudge all his life, directed by men of far less scientific ability, but of greater business acument."

The U. S. statement of imports and exports for August, 1910 published recently is of some significance to Canadian trade, having in view the protective measures that are in force over the border. The foreign goods imported into the United States during August aggregated $69,067,953 free of duty and $69,289,827 dutiable. The total of $138,357,780 is extremely high compared with $117,094,080 in August, 1909, and $91,183,536 in August, 1908. The imports were greater than the exports both in August, 1909 and 1910. This debit balance showing in the country's foreign trade, in contrast to the long record of credit balances, is still more evident in the statistics for the first eight months of 1910, compared with previous years. The excess of exports for the first eight months of 1908 was $391,369,960; for the period in 1909, $59,482,289, while the excess of imports over exports in 1910 up to September 1 amounted to $913,569.

Supervision of Scaffolding

The need for the careful supervision of all scaffolding erected in building work was emphasized again last week by a serious accident at Winnipeg. Quite recently a wall of the Manitoba Clothing Company's building collapsed, owing to the undermining of the foundation of the structure. Last week the scaffolding that had been put up for the rebuilding of this work gave way, and injured, more or less seriously, seven workmen.

Inadequate scaffolding has been a fruitful source of trouble to builders in this country, and it would be superfluous to discuss the matter at any length. The protection of his men should be an instinct with the contractor, and if he runs chances he has only himself to blame for the consequences. The law allows no contributary risk in constructional work, and rightly so. We learn that the Winnipeg bricklayers have been agitating for the appointment of an inspector to examine all scaffolding and pronounce upon its safety. The idea appeals to us as a protective measure, no more for the workman than for the master. In many cases—and possibly in this one—accidents have been absolutely unavoidable so far as the employer has been concerned. It is none too easy, however, to show this in a court of law, where all the arguments seem to veer in the direction of the injured workman or his widow. A systematic inspection by a properly certified inspector might prove to be the remedy.

Good Work of the C.N.A.B.

The Canadian National Association of Builders is proving that there are well defined reasons for its existence. Whatever may be the lethargic condition of some of the local exchanges, the Dominion Association is wide-awake. The developments of recent years have shown the necessity for the organization of master builders and contractors throughout the Dominion. The country is growing, the industry is growing and the labor unions are growing. Why should not the master builders grow in proportion? Why should they not be properly represented so that their interests are duly protected in the case of trade disputes? Why should they not secure an enactment making it compulsory to submit these matters to arbitration? These were doubtless the ideas which occurred to Mr. E. T. Nesbitt, president of the C.N.A.B., when he decided to round up Western Canada in company with Mr. J. H. Lauer, the secretary of the Association. Mr. Nesbitt is bringing the National Association into the limelight, and doing much to solidfy the interests of the master builder. The whole-hearted manner in which Mr. Nesbitt is throwing himself into this position during his year of office is suggestive of western enterprise, but it is proof rather that there are a few wise men left in the East.

The City Engineer's Estimate

The Other Side of the Story — Greater Efficiency said to Result from City Supervision

Toronto, Sept. 30, 1910.

Editor, "Contract Record":

In connection with the letter written by Mr. A. W. Godson, published in your last issue, while Mr. Godson may be actuated by the best of motives, I think his view point of the day labor system is a biased one. No credit is apparently given to the engineer for honesty in carrying out day labor work, either in regard to the making of his estimate or in the choice of materials that he uses in carrying out this work.

In regard to Mr. Godson's claim that the work is scamped by the foreman, it may be stated that the foreman as a rule does not know the amount of the bid, nor the unit prices for any portion of the work. He, therefore, has no incentive to scamp the work. Specifications for local improvements are the same whether done by day labor or by contract. Supervision is also the same. Day labor work is also subject to the same criticism by the public as contract work, and as a result the scamping of workmanship or the use of inferior material is a remote possibility. In fact, day labor work is becoming so popular in some cities that the citizens, themselves, are requesting that local improvements be done by day labor instead of by contract, as they have reached the conclusion that day labor work is efficient and absolutely honest.

The engineer is, of course, anxious to do his own construction work, and, with the facilities that can be provided by a city in the way of a plant, he is is unquestionably able to compete with the contractor on even terms. The city usually pays more for its supplies and labor than a contractor, but the greater efficiency of its labor under proper supervision, and due to the higher wages, offsets to some extent this handicap.

Bids for work are prepared by the engineer in the same manner as by the contractor. All the contingencies, for which a contractor has to provide, are included in his figures. Therefore, the bid is on even terms. In years of keen competition the engineer will show small profits just as the contractor.

There is no doubt that the engineer, when properly equipped with plant, can successfully compete with contractors, and make money for the municipality. Whether or not the fact that an engineer has made money for a municipality has any effect upon his salary, is a question that need not be discussed; but if reference were made to the remuneration received by the engineers in charge of municipal work, it would be found that their salaries do not compare favorably with those of the managers of some of the large contracting companies.

Yours truly,
G. G. Powell,
Principal Assistant City Engineer.

Significant Discussion at Vancouver

Members of the engineering profession at Vancouver, B.C., are indignant over the suggested appointment of a firm of American civil engineers to supervise the city's bridge work during the next five years. A written protest has been received by the council from Mr. C. Cartwright, of Vancouver, who considers it unfair to give such a position to American engineers without first giving an opportunity to Canadians. Nothing could be said against the standing of the firm recommended for the post, but as long as the C.P.R. and other Canadian railways, as well as large cities of the Dominion, could meet their demands in the line of bridge engineering by engaging Canadian engineers it was submitted that Vancouver might well follow their example. An American engineer was said to be an expensive luxury at Vancouver, as the engagement meant heavy travelling expenses every time a visit was made to the city, and the works in hand would also suffer because of the absence of constant personal attendance by the engineer in charge. Mention was made that on the line of the C.P.R. in the province, bridges presenting as great difficulties as the structures over False Creek, Vancouver, had recently been constructed by Canadian engineers. In consequence of this protest the matter has been referred back to the Finance Committee.

Plenty of Room for Well Qualified Engineers

Mr. R. W. Leonard, C.E., of St. Catherines, Ont., addressed some 700 science students of the University of Toronto, last week, at the opening meeting of the Engineering Society. Those present included President Falconer and Professor Galbraith, Dean of the Faculty of Applied Science.

Mr. Leonard does not consider that there is any overproduction of civil engineers in Canada at the present time, having in view the practically unlimited resources of the country. The speaker dealt with the subject of engineering in a general way. An engineer, he said, had been defined as a man who could make a dollar do the most work. While this might be true in a sense, still an engineer should recognize the fact that no expense should be spared to make his work thorough.

Are the Immigration Regulations too Stringent ?

The difficulty experienced by contractors in finding sufficient labor to carry on their work is appreciated by City Engineer Rust, of Toronto, who suggests that the Government suspend or abolish the regulation which makes it imperative for every immigrant to be in the possession of twenty-five dollars upon entering the country. Mr. Rust is of the opinion that if this enactment were done away with, labor would flow into the country from Europe, and the various construction under way in all parts of Canada would be greatly benefitted. Opposition to Mr. Rust has been shown by the legislative committee of the Trades Council, who are strongly against importing cheap labor from the United States.

A successful contractor, whose buildings are wonders of rapid erection, begun his improvements by putting himself in the place of his workmen and then he installed just such methods and appliances that cut out all unnecessary lifting or carrying. He also introduced every practical aid that would promptly present the material to the workman in its best condition and most orderly arrangement for use. The plan is not patented and is worth borrowing.

A recent legal decision once more confirms the fact that contractors on public work cannot be held to an agreement to employ none but union labor. Most contractors realize this fact, and doubtless many of them allow such provisions to be placed in contracts on the ground that it does not harm, since it cannot be enforced, and it enables some to feel the better because of its existence. As to private contracts, the matter is different.

A Movable Form for Long Concrete Walls

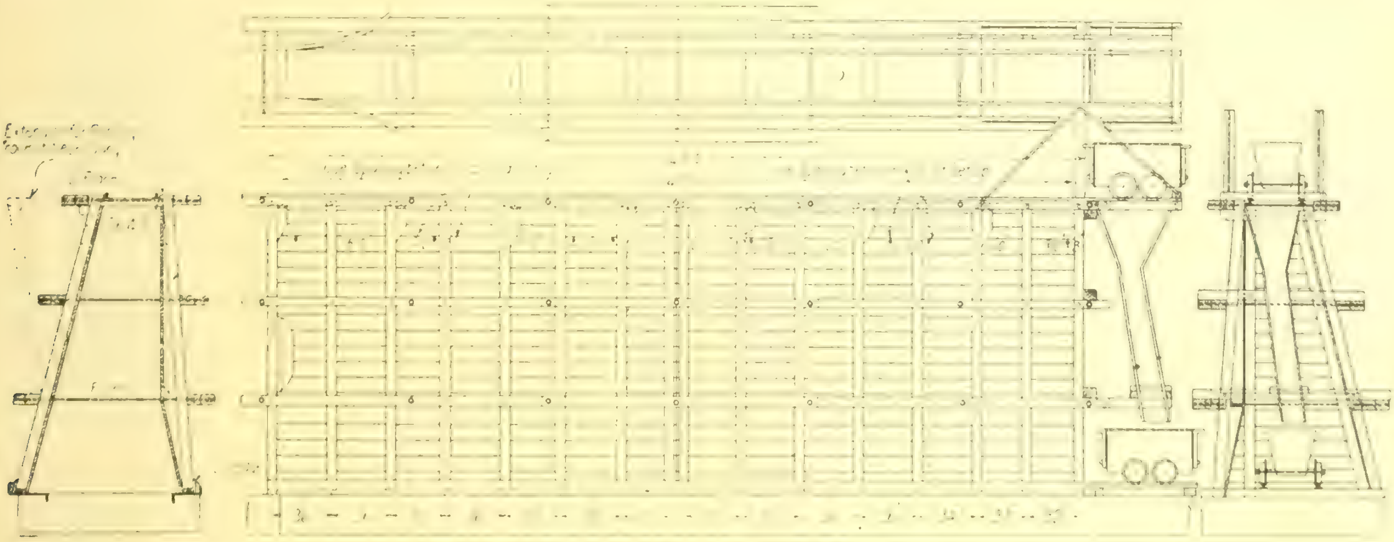
Methods and Cost of an Interesting Piece of Work on the New York State Canal—Economy of Movable Wall Form

The construction of two heavy concrete walls aggregating some 1,250 linear feet at a cost for form of less than 23 cents per cubic yard, has recently been completed at Lock 9 on the New York State Barge Canal. The accompanying article, which is extracted from Engineering-Contracting, gives interesting details of the work. The low cost was made possible by the use of a movable wall form designed by C. R. Neher, engineer for the contractors, the Atlantic Gulf & Pacific Company, of New York City. The walls constructed were the approach walls to the south end of the lock named; one, the east wall, was 350 feet long and the other on the west side was about 900 feet long.

The form, a drawing of which is shown by Fig. 1, was made of 1¼-inch lagging and 4x6-inch studding. Waling timbers, consisting of two 6x8-inch pieces placed together, were spaced about 5 feet apart, along the sides. The waling timbers were bolted securely to the studding and the front and back forms were tied together through the waling timbers by ⅞-inch bolts. As it was necessary to remove these bolts each time the form was moved these a method of preparing them for easy removal was desired. The best scheme proved to be to cover the bolts with heavy Albany grease and to wind them with Neponset paper, a heavy roofing paper. To protect the paper from being torn by falling concrete or from being stepped on by workmen in the forms, a 2x4-inch stick was placed between the form walls directly above the bolt. This acted as a spreader as well as a protection for the paper on the bolt. On top of the form, and fastened to it, were 4-foot ties for the narrow gage track. These were spaced 6 feet on centres to permit room for opening the gates of the bottom dump cars. The form was built high enough to support this track above the finished concrete. This track was joined to that on the finished wall by switch points, coming to the bent ends of the track on the wall. This saved cutting rails. See Fig. 1. One of the difficulties encountered in designing the form was the fact that anchor bolts were to be placed in the face of the wall at certain irregular intervals. This made the problem of arrangement of the studding some what intricate, but it was finally worked out by spacing the studding as shown, and using the three sets of holes, indicated, for placing the bolts.

Another difficulty was found in the fact that at intervals of 50 feet, snubbing posts were required to be placed in the wall. These posts were of such size as to require an offset in the concrete wall in order to provide sufficient anchorage. This difficulty was overcome by leaving out the snubbing posts and by placing a box on the inside of the wall form at the points for the posts, which made enough space in the wall for the snubbing posts to be put in after the wall had been completed.

The length of the form (40 feet), was designed to include enough concrete for two working days of 8 hours. The combined yardage of the base and upper neat work in 40 feet amounted to 134 cubic yards. The first day the concrete was carried to elevation 137. The second day the concrete was placed in the base ahead of the form (containing 24 cubic yards), and then the upper part of the wall was completed, containing 33 cubic yards. This made 57 cubic yards for the second day. This lesser yardage for the second day left time for the men to set molding, anchor bolts for wall fenders, finishing top surface of wall, and keys in the base.



1. Details of Movable Wall Form.

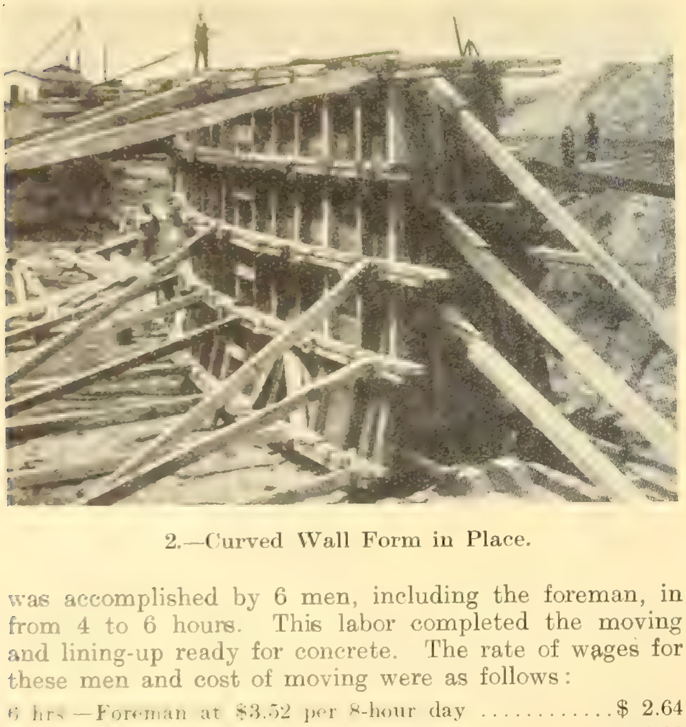
In moving the form, the bolts were removed after the concrete had set, sometimes within 12 hours. The form was then jacked up a few inches and placed on dollies. The concrete surfaces, being battered, caused the form to be clear when raised. At the top the forms were tied together by the bolts through the top waling timbers, which were always above the concrete. The form was pulled ahead with a small block and tackle. The forms were pulled ahead about 6 feet at a time and the bolts were replaced as the holes cleared the end of the concrete. This prevented the forms from spreading. At the beginning of the work it was customary to remove the end bulkhead before moving the forms, but this method was changed later and the bulkhead was allowed to remain on the wall until ready to be reset. This was done because it was found that the corners of green concrete would chip off on pulling the bulkhead; whereas, if left somewhat longer, the concrete would not chip so readily and the bulkhead would protect the corners from being scrubbed by the passing side forms.

The base of the section ahead was concreted, as mentioned above, during the second day's work, so that it was ready to receive the forms on the following day Figure 3 shows how the concrete car on top was run out over the end of the form on a piece of track supported by a truss, and dumped through a chute to the car below. This car delivered the concrete to the base.

After the forms had been removed from a section, considerable traffic was necessary on top of the green wall and therefore a protection to the concrete was made by placing a layer or roofing paper over the top and covering it with sand. The top of the wall was found to be damp after several days and in excellent condition.

For the curved sections of wall a special 40-foot section of forms was built. This form was handled in the same way as the straight form.

The labor of building each form required 3 days' time for 6 carpenters. Two straight forms were built and one curved form. The cost of these, including labor and material used, was $525.00. Spruce dressed lumber was used, at $23 per M. feet B. M. The labor of moving was accomplished by 6 men, including the foreman, in from 4 to 6 hours. This labor completed the moving and lining-up ready for concrete. The rate of wages for these men and cost of moving were as follows:



2.—Curved Wall Form in Place.

6 hrs.—Foreman at $3.52 per 8-hour day	$ 2.64
6 hrs.—2 men at $3.20 per 8-hour day	4.80
6 hrs.—2 men at $2.40 per 8-hour day	3.60
6 hrs.—1 man at $2.00 per 8-hour day	1.50
Total cost of knocking down and setting up	$12.54

The cost per cubic yard of forms and the setting up for the entire work may be estimated as follows:

Cost of material and building of 3 40-feet forms	$525.00
36 setups at $12.54	451.44
Total	$976.44
Total cubic yards + Neatwork	4.370
Cost per cubic yard concrete	$0.22 3-10

This is a very small cost, and it may be noted also, that the forms on completion of the work were in a very good condition and might have been used for three times as much wall as was built.

This method may be used to best advantage, where walls are parallel and close to gether, by placing the mixer at one end, working both walls forward at one time, and using one form on each wall. On a single wall the mixer shoud be set in the centre and the work carried from this point in both directions. This type of form for long walls secures the maximum use of forms with the minimum amount of movement and knocking down, and gives the proper sequence of form setting and placing concrete, using the average day's work of 8 hours to the best advantage.

Integral vs. Bonding Methods of Granolithic Floor Construction

There has been a considerable amount of discussion regarding the advisability of placing finish on concrete floors at the time the concrete is built, some preferring to roughen the under concrete and bond the finish to this. The arrangement in favor of doing this is that the weight of the wet concrete is likely to sag the forms, giving as they soak up water from the concrete and so giving a gradual sag which is likely to show in the upper surface. Beside this, the finish is likely to be scarred by the carpenters coming on to erect the struts for the next floor centres. If then the proper precautions are taken and good finish put down and smoothly troweled and well bonded to the under floor, it is possible to turn out a more finished upper floor surface.

However dry finish that is laid on old concrete bonds but imperfectly even with careful handling. Repeated difficulty has been experienced with finish put on afterwards, both from its becoming dusty and from its peeling off from the old concrete below. It is quite common to use acid to roughen the under concrete and to eat away the particles of cement, which adhere to the surface. Where finish has peeled, it has sometimes appeared as if the top of the concrete was rotted by this acid and that the finish was bonding to particles that were, but imperfectly held into the upper surface of the old concrete. Where the old concrete has been dry, it sucks water away from the bottom of the finish, and accordingly the finish does not get its set sufficiently and breaks away from this weakness.

One construction company, after a very extended experience with both types of construction, has found the integral method, when properly extended, superior to the bonding method. They point out that if the finish is put down at the same time as the structural concrete it is first of all cheaper, as it does away with all the labor of roughening the old concrete. It also is a unit with the rest of the concrete and acts in compression, like any other part of the top. If it is laid separately with an imperfect bond, and it is very difficult as indicated above to get a perfect bond, the inch or more of finish acts merely as a dead weight on top of the construction and necessitates heavier floor slabs. It would seem that the finish put on at the same time as the under construction and protected as carefully as possible, is very much the better practice.

In strengthening the old Lendal bridge over the River Ouse, at York, England, by the insertion of new and much heavier girders, the old girders were allowed to remain in order to retain the graceful outlines of the original structure. The new girders were somewhat higher than the older ones, and were placed between the latter, resting on the original abutments. The roadway was raised slightly in order to accommodate the higher girders, which now carry all the load. In order not to interrupt traffic the work was carried on on half of the structure at a time, the remaining half being used to carry the traffic.

Removal of the Quebec Bridge Wreckage

Resourceful Means Employed in Execution of Unique Contract—Some particulars concerning the use of the Oxy-Acetylene Cutting Apparatus

When the south anchor and cantilever arms, the latter with part of the suspended span, of the Quebec Bridge, weighing altogether about 17,000 tons, collapsed on Aug. 29, 1907, the steel of the cantilever arm was submerged in deep water except a very small portion immediately adjacent to the main pier. But the anchor-arm steel that fell between the main and anchor piers, amounting to about 9,000 tons, was wholly exposed at low tide, and was a mass of twisted and mutilated material forming a pile 70 or 80 feet wide, 500 feet long and from about 10 to 40 feet high.

Many of the heavy steel members were split, torn and ripped apart, without being broken entirely across, although thousands of rivets were sheared off, heavy plates were rolled up like strips of carpet and angles 1 inch thick were torn through like pieces of wet paper. The eye-bars were bent, but not broken or otherwise apparently injured except in one instance, where a bar was sheared through. Nearly all the principal members were still connected at the joints and the confusion and distortion of pieces made it almost impossible to extricate any of them whole from the mass.

A separate contract was awarded for the removal of the anchor-arm steel, including possibly a small portion of the cantilever arm, adjacent to the main pier, and operations were commenced in December, 1909, on the general plan of cutting the most accessible pieces on the top of the debris into easily handled sections, which were separately removed by derricks, cut into smaller pieces and sold for scrap. Work was commenced at the main pier, and to date has accomplished the removal of nearly one-half of the 9,000 tons included in the contract, clearing up nearly all of the material adjacent to the main pier, where the heaviest and largest members were concentrated. So far the members have been cut up and dislodged entirely by the use of the oxy-acetylene torch and by dynamite, and rivets have been cut out of the removed pieces by hand.

The use of dynamite is considered more economical than the torch, but it is also more dangerous and cannot be applied in all cases, so that less work has been done with it than with the torch, although it has been largely used on submerged members. The method of application is very simple and consists substantially in attaching a continuous row of sticks of dynamite to the member on the line in which it is desired to cut it, and then exploding them in the usual manner by a battery.

The dynamite is used in standard sticks 1¼ inches in diameter and 8 inches long, weighing about 10 ounces each, which are found generally to have a breaking capacity of ½ inch solid metal. That is, a continuous line of sticks laid end to end across a plate ½ inch thick will just break the plate, but if the plate is 1 inch in thickness a double line of sticks is required, and so on. The sticks are secured either by tying them to a wooden rod, wrapping them in burlap, enclosing them in a length of cheap hose, or in any other convenient way by which they can be attached to the upper or under surface of the metal as may be required. When the blast is fired on dry land the dynamite is covered with a foot or so of earth or with boards, but it is preferable to fire it under water when the water acts as tamping and produces better results from the explosion.

Occasionally the dynamite throws small and moderate size pieces of steel to a great distance. One instance recorded is of a 200-lb. piece of steel thrown to the top of a bank 800 feet away and landed about 200 feet above the point where it was blasted. Small pieces have been blown across the river, about 2,000 feet. As all of the steel thus far handled has been above low water, there was no necessity for the service of a diver and the dynamite was attached to the steel at low tide and the charges were fired at high tide.

In order to break the members into 10-ton pieces within the capacity of the derricks, it was found that about 1 lb. of dynamite was required to 1,000 lbs. of steel and a considerable quantity of dynamite has been stored in a subterranean magazine near the work. The riveted pedestals for the main bearings on the river piers weighed about 80 tons each and were not dislodged by the initial 60-lb. charge of dynamite fired under one of them. The charge was increased to 80-lb., which merely lifted it from its seat, after which a charge of 40-lb sufficed to separate the bolted sections and additional charges broke it up into pieces within the capacity of the derrick.

Sections of both of the main vertical posts over the river piers, the heaviest members in the bridge, which are supposed to be from 12 to 15 feet long, were driven deep in the ground in the falsework pier holes. Their weight is estimated at about 50 tons, but they are so firmly held in the hard ground that all efforts to dislodge them by dynamite have proved unsuccessful, as has the application of four tackles operated by a hoisting engine. It is planned to make another effort by using a pair of powerful hydraulic jacks engaging the upper ends of the members and reacting against the ground. It is believed that with these pieces can be started and afterwards withdrawn more easily.

Oxy-Acetylene Cutting Apparatus.

A large amount of the steel has been cut up by the oxy-acetylene cutting apparatus supplied by the Linde Air Products Company, of Buffalo, N.Y. A light torch is used, which is easily operated by one man with a helper to handle the oxygen cylinder and its valve. The torch has two nozzles, one for an acetylene flame, which first heats the steel to the required temperature, after which a thin jet of oxygen gas is played on it from the other nozzle and rapidly cuts a slot about ⅛ inch wide through the steel. The torch is provided with nozzles of two different sizes, and is operated at different pressures for steel up to 1½ to 6 inches thick. It cuts through a 10 x 2-inch eye-bar in 1 minute and 50 seconds using about 8 cubic feet of oxygen. A section made up of several plates riveted together, with a width of 4 feet 6 inches and a thickness of 3 3/16 inches plus a 10½ x 15/16 inch angle section, was cut through by the torch in 20 minutes 26 seconds, using 112 cubic feet of oxygen at a pressure of 10 lbs. and costing at the rate 5 cents per cubic foot.

The eye-bars 60 feet long are cut in two in the middle to facilitate handling. The riveted members are cut in two transversely as required to reduce them to convenient lengths and in some cases, as the bottom chords with four webs, it is found advantageous to cut them longitudinally through the flange cover plates. In cutting, advantage is taken of open rivet holes to reduce the cross-section, the torch being run from one hole to another. Where the different elements of a member are riveted tight together the joints between them do not cause much difficulty, except in some cases where they have been found filled with wet paint that delayed the operation until it was dried or burned away. The pieces cut in the winter were reduced only to a weight of about 50 tons, which were easily dragged over the snow and ice. It was also found that in cold weather the pieces were much more easily cut, requiring only about one-half as much dynamite as in the summer and showing a noticeable difference between a cold and a very cold day.

The acetylene gas used in the torches is manufactured in a small standard plant installed a few hundred feet from the bridge and piped to the torch in an ordinary ½-inch rubber hose at 10-lb. pressure. The oxygen gas as imported in cylinders, each containing 100 cubic feet of a nominal pressure of 1,800 lb. About 15 cylinders of oxygen are required daily for one torch. The oxygen is delivered from the cylinders through a reducing valve intended to maintain a pressure of about 10 lb. per square inch, but notwithstanding this precaution great difficulty has been experienced from leakage and ordinary tubes were not found satisfactory, so the connection to the torch is now made by ¼-inch flexible steel hose.

After being cut up the steel is removed from the wreck and handled in the storage yard by small stiff-leg derricks with interchangeable booms, which command only a small portion of the wreck and are moved from place to place as required. It is estimated that it costs about $1 per ton to cut out the rivets in the large compression members and reduce them to merchantable scrap, which is said to be sold in Montreal for $12 per ton.

Charles Koenig & Company are the contractors for removing the steel, and at present employ a force of about 25 men, using one oxy-acetylene torch and three derricks.—Engineering Record.

New Hydraulic Development at Sherbrooke

An Important Extension of the Sherbrooke Railway & Power Company —Interesting Details of Construction, Hydraulic and Electric Equipment

By J. B. Woodward, Engineer-in-Charge

Sherbrooke is the third largest city in the Province of Quebec, and is the commercial centre of the Eastern Townships. It has exceptionally good railway facilities, being on the main line of the Grand Trunk Railway; further, it is a divisional point on the Canadian Pacific Railway, the Canadian terminus of the Boston & Maine system, and the headquarters of the Quebec Central Railway Company. It is also the distributing centre for the now rapidly developing asbestos district to the north, the rich farming land of the Eastern Townships to the south and west, and the vast pulpwood limits to the north and east. Since the development of the mineral and timber resources of the district on a large scale, the population of Sherbrooke has increased very rapidly and this fact is made evident by the opening of many new streets and the activity in the building trade. Situated about two miles to the south of the city is the beautiful residential town of Lennoxville, which is given ready access to the city by a line of the street railway, on which an up to date service is maintained. Lennoxville also has the railway facilities afforded by the four roads mentioned above, and of late years several large industrial concerns have located there. The joint population of the two communities thus served by the Sherbrooke Railway & Power Company is now over twenty thousand.

Reinforced concrete dam in course of construction for the Sherbrooke Railway & Power Company.

The Magog river draining Lake Memphremagog, a body of water thirty miles long, enters a deep and narrow gorge, just above Sherbrooke, and flows through the centre of the city, emptying into the St. Francis within the city limits. There is a municipal hydro-electric plant in the gorge, supplying the city with the most efficient lighting service. After passing through the city's plant the waters of the Magog were again utilized at two lower developments to operate the old plant of the Sherbrooke Street Railway, and several industrial concerns situated on its banks. The new Sherbrooke Railway & Power Company, incorporated in 1910, took over the system of the Sherbrooke Street Railway, and acquired the water power rights on the Magog river, between the municipal plant and the St. Francis river, giving a total available head of 63 feet, by which a minimum of 4,000 horse-power can be developed. By means of dams between the lake and the gorge, the water in the lakes can be held back during the flood period, thus producing a magnificient storage by means of which a practically constant flow can be maintained the year around.

Sherbrooke is to the province of Quebec what Hamilton is to Ontario, and it has long been felt that the one thing needed to make it a most important manufacturing centre was a plentiful supply of cheap power. It was with this end in view that the Sherbrooke Railway & Power Company was incorporated. Development was commenced early this summer.

The Development.—The new development will combine the two old developments below the municipal plant and the two old dams will be discarded. A new concrete dam will be erected at the upper level, and the water carried by a large steel penstock, to the new power house, 650 feet below, thus obtaining a working head of 63 feet. Of the 4,000 horse power thus developed, about 800 horse power will be required to operate the street railway with its contemplated extensions, and the remaining 3,200 horse power will be available for industrial purposes. The power house and dam are now being constructed by the Bishop Construction Company, of Montreal, under the supervision of Messrs. Ross & Holgate, consulting engineers, who have had the entire charge of the engineering of the new company since its inception. The whole plant will be in commercial operation by November 1, 1910.

The Dam.—The new dam will be some 300 feet long, and will be buit across the rock gorge. The conditions are very favorable, as in the centre of the river at this point is a large island of solid rock. The dam will be built entirely of concrete. About 2,500 cubic yards of concrete will be utilized in its construction. It will be built in three sections, a large spillway section in the centre and bulkhead and stop log sections on the sides. A large steel plate thimble, 13 feet in diameter, will be let into the bulkhead section to convey the water into the penstock.

Penstock.—The penstock will be of steel plate, 9 feet six inches in diameter, carrying the water from the thimble in the dam down stream 650 feet to the distributing section in the power house. The penstock will be carried on reinforced concrete columns of varying heights spaced 16 feet apart and suitably anchored at different points. The penstock will be built in place and shored up, the supporting columns being constructed afterwards.

At the end of the penstock there will be a large steel stand pipe. This will be 18 feet in diameter and 56 feet 6 inches in height, mounted on a solid concrete foundation 22 feet above the tail water level. This will bring the top of the stand pipe 15 feet above the level of the head water, and with its large cubical capacity will reduce the strains on the penstock and water wheel governors to a minimum.

The Power House.—The power house will be built on solid rock just above the point where the Magog river empties into the St. Francis. It will be built of concrete up to the level of the window sills and finished in red brick. The framework for the cranes and roof trusses will be steel. The main section, comprising the water wheel and generator room, will be 110 feet long by 40 feet wide. To this will be added a gate house over the tail race, a transformer house at the downstream end, and an office section. A 15-ton travelling crane running the whole length of the building will be part of the equipment of the power house.

Hydraulic Equipment.—The three main water wheels will take their water from the distributor in the penstock through 66-inch motor-operated gate valves. They will be of the twin horizontal type, having a rated capacity of 1,325 horse power each with three-quarter gate at a speed of 360 r.p.m. The water will enter at one end of the steel plate casing, and will be discharged into the tail race through a draft tube 22 feet long, inclined at 30° to the vertical. The governing of these units will be effected by Lombard governors of liberal capacity to insure a very close regulation. One of these wheels already completed has just been tested at Holyoke. The results of the test show that a very high efficiency of 85% was obtained at slightly over three-quarter gate.

The two exciter turbines having a capacity of 100 horse power each at 750 r.p.m. will be of the single horizontal scroll-case type. They will take their water from a common feeder opening from the stand pipe through hand-operated gate vaves. They will be controlled by Woodward governors.

Electric Equipment.—This part of the installation has been carefully designed to conform with the very best modern standards. The three main units will have a rated capacity of 940 KVR at 2,300 volts, 3-phase, 60 cycles, 360 r.p.m These generators are of rather special design in order to insure close regulation and absence of hunting. The rotors will have a weight of 24,000 bs. each, giving a fly-wheel effect of 100,000-foot lbs. The exciters will each have a capacity of 50 K W at 125 volts The power from the main units will be taken to the switchboard and distributed to the local feeders—railway motor generator sets, and transformers for long distance, transmission lines. The power for the railway will be obtained from two induction motor generator sets, having a capacity of 250 K W. each at 550 volts. As in the case of the main units, these machines are of special design to meet the requirements of the fluctuating load of the railway, without interfering with the voltage regulation of the plant.

The power of transmission will be raised to 22,000

Site on Magog River, showing substructure of new power development for Sherbrooke Railway & Power Company volts by means of these single phase transformers, which have a capacity of 677 KVA each.

The switchboard will consist of 11 marble panels and will be equipped with instruments and protective devices of the most modern type to guarantee against breakdown, and to insure a constant and reliable service with good regulation.

The power house equipment will be protected from lightning troubles by electrolytic lightning arresters.

Transmission Line.—The charter of the company gives it the right to transmit and sell power throughout the St. Francis district. This will open up to the company a large district rich in minerals and timber, which has hitherto been greatly handicapped in its development by reason of a lack of power. A close study of the district has been made, and transmission lines will be run from the power house covering the district within a radium of 30 miles. The transmission will be at 22,000 volts, the lines being carried on wooden poles, spaced 100 feet apart. Already several large contracts have been made for power, and the transmission lines will be pushed forward as rapidly as possible along with the rest of the development where the work has been carried on by both night and day shifts since the spring.

The Railway.—The street railway was built some 12 years ago, and while the traffic has been large and the returns good, it was felt that they could be greatly increased by extensions, and a general reconstruction of the system. The population of the city has more than doubled since the road was constructed. The present system consists of seven miles of track, including the line to Lennoxville. The old system will be entirey relaid, and extensions amounting to six miles will be constructed at the present time. The rails to be used for this work will be of the 70-lb. girder type—60 feet long, 7 inches deep. These will be laid on new ties throughout, and will be held by tie rods, and well bonded. Orders have already been placed for eight new cars. These will be of the pay-as-you-enter single-ended type and will have cross seats. They will be equipped with two 50 horse power motors. There are at present sixteen passenger cars operating on the system. The rolling stock will be further supplemented by the addition of a new snow plough and sweeper.

With this new equipment the service will be much improved. Already the service has been reduced from a 20-minute to a 5-minute one, and this will be further improved when the new equipment is received. To accommodate the new rolling stock, large extensions to the car barns and shops are contemplated.

Notes on the Drainage of Country Roads

Proper Drainage the Fundamental Principle of Road Construction—Satisfactory Systems of Surface and Under-Drainage—The V-drain for sub-soil

By V. M. Peirce, Chief Engineer Dept. of Agriculture, Washington

The most important principle involved in road building is that of thorough and proper drainage. The soil upon which the road bed is placed must eventually bear the loads passing over the road. The intensity of the pressure is, of course, not nearly so great on the soil as on the wearing surface of the road, since the severe wheel pressure becomes distributed over a much larger area, the distribution depending on the thickness, character and condition of the roadway materials. But, whatever the distribution, the load is finally transmitted to the soil.

The ability of the earth to sustain a load depends largely upon the absence of moisture in it. Most soils can be so compacted as to form a good firm foundation as long as they are kept dry, but on the entrance of water they become soft and incoherent and largely lose their sustaining power. In cold climates there is the additional damage due to freezing, but frost has no disturbing effect on dry material. Therefore, it is the entrance of water which is to be guarded against in every possible way.

Drianage consists of two kinds; surface and under drainage. Surface drainage is accomplished by using more or less impervious material for the road surface and by having the surface of such form that water falling upon it will quickly run into the gutters or ditches. The great majority of our improved country roads have a cross section which may be said to be formed of two sloping planes with their intersection slightly rounded along the centre line of the road. The side slopes toward the ditches vary from ⅜ inch to 1 inch to the linear foot. For plain macadam roads having a surfaced width of 12 to 16 feet, ¾ to ½ inch to the foot is very commonly used. The earth shoulders from the stone to the ditch are usually given a slope of 1 inch to 1½ inches to the foot, which has been found to be very satisfactory. Very little has yet been done to determine the most suitable side slope for various grades. The formula

$$H = \frac{W\ (100-4P)}{5{,}000}$$ for the crown of a roadway, where H

equals the crown in feet, W equals the width of road in feet from shoulder to shoulder, and P equals the per cent. of grade of the road, has probably been used more than any other in this country, but it is by no means perfect, and further investigations are needed on this subject.

The ditches and cross drains must be of ample size to care for the largest storm flow, and since the rainfal varies very largely, it is at once plain why the practice is so varied as to the size, shape, and grade of ditches and culverts. Where practicable, however, the grade of the bottom of a ditch should not be less than 6 inches to the 100 feet. On our country roads the gutters, or side ditches, are as a rule unpaved except on steep grades where the velocity and volume of the runoff are sufficient to produce appreciable scour or erosion.

Cross drains or culverts are constructed of wood, eathenware, iron and cement pipes, and concrete both plain and reinforced. Wood as a material for cross drains is rapidly going out of use and should be discarded entirely. For the smaller waterways terra cotta and cement pipes serve fairly well in the warmer climates. In the extremely cold sections the terra cotta and plain cement pipes are very often broken by becoming clogged in time of a thaw, which is followed by a sudden, hard freeze. Iron and reinforced concrete do not seem to be injured in this way, and the latter should be used for the construction of all of the larger culverts.

---

*Extract from paper presented to the Second International Road Congress at Brussels.

All culverts which are built with any of these materials should have their ends protected by concrete construction, in order to prevent the washing away of materials adjacent to the ends or of the culvert itself. An illustration of the washing away of a corrugated iron pipe culvert is included, which shows its failure to the lack of being provided with concrete ends.

Under-drainage involves the removal of the ground water to a sufficient depth to prevent it from injuring the road, and this depth should be varied according to the climate and the character of the soil, never being less than 2 feet below the elevation of the road surface. The general method of removing the ground water is by drain tile from 4 to 12 inches in diameter, laid on a true grade, and not less than 3 feet below the crown of the road. There may be a line of such tile on both sides of the road, a single line on one side, or a single line down the middle of the road. When the direction of flow of the ground water is found to be strongly from one side, as is usually the case in side-hill construction, a single line of pipe cutting it off before it reaches the road will be sufficient. In low and swampy land, not having a well defined under flow, and in heavy retentive soils a line of tile on each side will be necessary to properly protect the road. In the latter kind of soils the tile should be laid on about 4 inches of coarse sand or fine gravel and then covered to a depth of at least 1 foot with similar material. This not only insures that the joints and pores of the tile will not become clogged with the almost impervious clay, but it also gives a larger collecting area for the percolating soil water.

One of the later methods employed to drain the subsoil, which has given satisfaction, is the construction of the V-drain. In this work the subgrade should be excavated for the full width of the surfaced roadway and from 6 to 8 inches deeper at the sides and from 12 to 18 inches at the centre than usual, thus producing a flattened V-shaped trench. This extra excavation is made in order to be filled with pebbles and boulders varying in size form ½ to 12 inches in their longest dimensions and having the largest stone placed in the bottom of the trench, which should be graded longitudinally so that the water will run along easily. These stones do not have to be deposited carefully, but should be so placed that they may be compacted with a roller to form a suitable foundation for surfacing. The water drained by such construction should be carried to the outlets provided, through narrow trenches filled with similar sized stones, as should the water drained by all forms of sub-surface drainage be carried to the side ditches, culverts, or open waterways through their own similar forms of construction.

Details of the practice of sub-drainage vary largely in the different sections, but the employment of longitudinally tiled and V-shaped drains to collect and carry off the water is very extensive and rapidly increasing. Road builders are learning more and more from experience that as a rule it is cheaper in the end and more satisfactory to drain than to lay expensive foundations. To keep the earth dry, hard, and unyielding is necessary to secure the low cost of maintenance and long life of a road. Therefore, the water falling on the road must be carried off quickly and effectively and the water from below must be intercepted and removed before it reaches the roadbed where it can do damage.

The discovery of an unlimited quantity of fine silica sand, is reported from St. Anne's Man. Development work will probably be entered upon shortly.

Data on Laying Concrete Base for Streets

A large amount of new street paving is at present being laid at Grand Haven, Mich. Several streets in the vicinity of the Grand Trunk station are being improved with brick with cement filler and pitch joints. There is a total of about 4,300 feet of that work in the locality. The subgrade is sand, the base 6 inches of gravel concrete and the wearing surface paving brick. Metropolitan Paving Brick Company, of Canton, Ohio.

The subgrade is first rolled compact and smooth with a road roller, and then the concrete gravel and sand are dumped in two parallel windrows near the middle of the street. A continuous concrete mixer is then brought along between the windrows, using the materials from them by direct shovelling and leaving the finished base slab behind. The concrete is distributed with the aid of wheelbarrows, the greatest haul being about 30 feet.

Representative progress and cost data on this work is as follows. A section 285 feet long and 21 feet wide, embracing 665 square yards and containing 11 cubic yards of concrete was laid in a 10-hour day with the following force:

1 Foreman		$5.00
1 Engineer		2.50
2 Men shovelling gravel	@ $2.50	5.00
2 Men shovelling gravel	@ 2.00	4.00
4 Men wheeling concrete	@ 2.00	4.00
3 Men spreading concrete	@ 2.00	6.00
2 Men handling cement at mixer	@ 2.00	4.00
¼ Ton coal		1.00
Oil and waste (estimated)		.25
Total		$35.75

The unit cost of mixing and laying, figured on this basis, was $0.054 per square yard, or $0.323 per cubic yard. This work was done in July.

On another section, laid in August, where the concrete was shovelled directly from the mixer into place, and therefore no barrows were used, a representative record is as follows: A section 180 feet long and 28 feet wide, embracing 560 square yards and containing 93⅓ cubic yards, was laid in a day of 10 hours. The equipment and methods were the same as above, with the exception of the barrows. The distribution of forces was:

1 Foreman		$5.00
1 Engineer		2.50
2 Men shovelling gravel	@ $2.50	5.00
2 Men handling cement at mixer	@ 2.00	4.00
8 Men spreading concrete	@ 2.00	16.00
¼ Ton coal		1.00
Oil and waste (estimated)		.25
Total		$33.75

The unit costs on this basis were $0.061 per square yard, or $0.362 per cubic yard.—"The Contractor," Chicago.

In a forcible address delivered recently at St. Peters, C.B., Hon. A. J. McLean, Attorney-General for Nova Scotia, called attention to the importance of the good roads movement and outlined the Government's policy in this regard. He stated that at its next session the Government would introduce legislation looking to the expenditure of a considerable sum of money for permanent improvements to the highways of the province, according to detailed reports to be submitted from each district.

Two Attractive Residences at Chatham, Ont.

We have pleasure in publishing herewith photos of two attractive residences erected at Chatham, Ont., last season in accordance with the designs of Messrs. J. L. Wilson & Son, architects, of that city.

The stone and shingle residence was built with entrance, reception hall and staircase from front to rear, connecting with kitchen, refrigerator room, etc. On entering at front door, through an arch on the left is a living room, 13 feet 4 inches x 27 feet, containing a wide fireplace. To the right of entrance and reception hall are the library, also containing a fireplace, and the dining room.

Stone and Shingle House built for Mr. A. D. Westman. Cost $6,000.

The second floor contains four bedrooms and bath, with stair to maid's room and storage in attic. The basement arrangement includes laundry room, cool room and storage; hot water heating.

The Richardson residence shows how effectively shingles can be used for a frame exterior. The ground floor contains living room, with bay at front, with slide doors into dining room immediately at rear, connected to kitchen, refrigerator room, etc., by means of a serving pantry. On entering there is a reception hall in which is a staircase to second floor appointments. The one-storey annex, on the left side of residence, contains a den with bookcases, window seat, etc. The second floor contains four bedrooms and bathroom, with stairway to attic, which also contains maid's room and storage. The basement arrangement includes laundry room, boiler room, cool room and storage.

The Toronto Board of Control have endorsed Park Commissioner Wilson's scheme for the improvement of University Avenue. No amount has yet been named for carrying out the work, but it is to be hoped that the city council will appreciate sufficiently the opportunities provided by the scheme to make proper provision for doing it ample justice.

The prosperity of the C. P. R. was indicated clearly in Sir Thomas Shaughnessy's presidential address at the 29th annual meeting of the company last week. The gross revenue, exclusive of ocean steamships, shows an increase over the previous year of $18,600,000, the working expenses, an increase of $7,700,000, and the earnings an increase of $10,900,000. In reality the actual result was somewhat better than this, as the directors thought it wise to create at the cost of working expenses an additional fund of $2,700,000 to provide for maintenance works contemplated. Sir Thomas held that these figures furnish conclusive evidence of the growth and progress of the country. The speaker touched in a general way upon the extensive ship-building programme which the company now has under consideration. In this connection an interesting statement may be expected at an early date.

That there is scope for the larger contracting concerns to provide themselves with adequate facilities for handling big work, seems to be indicated by the letting of the contract for the new million-dollar Bank of Toronto, which is to be erected at the corner of King and Bay Streets, Toronto, to Norcross & Co., of Worcester, Mass.

Mr. Eustace Bird, Toronto, representative of Messrs. Carrere & Hastings, of New York, the architects for the proposed building, states that local firms were given an opportunity to do the work, but were unable to take it, owing to the difficulty in handling the marble. Mr. Bird state: "No Canadian firm has ever yet prepared marble for outside work. They have for interiors, but there have never been any mills for the cutting of the big slabs that go to make up the walls. I may say, however, that in this present job such a mill will be installed, and all the marble cut here with local labor."

Commissioner C. F. Roland, of the Winnipeg Development and Industrial Burea, thinks that there should be no necessity for local manufacturers to deposit certified chequest with municipal tenders. He has laid the matter before the Board of Control at Winnipeg with the recommendation that established local concerns be not compelled to deposit cheques with their bids.

Mr. Thos. Richardson's Shingled Residence built at a cost of $3,500.

In regard to Mr. Jacobson's criticism of the unfair manner in which Scandinavain railroad laborers are treated in Canada, Mr. J. W. Stewart, of Messrs. Foley, Welsh & Stewart, deplores anything that may tend to discourage immigration from this source. He declares that the Swedes and Norwegians are the most desirable of the immigrants to this country from Europe, being steady, industrious and reliable.

Notes on the Qualities of Steel Pipe Lines

Useful Observations from Modern Practice — Relative Merits of Wrought-Iron and Steel Plates Interesting Discussion on the Subject

Of a number of particularly valuable papers presented at the annual convention of the New England Waterworks Association held at Rochester, N. Y., Sept 21-23, 1910, we think none of the other authors will begrudge giving first place to the paper on steel pipe lines, by Mr. Emil Kuichling, consulting engineer, New York City, says the Engineering News. The impossibility of giving detailed information from this paper in a report of the proceedings of the whole convention will be understood when it is stated that Mr. Kuichling used about an hour in presenting an abstract only of the paper. All that can be attempted here will be to convey a general idea of the contents of the paper and the object of the author in presenting it. Speaking of the object first, it may be said that the author's aim was to make a thorough canvass of what is not known and what remains to be learned regarding steel pipe. On concluding his abstract of his paper, he said that an equally long paper could readily be prepared on the good points of steel pipe lines, but that pleasant task he would leave to others. In the course of his paper Mr. Kuichling gave a quite extensive review of the history and practice of steel pipe line construction. Naturally, the author devoted a considerable amount of time to the wrought-iron and the steel pipe lines at Rochester, with both of which Mr. Kuichling was connected. He also dwelt upon the relative merits of wrought-iron and steel plates as material for riveted pipe, and brought out clearly the evident great superiority of wrought-iron on the point of corrosion resistance. We hardly need remind our readers that comparatively few leaks have developed in the wrought-iron pipe line at Rochester after some 35 years of use, while in comparison the steel line developed many leaks within a few years

The idea should not be gotten that Mr. Kuichling's paper was devoted wholly to the quality and corrosion resistance of steel pipe. He also discussed deformation. Here also his aim was to call attention to what is not known rather than what is known on the subject.

In discussing the paper, Mr. E. A. Fisher remarked that some people have an idea that the Rochester steel conduit is going to pieces. This is far from the truth. While there has been corrosion and leakage, the corrosion is confined to pitting, and the general strength of the conduit is not affected. Some $8,000 to $10,000 a year are spent in repairs consisting generally of uncovering the pipe each way from leaks and recoating it. Altogether, less than three miles have been recoated out of the total length of 26½ miles.

In the course of the discussion Mr. Francis H. Luce, of Woodhaven, N.Y., gave some information regarding the changes in the manufacture of enameled kitchen ware which he thought explained why steel pipe was so much more readily attacked by rust than wrought-iron. Mr. Luce said that prior to 1890 the old-fashioned charcoal iron [illegible] was used for kitchen utensils. Such utensils would last for a great many years. On changing to steel great difficulty was experienced in making the enamel adhere, and special means to that end had to be devised. He thought the lack of adhesion was largely due to the fact that the steel is not nearly so porous as the wrought-iron.

Mr. L. M. Hastings, city engineer of Cambridge, Mass., stated that the steel pipe which he put in many years ago followed the Rochester specifications in general. The Sabin coating was used at Cambridge (as it also was used on the sections of the Rochester pipe which have corroded least). Mr. Hastings stated that heating the metal before dipping the pipe to apply the Sabin coating opened the pores so that the coating penetrated better and thus had greater adhesion subsequently. So far as he knew, his pipe line was well preserved.

Mr. W. C. Hawley, of Wilkinsburg, Pa., who was formerly located at Altantic City, told how the steel pipe laid across salt marshes had gone to pieces there. This pipe was laid against the advice of Mr. Hawley and Mr. Kuichling and against the wishes of the water commissioners, the city council setting itself up over all these and not permitting the use of wood stave pipe, as had been recommended by the engineers named. It is interesting to note that a 48-inch pipe line is now being laid, or will soon be laid, across the meadows at Atlantic City. The Atlantic City steel pipe line was laid some nine years ago. The pipe was coated with "mineral rubber," and had burlap wrapped around and pressed into the hot coating in order to afford protection in transportation. Pipe for the first half mile laid was carted across the meadows. Subsequently, the pipe was rolled 600 to 800 feet across the meadows, which were frozen at the time. About a hundred leaks soon occurred in the portion of the pipe line, the pipe for which had been rolled, while only a few leaks occurred on that which had been hauled. This, of course, was explained by damage to the coating caused by rolling the pipe.

Mr. Allen Hazen's Experience

Mr. Allen Hazen* expressed himself strongly in favor of steel pipe. He used it first at Albany a number of years ago. Recently at Springfield, the lowest bids for conduit were at the rate of $2 per foot for steel pipe, against $3 for cast-iron pipe. He believed that ultimately steel would be used for all pipe lines larger than 36 inches. As to the use of wrought-iron, Mr. Hazen remarked that there was a difficulty in rolling this in large plates, especially where locked joints were used longitudinally. He understood that the ingot iron can be rolled in as large plates as the steel so that for this and other reasons he considered the ingot iron promising.

Mr. Morris Knowles stated that the considerable amount of steel pipe that had been used in and around Pittsburg had given general satisfaction. Mr. Robert Spurr, Weston, described the open-hearth steel process in its relation to the question under discussion. The large ingots from the furnaces cool in a way similar to the formation of ice in cakes; that is, with the concentration of the impurities at the centre. When the ingots are rolled these impurities are unevenly distributed and thus give rise to unequal electric resistance in different parts of the plates, and consequently to concentration of corrosion since corrosion, as it is now known, is due to electric action. The first requisite of coating, of course, is to keep water from the pipe. The Sabin coating is better than others because it is baked on and in and thus excludes water. Unsatisfactory results sometimes had with Trinidad asphalt are in part due to the fact that this material includes some 25% of non-bituminous matter, which is dissolved by the action of the water, thus leaving the coating porous. The purely bituminous products are therefore more desirable.

According to a statement issued by City Engineer Jones, of Brantford, Ont., the building permits issued in that city to date amount to $417,760. The total for 1907, the record year, [illegible]

---

* Consulting Engineer to the City of Toronto.

The Constituent Materials of Concrete

An Instructive Article Containing Information of Practical Value to Contractors Failures not Infrequently Due to Ignorance of Materials

By Russell S. Greenman*

Concrete is called artificial stone. There is really no doubt that good concrete is an artificial stone, but it is also something more. It has certain characteristics of a stone, but there are some things so decidedly characteristic about concrete that it differs from stone and assumes an individuality of its own. To make a clear distinction is not an easy task, but as we learn more about concrete, we see more clearly how concrete varies from stone, just as stone varies from brick. To make concrete there are certain essential materials. These are commonly listed as cement, sand and stone. One other material is important—water. For sand and stone there are several substitutes. It is generally acknowledged that the cement for all large works should be subjected to rigid inspection and tests. On very large works the sand and stone also are carefully inspected. On smaller works the cement has sometimes been tested, but the sand and stone have often been given no more than a casual inspection. Invariably the blame for failures has been placed upon the cement. And often these failures have been not only disastrous financially, but have also caused the loss of life. Many failures, doubtless, are due to a lack of proper supervision, but in some cases ignorance of the materials used has permitted the too early removale of the forms and centreing. In once case, known to the writer, shavings and small blocks were swept into the forms; a column collapsed and four lives were the cost of this negligence. A port-mortem examination can not restore life; the best it can do is to suggest some way of using the knowledge gained to prevent future losses. So when concrete fails, a post-mortem examination shows that proper inspection of workmanship and materials would have prevented the failure.

Modern hydraulic cement is of very recent introduction into many of its present uses. Hydraulic cements have been made for nearly a century, but the cement of 50 years ago—yes, of 25 years ago—was not the cement of to-day. The latter-day cement that is most generally used is called Portland. Unless concrete is to be put to some extraordinary use, the cement should have certain characteristic qualities. First of all it should be sound, also it should be ground to a certain degree of fineness; it should not set, or harden, too quickly, and it should show, in tests, a good tensile strength. Generally the smaller users take it for granted that a cement of established reputation will always possess these good qualities and they purchase and accept cement on the name of the brand. Such a practice can hardly be called safe, for mistakes occur in the best regulated families and some times even the best mill may turn out some lots of poor cement. Cement is unsound usually, because it is green, not having had time to cure. After the cement clinker, or the finished cement, has been stored until the free lime has become hydrated, or slaked, the cement generally becomes a safe cement to use. A future cause for failure in this same cement may be from an excess of sulphuric anhydride or any excess of magnesia. An excess of either of these can ultimately destroy what is apparently good concrete.

Upon the fineness of cement depends to a great extent its strength. It is the fiber particles that have hydraulic activity. The coarse particles are practically inert and act as so much fine sand. It must not be understood that, of two brands of cement, the finer is necessarily the better, but, of the same kind of cement, that which is the finer is apt to produce better results. There is, however, a minimum percentage for the different degrees of fineness, above which all cement should be ground.

The setting of cement, as defined and limited in specifications, may or may not be important—with one distinct exception. It may matter little in the majority of cases whether or not the cement takes 30 minutes or four hours to take its initial set, as the large majority of cement users have the concrete well in place within the minimum time allowed, and only in cases where there is some delay does it make a difference. The exception which always does become a matter of importance, however, occurs when the cement takes what is called a flash set—setting hard in a very few minutes. Cement of this nature is decidedly improper and its use should not be allowed.

Setting and Hardening.

There must, too, be a distinction made between the setting of cement and the hardening, for the latter is of much importance in the making and care of concrete. The setting of cement may be considered as being limited to that time when the cement is undergoing the first chemical action, when the cement crystals are being formed; the hardening of cement takes place at that time when the cement crystals are gaining strength and continuing more slowly the chemical action which began in the setting. It is of vital importance for one to know that he may be using a slow strength-getting cement. The removal of forms or centreing, the care of the concrete itself, the time at which it is safe to place a load upon the concrete—all these depend upon the rapidity of the growth in strength.

The first consideration in the selection of sand is generally that of cost. The contractor may be willing to pay a larger price for his cement, in order that he may be reasonably sure of securing a satisfactory product, but the sand must be the cheapest that can be procured. This demand of cost, however, is gradually assuming its proper place, namely, at least partially subservient to those qualities which will produce required results. What these qualities are depend largely upon the use to be made of the concrete, but, as a general rule, the sand must be composed of hard grains; it must be composed of well graded particles. It must not have too large a percentage of voids, and it must not contain too much loam and organic matter. However, it must be admitted that it is practically impossible to secure an ideal natural sand, but some sands are so far from the ideal that their use is impossible.

The character of the sand grains is important. The smaller grains are generally quartz, with occasionally some feldspar. The larger grains are particles from broken down sandstone or are particles of shale. As long a sthe sandstone grains are not from decaying stone these sands are all right; when, however, they are soft and easily crushed, they will be much weaker than the cement and add no strength to the mortar. Shale grains are apt to be much weaker than the cement, and if exposed to the weather have a tendency to disintegrate, but with a rich mortar each sand grain would thus be protected from the weather. Feldspar should be coated with cement, and the grain also has a tendency to disintegrate and its proportion in sand should not be too great. Such sands as contain much mica do not make good sands for concrete, as the mica greatly reduces the strength.

If sands are well graded the percentages of voids are greatly reduced. It is possible by artificial mixture to secure materials with very few voids. For special uses this may be done. For general use it is not practical, but such natural sand should be selected as will show the best graduation in the size of its grains. As an illustration, a mortar of the proportion of one cement to three sand, in which the sand is fine and contains 40 per cent of voids, will have about 7 per cent. of space, filled with only water and air. What then can be expected of some of the lean mortars such as are being used in some modern cement work? It has been generally specified that sand shall be a sharp, clean sand. In very recent years we have come to admit that good cement will adhere to a round surface as well as to a sharp, flat surface. We have just seen that a round-grained sand contains less voids than the sharp sand. The word "sharp" is gradually being stricken from the specifications and the words "well graded" are being inserted in its place.

---

* Engineer in charge of Illinois State Testing Laboratory.

There is often used as a substitute for sand the finer product of the stone crushed for use in concrete or macadam. This product is called crusher dust, or screening, it often makes a splendid substitute for sand; in fact, it often produces better concrete. This will happen when the particles are well graded, the use of either sandstone or limestone screening proving very satisfactory. It often happens, however, that the screening contains a large percent of very fine dust, and with this there is also a large amount of particles of about one-quarter to one-half inch size, without a proper proportion of the intermediate grades or sizes. The result is, that, when used in concrete, the cement becomes adulterated with the fine dust and the concrete is weakened. It is true that this fine dust will aid in producing an impervious concrete, but it also makes a more tender concrete—one that will not well stand the shock of impact. There has been introduced into some use within the past few years a waste product that makes a very satisfactory substitute for sand, namely, iron ore ailings. As a rule this is well graded material and produces a very satisfactory mortar.

Selection of Stone.

The selection of the stone to be used as the aggregate for concrete should be given very careful consideration. It frequently happens that a gravel can be secured more easily and more cheaply than a satisfactory crushed stone. As a result we have two main classes of concrete—broken stone and gravel. Both have good points in their favor. Another kind—cinder concrete—has a field of its own and is the best concrete that can be used under certain conditions. In the selection of the stone or gravel we have problems similar to those which are presented in the selection of sand. The same question of voids, size, the grading of the stone and the cleanness are all vital considerations. There is also the further question of strength. It is necessary that, since the stone forms by far the larger part of the concrete, it shall have a strength approximately the same as the cement. The kind of stone is the first point to be given consideration, the selection depending somewhat upon the use to be made of the concrete. Good, hard stone is absolutely essential. Hardness and toughness, density and weight help to determine the stone. Trap-rock and granite generally produce the best concrete; hard limestone and gneiss also give good results; sandstones are generally quite as satisfactory, but stones of a shaly nature should be avoided. When gravel is used, it is equally important that it should be composed of good, hard pebbles. Shaly gravel should not be used. All stone or gravel of a soft or decomposed nature should not be permitted in concrete.

The question of cleanness is very important. It is almost sure destruction to concrete if the stone is coated with loam. The coating prevents a proper adhesion of the cement to the stone and with this lack of adhesion the concrete becomes similar to honeycomb—sawdust is then just as useful as stone. One of the arguments made against gravel concrete is that there is a greater danger of the pebbles being coated with dirt. It is often not only advisable, but necessary to wash the gravel. In this case it might be a better plan to secure crushed stone, as a freshly crushed stone should not be coated with dirt.

Quantity of Water Used.

The question of quantity of water used in mixing concrete is not always a vital one. Where massive concrete work is put in place, large quantities of water are used and the supply naturally will be a satisfactory one. There are times, however, when small structures are to be erected at some point distant from a large supply of water. It is natural that the contractor should then look for the nearest supply. The source of this supply should be examined before its use is permitted. As an illustration: The concrete in a certain culvert failed to set. At first the cement was blamed. Investigation brought out the fact that other culverts in the vicinity had been constructed with the same cement, sand and stone and were perfectly satisfactory. Attention was then given to the water. This water was taken from the creek flowing through the culvert; and when this creek was followed it was found that it flowed past a medicinal laboratory where bark and herbs were largely used. The creek was decidedly affected by the waste from this laboratory. This point well illustrates the effect of organic matter on water and concrete.

Any source of supply that gives very roilly water should not be used while it is in this condition. It is possible to allow the suspended matter to settle, the water may thus be satisfactory. Water that is brackish, or leaves any deposit in the nature of a slime, should not be used.

There are certain conditions in the use of concrete that are interesting and deserve consideration, but they do not really come under the head of this article. However, the question of placing concrete during freezing weather is an important one and, in conclusion, a moment or two may be spared with profit in its discussion. Every one admits that it is better not to do so, but conditions sometimes necessitate doing concrete work in the winter months. If the concrete is not subjected to varying temperatures, that is, if the concrete could be frozen and kept frozen until the winter was over, it could be placed at any time. But in this section of the country we have very variable weather, and since it is not possible to put our concrete in cold storage, we have only the alternatives of not putting it in at all or protecting it against the action of frost. But, as has been said, necessity sometimes demands that the concrete shall be put in. To lessen the harmful influence of the frost, several methods are followed. When the concrete is not to be a decorative feature there is nothing much better than the use of salt. Calcium chloride has also been used in the same way. When it is wished to avoid any possible efflorescence due to the salt, the [illegible] heated before being used. This latter method becomes effective only when the concrete is protected from the frost until it has acquired a set and has hardened considerably.

Experimental Road Work at Brandon, Man.

The City of Brandon, Man., has been experimenting with a new steam roller on Eighth Street, making roads from the crushed granite, manufactured by the city's crushing plant. The idea is to put to test the durability of macadam pavement. The exact length of the experimental stretch is [illegible] feet, with an average width of 39 feet, or a total of 2,253 square yards. The material used in its construction was 660 cubic yards of Nos. 2 and 3 granite, at $1.80, totalling $1,188; 93 cubic yards of No. 1 granite at $3.[illegible] [illegible] labor, $301.02; use of road roller, $21.00, a total cost for the entire piece of work of $1,81[illegible]. The pavement has an average thickness of 11 inches, an dhas been constructed at a cost of 80½ cents per square yard.

Building up the C. N. A. B.

President Nesbitt's Successful Tour of Western Canada Encouraging Evidences of Support from Leading Cities

A meeting of the Winnipeg Builders' Exchange was addressed recently by Messrs. Nesbitt and Lauer, of the Canadian National Association Association of Builders. Mr. H. J. Carter, president of the local exchange, was in the chair. Mr. Nesbitt complimented the Winnipeg builders upon their influential organization and alluded to his aim to consolidate the interests of the builders so that they might have a body similar to the Manufacturers' Association. The speaker pointed out a number of clauses in the statute books which he considered unjust to the builder. He also dealt at some length with the need for a better system of technical education.

Mr. Lauer referred to his dealings with the Minister of Labor, Hon. R. Lemieux, to whom he had pointed out how extraordinary it was that in the Disputes Bill, of 1907, which deals with railways and other industries, the building trade is not included, although the industry represents about ninety million dollars. The speaker also outlined what it would mean to have compulsory arbitration. In view of the recent lockout at Winnipeg this reference was particularly interesting.

Regina Builders' Exchange

The Builders' Exchange held a noteworthy banquet on the 30th ult. Mr. E. H. Nesbitt, of Quebec, president of the Canadian National Association of Builders, and Mr. J. H. Lauer, of Montreal, secretary of the Association, were the guests of the evening.

Ald. R. A. Brocklebank, president of the local exchange, spoke of what had been accomplished since the body had been organized in March last. The membership of the Exchange is now 65. It is well supported and is very optimistic concerning the future. Messrs. E. N. Butler and Jas. MacDonald responded to the toast of "The Architects." Mr. MacDonald is first vice-president of the Alberta Architectural Union.

Mr. E. H. Nesbitt, of Quebec, replying to the toast of "The Builders' Exchanges," emphasized the need for a strong national association and spoke of his desire to see the Calgary exchange affiliated with the C.N.A.B. The membership of the last named institution is at present 1,600, made up of members of the exchanges of six of the largest cities in Canada. Mr. Nesbitt said that it was essential to the interests of the Dominion to bridge the gap between the east and the west. Touching upon the value of organization, he pointed out how the labor body had succeeded in obtaining legislation, and this with practically no opposition from the builders.

Calgary Builders' Exchange

President E. T. Nesbitt and Secretary J. H. Lauer, Montreal, of the Canadian National Association of Builders, were tendered a reception by the Builders' Exchange, of Regina, Sask., upon their recent visit to that city. The subject impressed upon the Regina contractors was the value of a Dominion-wide organization for the master builders. It was arranged to hold a meeting of the exchange to discuss the matter of affiliating with the National Association.

The Civic Improvement Committee of Toronto have appointed a special Plan Committee, the work of which is defined as follows: "It shall be the function of this committee to prepare a comprehensive and general plan for the city and to take into consideration the surrounding district within a reasonable distance. The general scheme will have to do with such matter as street or other traffic, parks, boulevards, driveways, squares, play grounds and public buildings. Special attention should be given to the proper laying out and treatment of the area lately brought within the city limits." The members of this committee are Alderman Chisholm, Controllers Spence and Ward, and four well known city architects, Messrs. Burke, Hynes, Langton and Lyle.

A farmer of Lloydminster, Sask., has a barn, probably the most remarkable in the world. It was built about a year ago. He recently discovered that willows which had been used for corner posts and walls, were growing, and that the floor had risen three feet. A year ago last spring the barn was on stilts nine feet high; and he put in another floor, converting it into a two-storey building. The new floor is already a foot above ground, and the farmer is looking forward to when more storeys may be added.

The death occured last week of Mr. Daniel J. O'Leary, contractor, of Montreal, father of Mr. Jno. O'Leary prominent also in Montreal contracting circles.

Constructional Notes

Work on the provincial parliament buildings at Regina, Sask., has been somewhat delayed by the strike of the Lyall-Mitchell Company's bricklayers. At the present time, however, the company is pushing ahead with characteristic enterprise, and it is expected that the buildings will be far enough advanced to house the legislature at the opening of the next session.

The City of Brandon, Man., is now in possession of a central heating plant, which has been installed by the Brandon Electric Light Company. A test of the system made last week was entirely satisfactory. About a dozen of the largest buildings in the city have been connected with the new system, which it is stated will mean both economy and the lessoning of the fire risk.

Over eight miles of new water mains, costing in the neighborhood of $100,000, have been laid in Calgary the past year, making a new record in the history of the city. This has necessitated extensions of the sewer system as well, and as a result over ten miles of sewers have been laid. The west end of the city has been attacked during the past eight months, and its water difficulties solved. In the course of a few weeks a start will be made on Bridgeland, Riverside and East Calgary extensions. It is possible, the sewer system will be pushed into Sunnyside and Hillhurst this fall or during the early part of the winter. Preparations are being made to construct the trunk sewer north of the Bow river, which will serve these districts as soon as the low water comes.

Mr. Duncan McArthur, who has the contract for the big irrigation canal at Medicine Hat, was in Winnipeg last week. He stated that it would be at least another year before the water can be turned in through the main ditch. One of the cuts on this piece of work is the largest of its kind ever undertaken in Canada. It runs for a mile and three-quarters through a hill which in places is 65 feet in depth. Bebore the work is done it will be necessary to remove at least a million and a half cubic yards of earth. At the present time there are three two-and-a-half yard steam shovels in operation, but rapid progress is not possible. However, from two or four thousand cubic yards a day are being taken out. The shovels will probably be kept at work for some time after the freeze-up.

Messrs. Quinlan & Robertson, of Montreal, are stated to be making good progress on the aqueduct construction in that city. Over three hundred men are on the job, and, according to a statement submitted on October 1, by Mr. Janin, superintendent of the waterworks, 409,358 cubic yards of earth have been removed. This represents about one-quarter of the contract. Messrs. Quinlan & Robertson have three years to complete the work. A large portion of the excavated material will be used by the town of Verdun in the erection of a flood dyke. The water consumed in the city is now conveyed to the pumps by the large concrete-covered conduit, eight feet in diameter, which runs underground from Lachine to Point St. Charles. It was the completion of this conduit a year ago which enabled the city to draw off the water from the aqueduct and begin the widening and deepening of it.

News of Conventions

A meeting of the Ottawa branch of the Canadian Society of Civil Engineers will be held at 177 Sparks Street, Ottawa, on Oct. 12. Mr. S. J. Chapleau, of the Department of Public Works, is secretary of the branch.

The annual convention of the American Railway Bridge & Building Association will be held at Denver, Colorado, Oct. 18-20. For particulars address the secretary, Mr. C. A. Lichty, Chicago & Northwestern Railway, Chicago, Ill.

The annual convention of the British Columbia Union of Municipalities will be held at Salmon Arm, B.C., in November. The actual date will be announced later. Mr. Bell, Mayor of Vancouver, is president of the Union, and Mayor Planta, of Nanaimo, B.C., vice-president.

Mr. A. A. Dion presided last week at the annual meeting of the Ottawa branch of the Civil Engineers, and the following officers were elected: A. H. Dion, president; H. Victor Brayley, secretary; committee, S. J. Chapleau, John B. McRae, Gordon Grant, James White and J. E. N. Cauchon. The reports of the various officers were most satisfactory.

City Engineer Rust, of Toronto, left the city last week-end to attend the annual convention of the American Society of Municipal Improvements, which is being held at Erie, Pa., Oct. 11-14. Among the papers which are scheduled for this meeting is one entitled, "European Sewage Disposal Works," by Mr. Rudolph Hering, the well-known New York consulting engineer. Of the special committees that will submit reports, Mr. Alcide Chausse, city architect and superintendent of building at Montreal, is chairman of the Fire Protection Committee, and Mr. C. H. Rust, of Toronto, chairman of the committee appointed to consider standard specifications.

At Winnipeg last week a deputation waited upon the Hon. R. Rogers, Minister of Public Works for Manitoba, to discuss the interests of the good roads movement. The Good Roads Association recommend that the government guarantee bonds of municipalities for good roads projects. The deputation was referred to Mr. MacGillivray, good roads commissioner, and it is understood that the matter will come before the Good Roads Association and that a report will be prepared and submitted to the meeting in November of the Manitoba Union of Municipalities. The members of the deputation were: S. R. Henderson, Reeve of Kildonan; Geo. T. Chapman, Reeve of Assiniboia; John Hebblen, Reeve of Rosser; J. M. Smith, Reeve of St. Paul, and I. W. Smith, Reeve of Springfield.

Canadian Railroad Development

Mr. G. G. S. Lindsey, of Toronto, is now at Victoria, B.C., after a northern trip. He says that G. T. P. steel will be laid within two miles of Kitselas Canyon before the end of the present month. Construction camps are well filled, and the men are working on toward Hazelton and Aldermere.

It is believed that the Dominion Government will eventually decide upon Port Nelson as the terminus of the Hudson Bay Railway. Thomas Turnbull, formerly Chief Engineer of the Canadian Northern and now under the employ of the Government, has been over the proposed route and spent considerable time looking over the vicinity of Port Nelson.

Mr. C. O. Foss, resident engineer, who has returned to St. John, N.B., from a trip of inspection over the Transcontinental road in New Brunswick, states that No. 1 section will be ready for acceptance by the end of the month. The section on contract, No. 2, is now ready for operation, but details will not be completed until the end of the season. Contract No. 3 is ready to be taken over any time. The subcontractors on section No. 4 say that they will be ready this fall. Taken as a whole the line is rapidly nearing completion, and before the end of next season it will be ready for operation from one end to the other.

The Pincher Creek, Cardson & Montana Railway, will apply at the coming session of the Alberta legislature for an extension of the charter, which will permit it to construct the main line through Alberta by way of Calgary and Edmonton, into the Peace River country. There will also be a branch into the Kootenay to tap the coal fields which it is understood the company has secured. Construction has already commenced on the first 100 miles north of the international boundary. Surveys of this portion of the line are nearly completed, and $3,000 per month has been spent on surveys during the summer. Construction will also be commenced north toward Calgary and Edmonton this fall.

It is believed in Vancouver, B. C., that it is now almost a certainty that the proposed branch of the Grand Trunk Pacific between Fort George and Vancouver will traverse the Lillooet District and strike the Canadian Pacific at or near Agassiz Station. The trial lines run this season from Lillooet on the Fraser to Lytton, where the river is joined by the South Thompson River, are not considered satisfactory, owing to the heavy rock work and the enormous cost involved in construction. An engineering party is now working north from Agassiz. Its objective is Lillooet. It is aimed as a route where very low grades can be secured all the way from Lillooet on the Fraser to Agassiz, whence the line will parallel the Canadian Pacific into Vancouver.

Personal Mention

Messrs. Storey & Van Egmond, architects, of Regina, Sask., were successful in the competition for plans for a new Carnegie library for that city. Mr. F. C. Clemesha, of Regina, was awarded second place.

Mr. Geo. E. Mills, contractor for the masonry and brick work at the registry office at Hamilton, Ont., sustained a compound fracture of the leg last week. The accident was caused by the falling of a large iron gate.

Mr. Tracy LeMay, O.L.S., has been appointed City Surveyor for Toronto at a commencing salary of $1,500. The appointment is made to fill the vacancy caused by the resignation of Mr. Chas. Unwin, who is 81 years old.

Messrs. Nobbs & Hyde, 157 St. James Street, Montreal, are carrying on business under the above style. The partners are Mr. Percy E. Nobbs, F.R.I.B.A., and Mr. Geo. T. Hyde, B.Sc. Professor Nobbs is well known to the profession by reason of his connection with McGill University.

Mr. Chas. McDonald, of Gananoque, has been appointed to the Quebec Bridge Commission to fill the vacancy caused by the resignation of Mr. Fitzmaurice, of London, Eng. Mr. McDonald is a practical bridge engineer of excellent experience. For years he was head of the American Bridge Company, one of the largest bridge building firms in the United States. He has been living retired at Gananoque for some time.

Mr. R. F. [illegible], city bridge engineer of Toronto, is stated to have been offered a lucrative position, the acceptance of which will mean his leaving the city. He is doing excellent work at Toronto and is very popular at the City Hall. He understood that, in any case, he will remain until the completion of the Don bridge, now under construction.

Mayor Hopewell, Controller Davidson and Alderman Caron and Brown, of Ottawa, have been appointed by the city council to act with the sub-committee of the Ottawa Improvement Commission in planning for the future extension and improvement of the city. They will confer with Mr. Vivian, the old country expert, who will be in Ottawa at an early date.

Building Returns for September

Winnipeg building permits for September represent a total of $266,475, an increase of 46 per cent. over the same month last year.

The total value of building permits issued last month at London, Ont., was $141,623, compared with $54,890 for September, 1909.

The Montreal building inspector's record shows that for the nine months ending September 30, permits authorizing the construction of buildings valued at $11,205,000 have been issued. The figure is practically double that of 1909, during the same months.

Building permits issued at Regina, Sask., during September represented a value of $209,750, as compared with $53,300 for the corresponding month of last year. For the nine months of 1909 and 1910 the figures were respectively $639,834 and $2,032,448. The city will easily make a record year. The prospects for 1911 could not be brighter.

The September building total for Hamilton, Ont., was $266,475, an increase of $84,525, or 46½ per cent. over the corresponding month of last year. A local paper, which is particularly enthusiastic over the city's ambitions, points out the fact that in September, 1900, the permits issued were valued at $42,800, thus giving last month an increase in ten years of over 500 per cent.

It is anticipated that the aggregate value of the building permits issued during the current year at Victoria, B. C., will reach the two million mark, and thus constitute a new record in the history of the city. For the first nine months of the year the permits issued totalled $1,837,625, compared with $1,443,295 for the corresponding period during September totalled $190,686, compared with $140,935 last year. For the nine months the total number of permits issued was 583, as compared with 456 a year ago.

The Canadian Department of Public Works, Ottawa, is preparing a special report on the storage of waters on the upper Ottawa river by means of dams at Kippewa and Temiskaming. It will show the general effect of such work in the regulation of the flow of the river, the intention being to conserve high water for seasons of the year when the river is low. An important feature of the report, however, will emphasize the claim that the works in progress and those to be undertaken will be of greater utility when the Georgian Bay canal is constructed. This consideration enters largely into the plans.

An Economical Bridge Contract

An example of economical erection of light trusses is afforded by the highway bridge at Russell, Mass., which crosses the Westfield River with two 125-foot lattice girder spans, weighing about 70 tons each, and supported at a height of about 25 feet above the water on two masonry abutments and a centre pier. The bridge was planned to carry the roadway over the tracks of the Boston & Albany Railroad on the south side, where there are two plate girder spans. The old bridge across the river was carried away by a freshet, and in order to provide ample clearance from high water, the consulting engineer, dropped the floor about 6 feet below the upper chord of the truss, making a half-through bridge with diagonal cross bracing from the floor beam to the lower chord.

The material was unloaded from cars and lifted some 10 feet to the level of the lower chord by a steel jinnywink derrick and 40-foot, 7-ton steel boom, operated by hoist engine. Light falsework, with two-post bents was set up by hand for part of the span and the unloading derrick then erected enough of the end of the truss to form a platform at the roadway level. On this platform a few planks were thrown across the first panel of stringers and at this level a second steel jinnywink derrick was set up. This derrick, operated by the same engine, was moved forward by hand, setting the falsework bents ahead and the steel work and floor system as it moved along.

The material was loaded on a light push car by the first jinnywink derrick and run out on the falsework at the level of the lower chord, the cross-bracing underneath the floor beams being temporarily omitted to allow ample room for handling the long pieces. As soon as the derrick had completed the erection of the first span, three gangs drove the rivets of the main members with pneumatic hammers, and the bridge was swung off. The falsework was removed and was re-erected for the second span, which was assembled in the same manner. The work was done with a force of about 20 men, who also laid the wood floor and did the painting in about six weeks.

The ex-Prime Minister of England, Right Hon. Arthur James Balfour, is bringing action against the contractors for the construction of the Grain Exchange for injury to his building, the Balfour Block, on Rorie Street, which adjoins the Grain Exchange.

We Manufacture

HOUSE TRIM Pine and Hardwood

Special attention given to

Chestnut Trim

Estimates promptly given for quick and good work

The Tillson Co., Limited
Tillsonburg, Ont.

Tenders

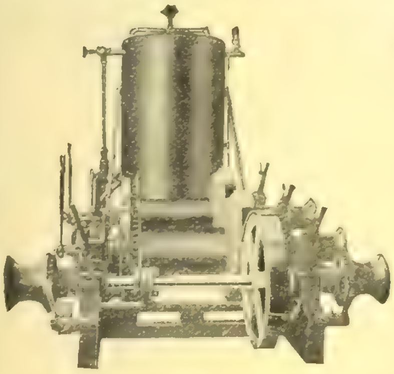
A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Special

Structural Steel Hoist



Designed for erecting Bridges, Office Building, and all other structures of steel.

All four spools work independently, so four lines may be handled separately, while the drums are operating the derrick. Will also propel its own car if required.

Used by the largest Bridge Building Concerns in Canada

Let us send you our catalogue and prices on that Hoisting Engine you are needing.

Marsh & Henthorn, Limited

Sales Agents:
Mussens Limited, Montreal, Que.

Belleville, Ont.

"The durability of a building is the gauge of its value from an economic standpoint."

—The Philosopher of Metal Town.

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality OLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1955

The Metallic Roofing Co Limited

TORONTO & WINNIPEG

SCANDINAVIA BELTING

For Conveying and Transmission

Whether your Belt Drive is **straight** or **crossed**, conditions **wet** or **dry**, of the air dust laden **Scandinavia Belt** will give you satisfaction.

We can save you money.

Write for Bulletin "A" and discounts.

Federal Engineering & Supplies, Limited

284 Yonge St.
TORONTO

AGENTS: Power Economies Limited, Montreal | McDougall Hardware Co., Ottawa | Agents Wanted in other Cities
Marks-Clavet-Dobie Limited, Port Arthur | Great West Saddlery Co., Calgary

Sackville Freestone Co.
Sackville, N. B.

Block Stone Shoddy
Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Get our prices on our
CONCRETE REINFORCEMENT
Continuous lengths or in sheets cut to size
WINDOW GUARDS
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone
can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known

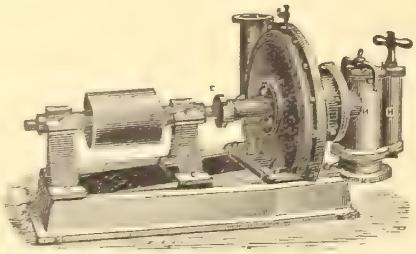
TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

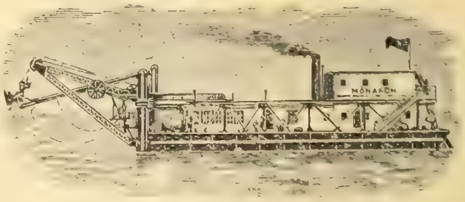
Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada
Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

WE HAVE THE STOCK

ready for prompt shipment

Fire Clay
Fire Brick

Cement
Crushed Stone

Building Stone
Building Sand

Gravel, Screened, Pit Run and Pea Gravel

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 / 665 Evenings, North { 2107 / 658

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co. Limited

Campbellford, Ont.

Bridge over Spanish River at Massey, Ont.

**Steel Bridges, Steel Buildings
Roof Trusses**

and other Structural Steel

Foundry and Machine Shop in connection.

Estimates on application

The Calkins Tile & Mosaic Co., Limited

458 Bleury Street,
Montreal

Tiles
Mosaics
Ceramics
Quarries
Marbles

We handle all classes of work from the largest contracts to the smallest requirements of the marble and Tile trade. Write us for prices.

Save from 25% to 50% of Steel
by using the

"Burrowes" Patented System of Reinforcement for Concrete

A perfect reinforcement for beams, girders, slabs, arches, retaining walls, culverts, circular conduits, concrete poles for power and telegraph lines, and every kind of concrete construction.

We will supply reinforcement fabricated, or will [illegible] For further information apply to

SIDNEY BURROWES, Niagara Falls Centre, Ont.

Canadian Patent No. [illegible] Patented also in Great Britain and U. S. A.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK IVORY CEMENT PLASTER

—Yards—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

THE MILTON PRESSED BRICK CO.
LIMITED

Why You Should Specify Milton Pressed Brick

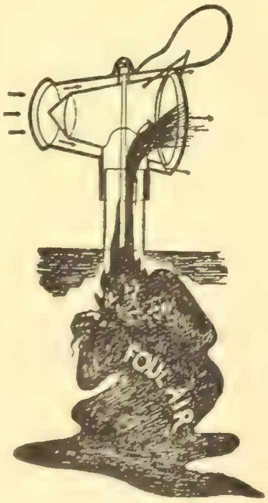
For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

AUTOFORCE VENTILATING SYSTEM



Patented
Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

Handsome Ornamental Work

Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE
CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read **The Cement Era.** The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.
1800 Monadnock Block - - CHICAGO

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper, but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal. Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS {
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phones: Office 1217
Yard 4507

Sand & Supplies, Ltd.

TORONTO

Are You Interested in Good Brick?

Do you want to be known as a fellow who always uses the best? Then in future see that you specify

"Port Credit" Brick

It's strong, durable and has a rich red color that will please you beyond all expectations.

We are armed for Fall Orders

Port Credit Brick Co.
Limited

Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert Pipes

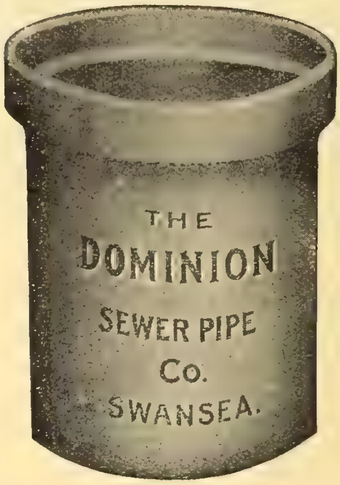
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

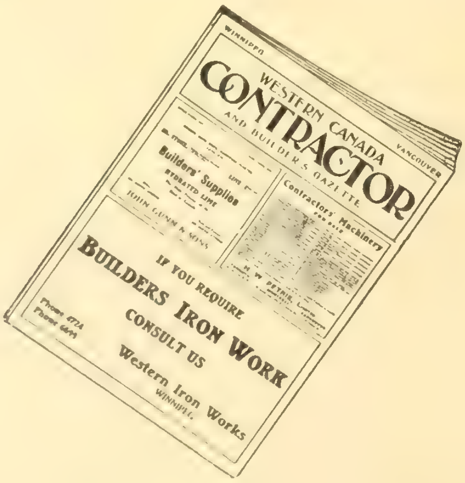
also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDERS GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

Largest Manufacturers of

Vitrified Salt Glazed
Sewer Pipe
Standard and Double Strength

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW,
President.

R. H. NEW,
Vice-President.

It Pays To Pay For Quality

After 50 years in business we are thoroughly convinced that the Engineers, Contractors and dealers throughout Canada are united in their opinion on this question.

HAMILTON
Salt Glazed Vitrified
Sewer Pipe

is the hightest quality of Sewer Pipe sold in Canada.

Combined with quality we pay special attention to delivery, our prices are always within the market.

In every district throughout Canada we have Customers who will gladly verify these statements.

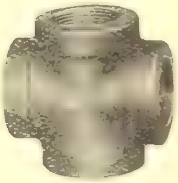
ARE YOU CONCINCED?

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

These are Right

ELBOW

TEE



CROSS

IF THERE IS AN
S ON THEM **S**

We manufacture and stock a full line of Screwed and Flanged Cast Iron Fittings.

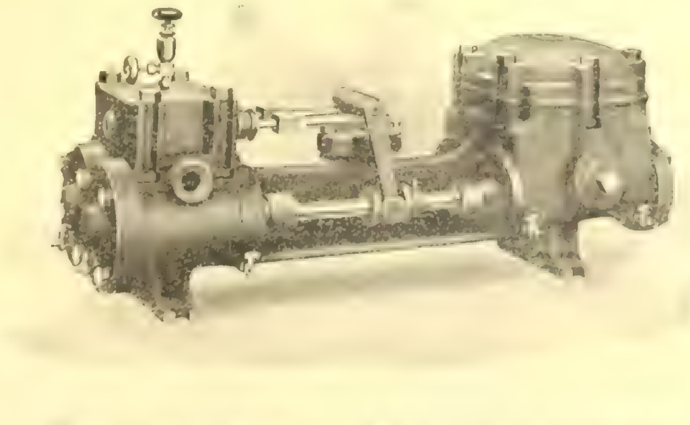
Send for a Catalog

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

Duplex Steam Boiler Feed Pumps

In design and construction, our new Standard Duplex Pumps conform to the latest and most approved practice, and in addition include a number of special features of merit described in our Bulletin No. 36. :: ::

**Full Stroke
under all
conditions.**



**Reliable in
Service.**

**Compact in
Design.**

Canada Foundry Company, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

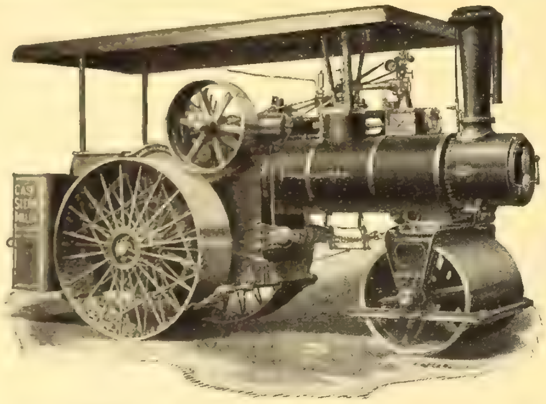
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

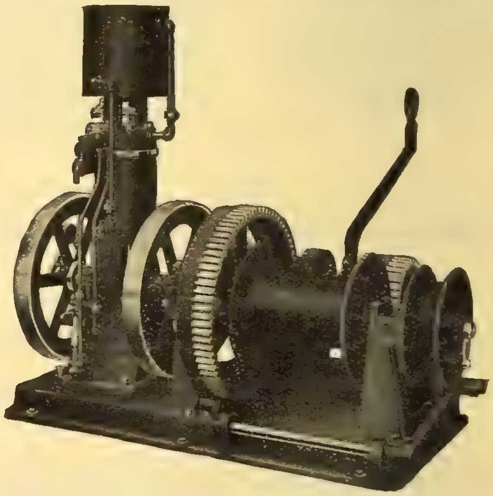
Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.
Hamilton, Ont.

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co.

Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St John, N.B. Winnipeg Calgary Vancouver
Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Established 1882

THE COMMERCIAL

A weekly financial, commercial & general trade newspaper of the Great West.

Winnipeg Manitoba

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C. E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The Laurentian Granite Co. Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal
Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work ... $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ... $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to colo., 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe.

Lead pipe, 30 per cent off, lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

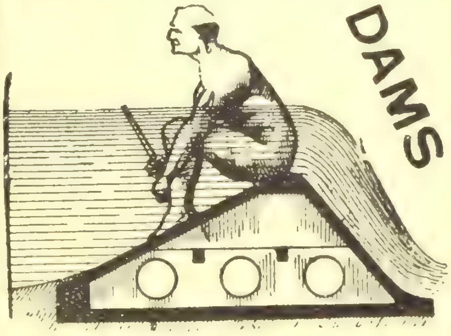
Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

VALUABLE SWING HOIST.

The Sasgen Circle Swing Hoisting machine is proving very popular among the contractors, there being over 1,000 contractors who are using from one to six of these machines, including a number in the Twin Cities. There is also a cement drain tile machine that works by hand and costs [illegible] that is claimed will turn out as many tile as power machines costing from $1,000 to $2,000 each. Nels Erickson, 406 Boston blk., Minneapolis, is agent for both these machines and will demonstrate their good points upon request.

The B. C. Gazette gives notice of the incorporation of the following companies: The Canadian Home Builders, Limited, capital $1,000,000; Canadian Mills & Timber, Limited, capital $1,000,000; Lincoln Sawmills Company, Limited, capital $50,000; Electric Railways Construction Company, Limited, capital $600,000; Notch Hill Builders' Supply Company, Limited, capital $75,000; the Vancouver Sewer Pipe and Refractories Company, Limited, capital $250,000; the Bridges Lumber Company, Limited, capital $125,000.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
The KATIE Foundry,
Galt, Ont.
Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor   Entire building of Alsen's Cement, Reinforced Concrete

Alsen's Cement

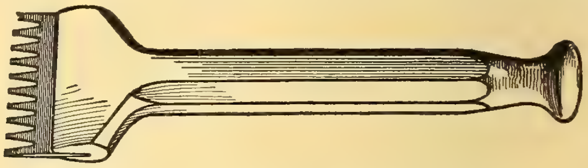
was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.



The
"Simplex" Stone and Marble Cutter

Does away with sharpening of tools. When the teeth are worn replace with a new blade. The new blades are cheaper than sharpening, and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

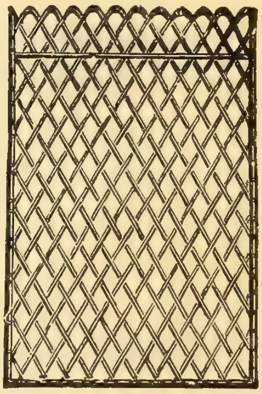
Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

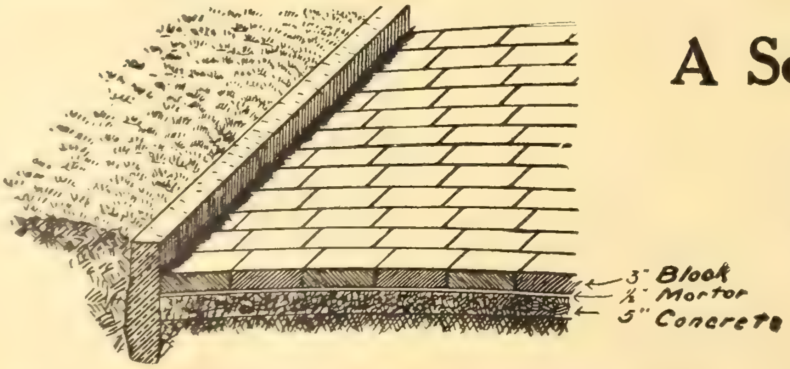
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement
must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by
Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

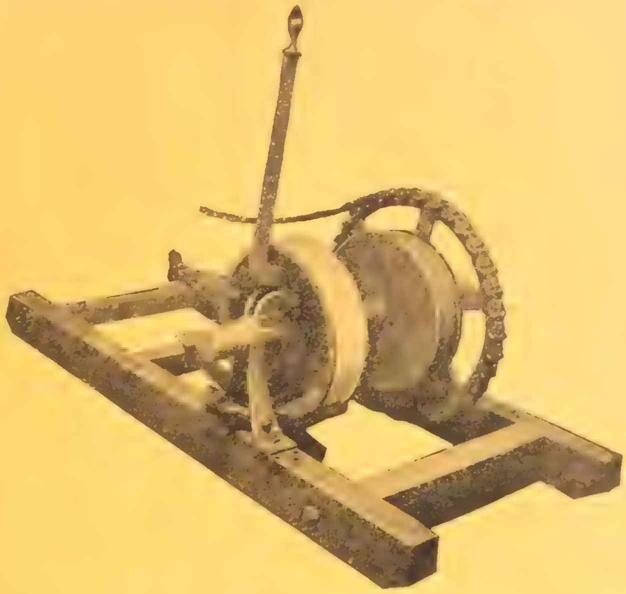
All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

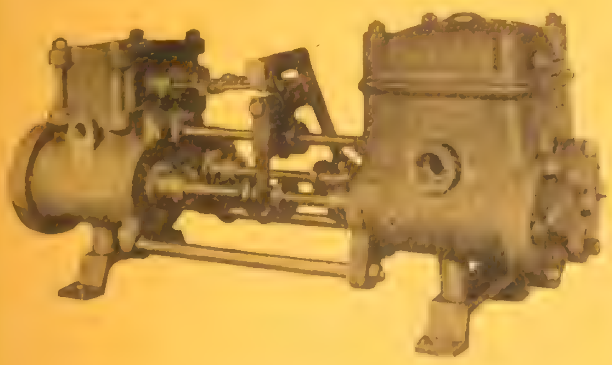
Contractor's Work — Mortar Conveying — Well Digging
Bridge Building — Sewer Building — Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists
London, Canada

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

WIRE ROPE

When you require Wire Rope for any purpose, it will most certainly pay you to communicate with us. We carry the largest stock in Canada and can give you immediate shipment of almost any length in any size for every requirement.

We make a specialty of High Grade Dredge and Steam Shovel Cables and also make Wire Ropes to suit any special requirement.

Every rope is made from the best quality of imported wire, specially drawn to our own specification, and no expense is saved to carefully test each coil for its tensile strength, torsion, flexion and elastic limit.

Wire Ropes for hoisting, elevators, guys, semaphores, bridges, towing, haulage, transmission, etc., always in stock.

Let Us Quote You

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

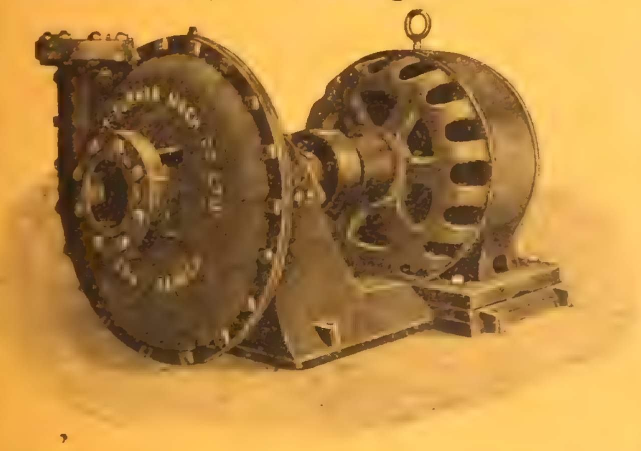
Vol. 24 Toronto, October 19, 1910 No. 42

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.



The Smart-Turner Machine Company
HAMILTON, CANADA Limited

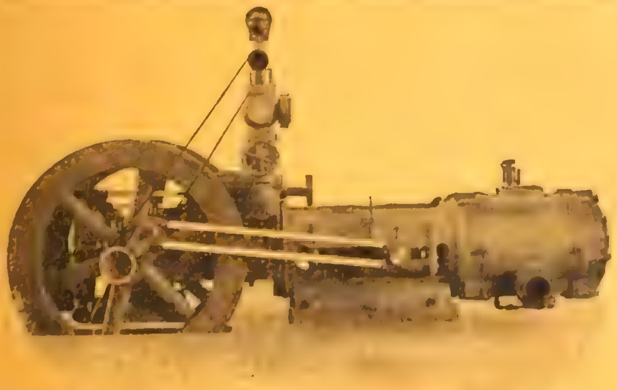
"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

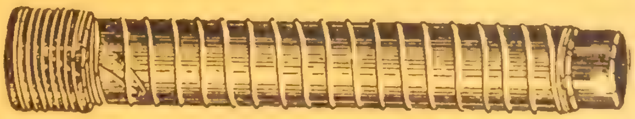


CLASS "C" STRAIGHT LINE STEAM DRIVEN AIR COMPRESSORS

Large Air Capacity—Efficient Regulation
Large Bearings—Rigid Construction

Ask for Descriptive Catalog K 84

CANADIAN RAND CO., Limited
Commercial Union Building, MONTREAL, QUE.
Toronto Halifax Winnipeg Vancouver Rossland Cobalt



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend **"Luxfer-Prisms"** every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page
Canada Wire Goods Mfg. Co 56
Dennis Wire & Iron Works 10

Belting
Federal Engineering & Supplies, Ltd 55

Boilers
Inglis, John 24
Jenckes Machine Co 2
Leonard & Sons, E 63
Marsh & Henthorn 55
McDougall Caledonian Iron Works 33
Mussens Limited 34
Taylor-Forbes Co 5
Waterous Engine Works Co. ....

Brick
American Enamelled Brick Co. ....
Canadian Pressed Brick Co. 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co ....
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co. ....

Bridges (Steel)
Canadian Bridge Co 18
Cleveland Bridge Co. 18
Dickson Bridge Works ....
Dominion Bridge Co 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware
Taylor-Forbes Co 5

Cement
Alsen Portland Cement Co. 16
Britnell & Co 57
Bremner, Alex. 63
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 64
Rogers, Alfred 4
Rogers Supply Co 33
Sand and Supplies 59

Conduits Page
Conduits Co., Limited 57

Concrete Mixers and Machinery
Canada Foundry Co 61
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F., H. 68
Jenckes Machine Co 2
London Concrete Machinery Co. 23
Mussens Limited 34
Morrison & Co., T. A. 64
Rogers Supply Co 33

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 65
Buffalo Steel Co 19
Canada Wire Goods Mfg. Co. 56
Hamilton Iron & Steel Co. ....
Trussed Concrete Steel Co. 13
Wells & Gray 8

Contractors' Plant
Beatty & Sons, M. 56
Factory Products Limited ....
Hepburn, John T. 17
H. & E. Lifting Jack Co. ....
Hopkins & Co., F. H. 68
Katie Foundry Co 65
Marsh & Henthorn 55
Mussens Limited 34

Crushers (Stone and Rock)
Hopkins & Co., F. H. 68
Jenckes Machine Co 2
Mussens Limited 34
Morrison & Co., T. A. 64

Corrugated Iron
Galt Art Metal Co ....
Metallic Roofing Co 55
Metal Shingle and Siding Co. 20
Ormsby, A. B., Limited 5
Roofers Supply Co 63

Contractors Page
McIlwraith, Jas. A. 64

Drills
Beatty & Sons, M 56
Canadian Rand Co 1

Deafening Felts
Cabot, Samuel, Inc. 59

Drilling Contractors
Harvey, J. 65

Dredges
Beatty & Sons, M 56

Engines
Canadian Boving Co. ....
Inglis, John 24
Jenckes Machine Co. 2
Leonard & Sons, E 63
Mussens Limited 34
Waterous Engine Works Co. ....

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Factory Products Limited ....
Northern Electric & Mfg. Co. 36

Engineers (Civil and Mechanical
Barber & Young 64
Chipman & Power 64
Bowman & Connor 64
Farmer, John T. 64
Fuce, Edw. O. 64
Galt Engineering Co., John 64
Glaubitz, H. J. 64
Hunt & Co., Robt. W. 59
Inglis, John 24
Kennedy, Jas. C. 64
Lea & Ferguson 64
Mace, T. Harry 64
Mitchell, C. H. 64
McRae, John B. 64
Moore & Scollan 64
Nadel & Adler 64

Fire Apparatus Page
Factory Products Limited ....
Morrison & Co., T. A. 64
Seagrave, W. E. 16

Fireproof Doors and Windows
Douglas Bros. 14
Mussens Limited 34
Ormsby, A. B. 5

Granite and Marble
Laurentian Granite Co. 64
Missisquoi Marble Co. ....
Rogers Supply Co. 33
Smith Marble & Construction Co. ..

Glass
Chance Brothers & Co. 12
Consolidated Plate Glass Co. 61
Luxfer Prism Co. 2
Thompson & Co., B. & S. H. 12
Toronto Plate Glass Importing Co. .. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 63
Tavlor-Forbes Co. 5

Hoisting Machinery
Beatty & Sons, M. 56
Factory Products Limited ....
Inglis, John 24
Jenckes Machine Co. 2
Hopkins & Co., F. H. 68
Marsh & Henthorn 55
Mussens Limited 34
Scott Machine Co. 61

Hydrants
Canada Iron Corporation 63
Gartshore-Thomson Pipe Co. 62
Kerr Engine Co. ....

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

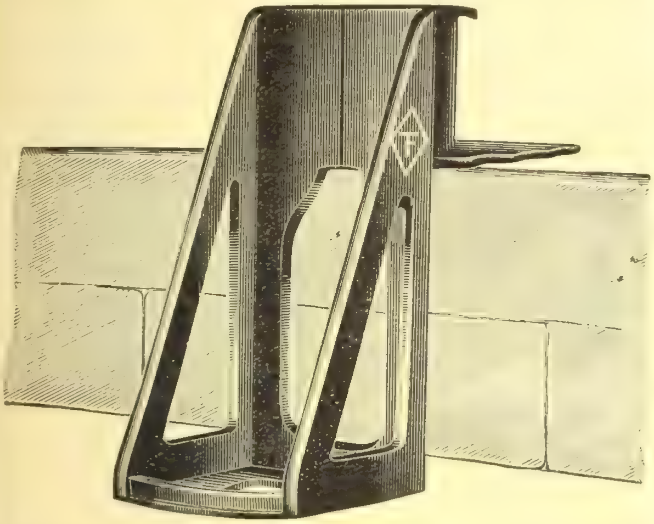
Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 **28 King Street West, TORONTO**

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

These are Right

ELBOW

TEE

CROSS

IF THERE IS AN
S ON THEM **S**

We manufacture and stock a full line of Screwed and Flanged Cast Iron Fittings.

Send for a Catalog

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

We have 50 Kalameined Clad Fireproof Doors in the Traders Bank Building, Toronto

They mean a **big reduction** in their **Insurance Rates.** They have **artistic,** as well as **Fireproof Doors,** something in keeping with the building.

Specify a Kalameined Clad Door that has this artistic appearance, that is the ORMSBY "UNDERWRITERS" made to any detail, and made without any bulging between the wood and the iron.

Let us give you an approximate figure

A. B. ORMSBY, Limited

Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish	Page
Batts Limited	10
De Laplante Ltd.	30
Eaton & Sons, J. R.	23
Georgian Bay Shook Mills	67
Rhodes Curry & Co	
Sanitary Floor Co.	60
Siemon Bros.	61
Tillson Co	57
Woodstock Lumber Co.	60

Metal Lath	
Galt Art Metal	
Metallic Roofing Co.	55
Noble C. W.	20

Meters	
Hopkins & Co., F. H.	68
Neptune Meter Co	56

Paving and Paving Materials	
Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	57
Ontario Asphalt Block Co.	66
Silica Barytic Stone Co., of Ontario	65

Plaster	
Albert Mfg. Co.	67
Britnell & Co	57

Pipe	
Canadian Pipe Co.	62
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	62
Municipal Construction Co.	16
National Iron Works	63
Pacific Coast Pipe Co.	1

Power Engines	
Inglis Co., John	24

Paints and Varnishes	
Cabot, Samuel, Inc.	59
Glidden Varnish Co.	36
Paterson Mfg. Co.	22

Pile Driving	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery	
Beatty & Sons, M.	56
Goulds Pump Co.	57
Hopkins & Co., F. H.	68
Inglis Co , John	24
Leonard & Sons, E	63
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	33
Mussens Limited	34
Ontario Wind Engine & Pump Co.	61
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials	
Barrett Mfg. Co.	22
Galt Art Metal Co.	
Metallic Roofing Co.	55
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	33
Roofers Supply Co.	63

Railway Supplies	
Factory Products Limited	
Gartshore, John J.	64
Hopkins & Co., F. H.	68
Mussens Limited	34

Road Machinery	
American Road Machinery Co.	10
Case Threshing Machine Co.	62
Climax Road Machine Co.	62
Morrison & Co., T. A.	64
Mussens Limited	34

Sewer Pipe	
American Sewer Pipe Co.	60
Britnell & Co	57
Canada Iron Corporation	63
Dominion Sewer Pipe Co.	60
Gartshore-Thomson Pipe Co.	62
Hamilton & Toronto Sewer Pipe Co.	61
National Iron Works	63
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	33
Standard Drain Pipe Co.	60

Sand	
Rogers Supply Co.	33
Sand & Supplies	59

Stone	Page
Britnell & Co.	57
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	57
Corinthian Stone Co.	56
Crushed Stone, Limited	58
Doolittle & Wilcox	63
Hagersville Contracting Co.	5
Laurentian Granite Co.	64
Maloney John	19
Morrison & Co., T. A.	64
Myers, Oakley	58
Rogers Supply Co.	33
Roman Stone Co	17
Sackville Freestone Co.	11
Sand and Supplies	59

Structural Iron and Steel	
Buffalo Steel Co.	19
Dominion Bridge Co.	18
Eastern Canada Steel Co.	15
Hamilton Iron & Steel Co.	
MacKinnon Holmes & Co.	
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	64
Reid & Brown	64
Salter, W. H.	19

Shovels (Steam)	
Beatty & Sons, M.	56
Hopkins & Co., F. H.	68
Mussens Limited	34

Shingle Stains	
Cabot, Samuel, Inc.	59

Slate	
Roofers Supply Co.	63

Steel Shingles and Ceilings	
Galt Art Metal Co.	

Smoke Stacks	
Leonard & Sons, E.	63

Safes and Vaults	page
Taylor, J & J	19

Stone Cutters	
Bailey-Underwood Co.	

Sheathing Papers	
Cabot, Samuel, Inc.	59

Telephone Supplies	
Northern Electric & Mfg Co.	36

Tiles	
Smith Marble & Construction Co.	

Tanks and Stand Pipes	
Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	63
Marsh & Henthorn	55
McDougall Caledonian Iron Works	33
Ontario Wind Engine & Pump Co.	19

Valves	
Canada Iron Corporation	63
Gartshore-Thomson Pipe Co.	62
Kerr Engine Co.	
Marsh & Co, Jas.	56
Standard Fitting & Valve Co	5

Ventilating System	
Gardiner & Gaskill	

Waterproofing for Cement and Brickwork	
Cabot, Samuel, Inc.	59

Wire Rope	
Dominion Wire Rope Co.	68
Greening Wire Co., B.	66
Smith, Thos. & Wm.	21

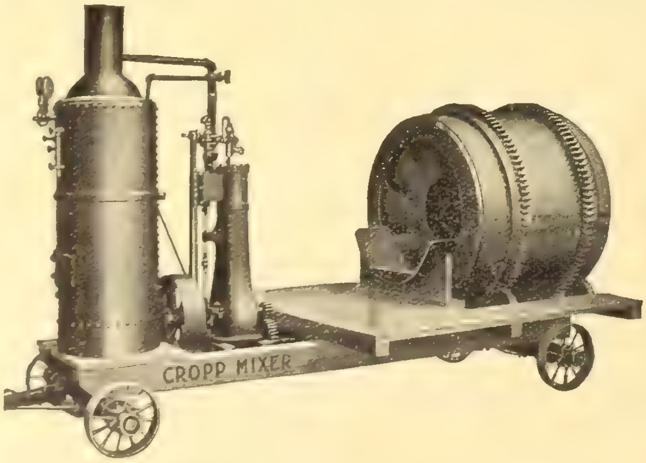
Wire Guards and Screens	
Canada Wire Goods Mfg. Co.	56

Water Wheels	
Canadian Boving Co.	

Wire and Cable	
Factory Products Limited	

The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

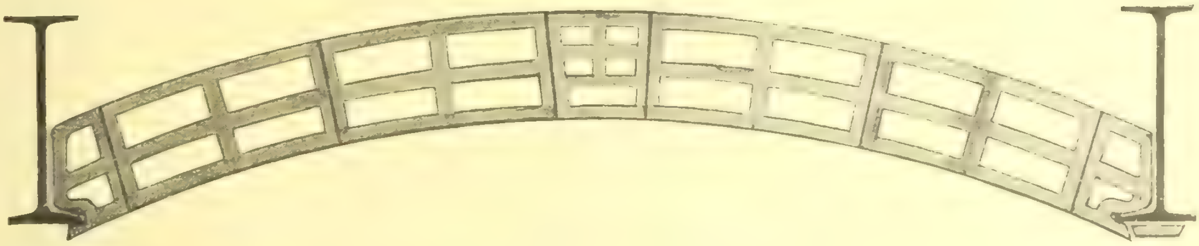
Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

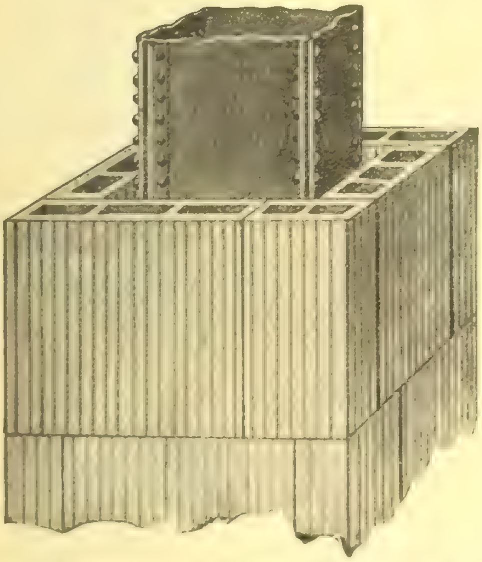
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

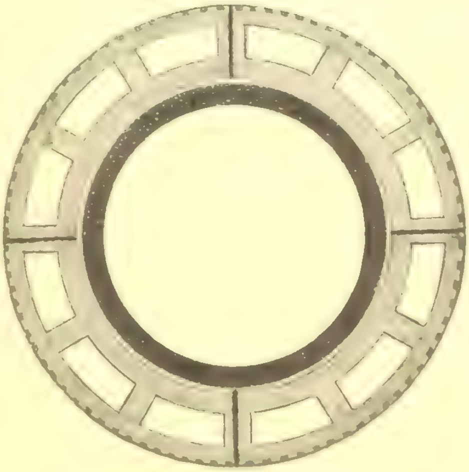


Section showing style of Skewbacks and Keys

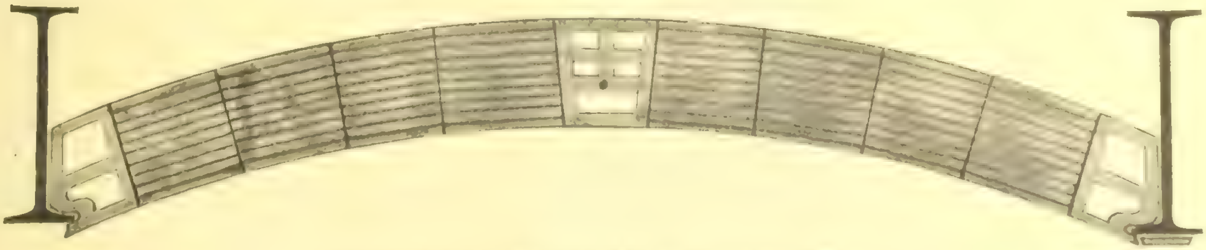


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



Section showing style of Skewbacks and Keys

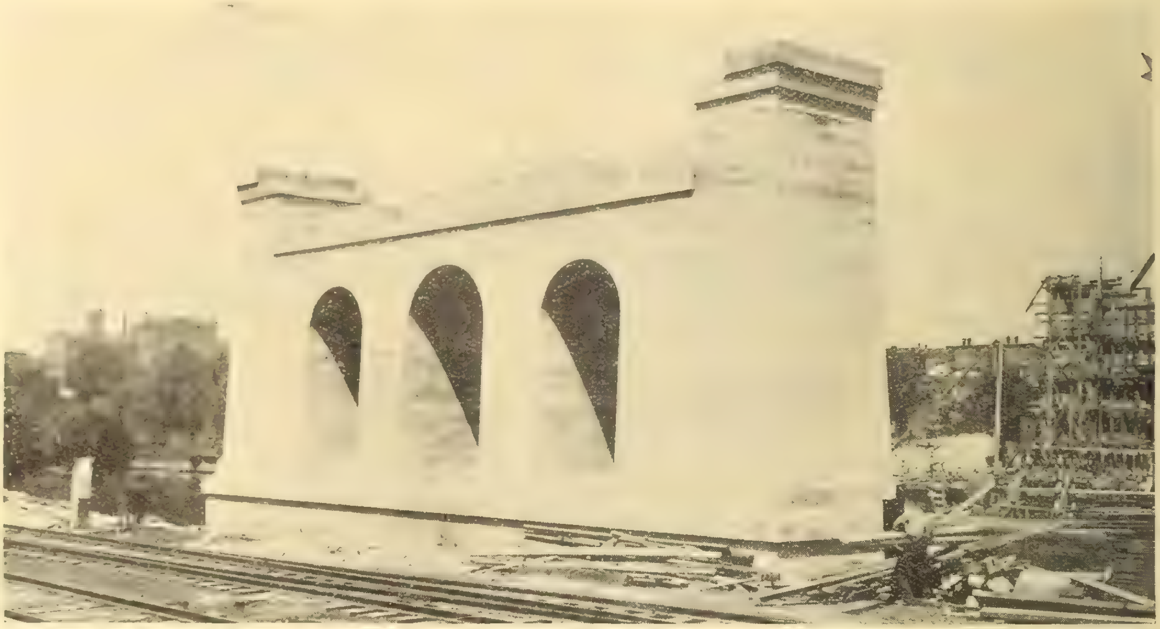
THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

The Wilton Ave. Bridge

described in this issue is one of the many contracts which we have carried through with satisfaction to all concerned



Detail of River Pier

Our references are the people for whom we have done work

The following is a list of work done this year:

Wilton Ave. Bridge, City Toronto.
Extensive improvements to plant, Gunns Ltd., West Toronto.
Reinforced Concrete floors, No. 3 Police Station, Hamilton, Ont.
Reinforced Concrete floors and vaults, Toronto General Trust Bldg.
C. P. R. Station at North Parkdale.
Reinforced Concrete floors, Public School, Berlin, Ont.
Alterations to Deaconess Home, Toronto, Ont.
Reinforced Concrete floors, St. Pauls Church, Toronto, Ont.
Three Storey Reinforced Factory, Ford Motor Co., Walkerville, Ont.

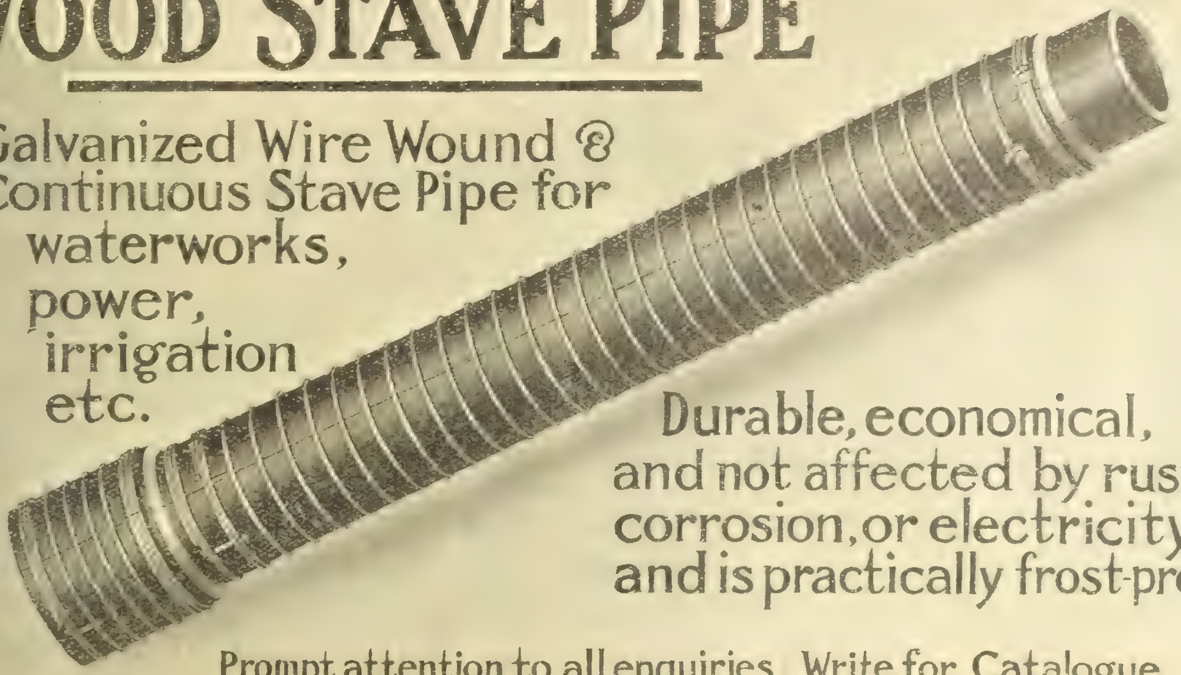
We do all kinds of building or concrete work, our specialty being

Reinforced Concrete Factory Construction

Wells & Gray, Limited

ENGINEERS AND CONTRACTORS

315 Confederation Life Bldg., - TORONTO, ONT.



WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

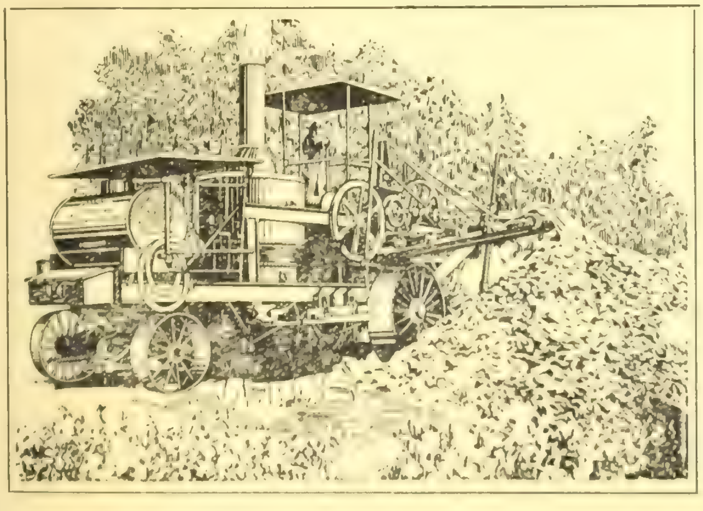
Designers and builders of road making and contractors' machinery

Block Stone **Dimensions** **Random**
Head Sills **Shoddy** **Stone Sawing**

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

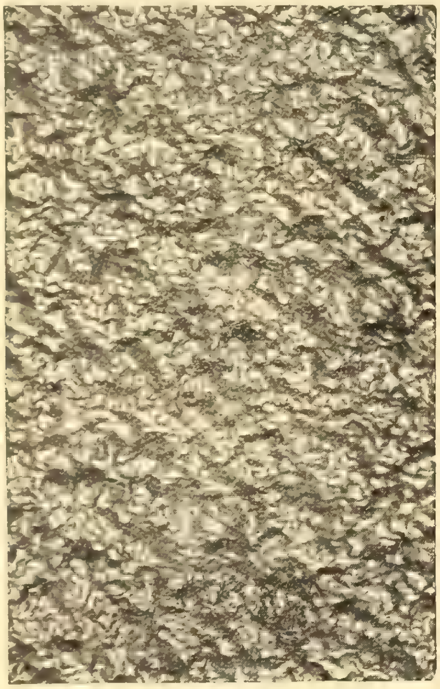
Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Chance's Figured Rolled Glass

has a smooth and bright surface for cutting, and a deep, sharply defined pattern which gives it a peculiar brilliancy. It cuts easier and looks better than other makes.



Chances Figured Rolled Pattern G
Registered No. 297,595

Chance's Figured Rolled Glass is made in white, blue, green, wine and amber, and in a great variety of patterns. "Pattern G," illustrated here, is a favorite with many architects.

To Architects, Builders and Contractors we will be glad to send, on request, samples, in a variety of tints, of Figured Rolled, Double Rolled Cathedral, Muffled and the new Flemish Glass, manufactured by Chance Bros. & Co., Limited, at their famous glass works near Birmingham, England.

Among the samples you will find glass suited for your very best work, and moderate in price. Write for them now.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Canada's Largest Reinforced Concrete Building

constructed throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

Branches: Toronto, Montreal, Winnipeg, Vancouver

Vitrified Salt Glazed Sewer Pipe

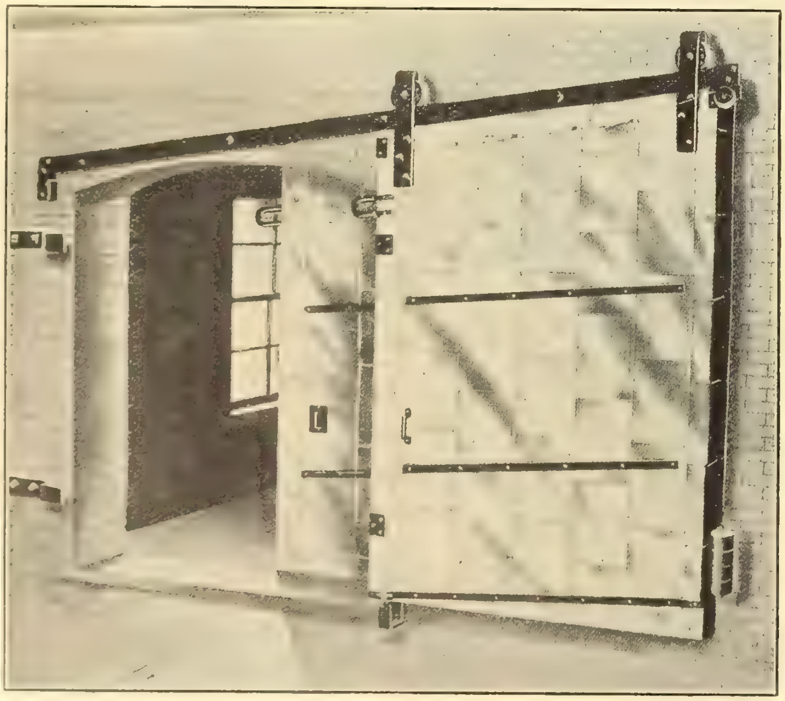
Sizes 4" to 24" inclusive

Write for Catalogue

is what you want for your Sewer. This may be the cement age as far as work above ground goes, but for buried folly it will soon find you out. New cases of the **unsuitability of Cement Pipe** for sewers are coming to light every day, the latest being in **North Battleford, Sask.** where the **whole system of cement sewers is condemned** by the Government Expert before a single house connection is made. Why? Because the pipe were running more than **half full of water absorbed from surrounding soil,** and the joints were **crumbling away a few months after installation.**

Have you ever heard of a similar occurrence when **Vitrified Clay Pipe** was used?

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones: Park. 422 Evenings or Holidays, Park. 3888 and 3889 Toronto Connection



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P. Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or airtight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

DENNIS-LONDON ORNAMENTAL IRON

The **Dennis Wire & Iron Works Co.**

London, Canada Limited

Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED

50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

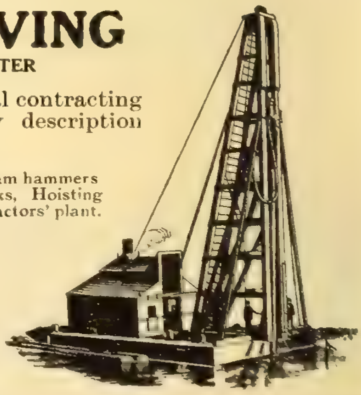
PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

John T. Hepburn

Derricks, Cranes and Winches

We manufacture Winches, Cranes and Derricks for all purposes, and in all sizes

Scotch Derricks
Overhead Cranes
Foundry Cranes
Warehouse Cranes
Crab Winches

They are made outright in our own shops. They have been tested under all conditions, in all parts of the Dominion. They are right in every detail.

We are glad to quote for anything in this line

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 **TORONTO**

Branches: Vancouver and Winnipeg
Montreal

The

Phœnix Bridge & Iron Works

MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P. 1040

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds

(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

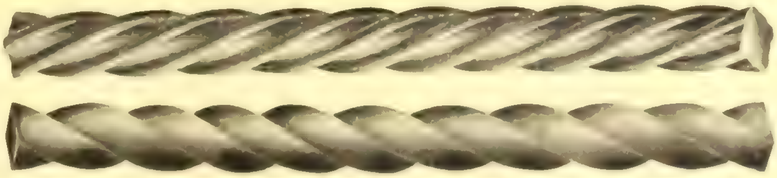
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing. Also ¼" soft steel rounds.

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC T'WISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. (Suburb of Buffalo N. Y.)

Toronto Office
117 Home Life Building

This space is ordinarily used to explain the advantages of

Herringbone Metal Lath

It is useless now. We have been running day and night for several weeks past and the orders are still gaining on us. When our new machinery is installed we will again explain why **Herringbone,** which is not the cheapest metal lath on the market, is such a favorite among close figuring contractors. At present we are merely holding this space.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

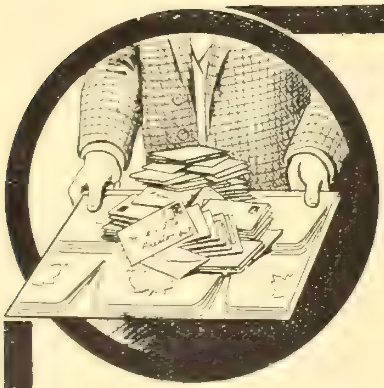
Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230



The mails are bringing us record-breaking orders for

PRESTON SAFE-LOCK SHINGLES

We wish to thank the builders and contractors for the many orders they are giving for PRESTON Safe-Lock Steel Shingles. We are glad that the superior merits of PRESTON Shingles are recognized by the building trade.

We have done everything in our power to make PRESTON Safe-Lock Steel Shingles the top-notch roofing material. They are made and galvanized according to British Government specifications. They are safe-locked on all FOUR sides. They are unaffected by strains due to shrinking of sheeting or settling of building. Completely proof against rain, snow, wind, fire and lightning.

A booklet explaining their superior construction will be mailed free on request.

Metal Shingle and Siding Company, Limited
Preston, Ont.

Branch Office and Factory:
Montreal, Que.

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

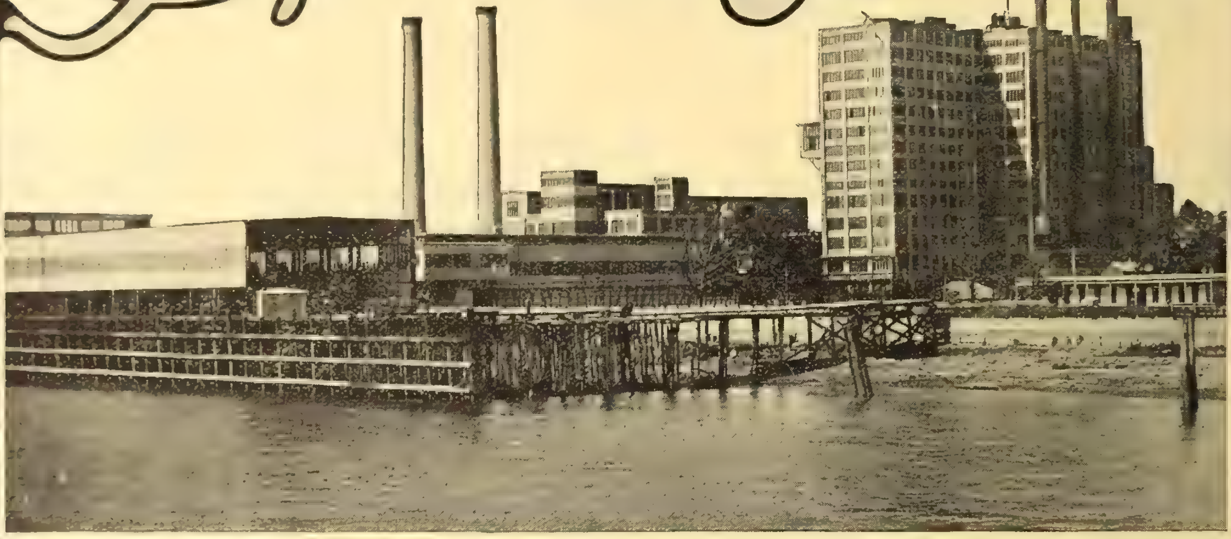
Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

Barrett Specification Roofs



Largest Sugar Refinery in the World

ANY group of commercial buildings that are described as the "largest in their class" are practically sure to carry Barrett Specification Roofs.

The problems of cost and maintenance of such large areas bring into clear relief the economy of roofs of this type.

A Barrett Specification Roof is made of five alternate layers of "Specification" Tarred Felt cemented with "Specification" Pitch, with a top surface of gravel, slag or tile.

The Barrett Specification prescribes with exactness the correct and practical way of using these materials so as to obtain maximum durability at minimum cost.

The cost per year of service is far lower for these roofs than for any other type, owing to their long life and freedom from painting and other maintenance cost.

The above illustration shows the American Sugar Refinery at New Orleans. It is the largest sugar refinery in the world, costing $4,000,000 with a roof area of about 500,000 square feet.

A Barrett Specification Roof was decided upon because the experience of 25 years which the American Sugar Refinery Co. had with similar roofs, had been most satisfactory, and because they knew that such roofs never needed painting or coating like metal or ready roofings.

Booklet and further information will be sent free on request.

The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers

Made in two sizes

No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money { **On the first cost of machine**
On cost of operation
On cost of mixing concrete

Our Automatic Machines do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired.

We also manufacture a Standard Drum Batch Mixer in four sizes, 7 ft 10 ft. 20 ft. and 30 ft. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada.

Hardwood Flooring

"Empire" Quality

Just Rockhard Facts

When you want Maple or Beech Flooring of "Empire" Quality, flooring which has been made from good lumber and has been kiln dried and manufactured properly, and grades which have not been "blended" to meet price competition send us your orders.

Competitive stock bought at a lower price is not a good advertisement to you if it results in a dissatisfied customer who will soon forget the difference in price but he will not forget the poor flooring.

Regardless of price our high standard of quality will not be changed, nor shall we try to fool you by mixing grades.

"Empire" Quality results from good lumber, superior millwork, years of experience, and the most careful and systematic attention to detail exactness.

[illegible]

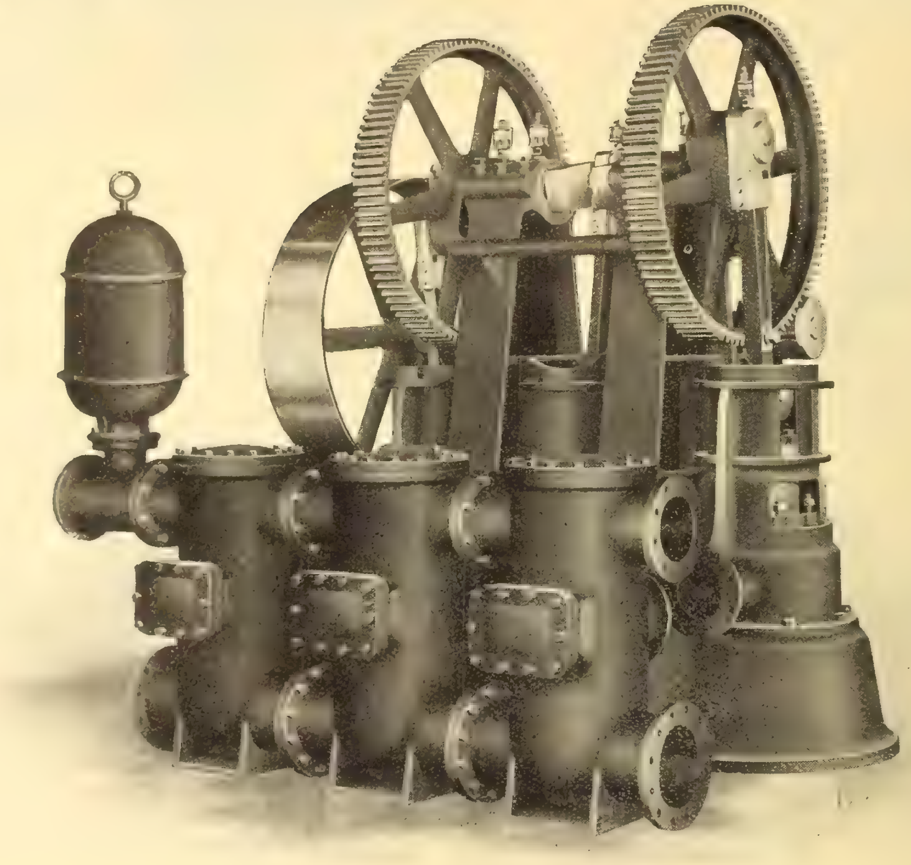
J. R. Eaton & Sons

Limited

Orillia, Ontario

Montreal Agent [illegible]

Special Machinery



10 in. x 12 in. Single Acting Triplex Plunger Pump.

Our Plant and Equipment are modern and up-to date in every respect—and as a consequence we are enabled to promptly execute all orders for Plate Work, Pumps, Pumping Machinery, Engines, Boilers of all kinds.

We have just made and installed four (4) of the above pumps for the T. Eaton Co'y, Limited, Toronto. We do all kinds of repair work including ship repairs.

Give us an Opportunity to Serve You

The John Inglis Company

ENGINEERS AND BOILERMAKERS **Limited**

Sole Canadian Manufacturers of Erie City Water Tube Boilers, Vertical and Horizontal

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.

The city council will advertise its intention to construct a permanent pavement on Front street from Bridge street to Victoria avenue. Cost, about $1,500.

Biggar, Sask.

The town will expend $15,000 on fire protection and waterworks.

Brantford, Ont.

The contractors for Market street bridge have instructed the city that the structure will be ready for paving by November 30th.

Fredericton, N.B.

Notices have been issued by the Roads and Streets Department calling for tenders for furnishing 3,000 tons of trap rock for the coming winter. City Clerk, McCready.

Hamilton, Ont.

Tenders addressed to J. L. McLaren, chairman Board of Control, will be received until October 19th for construction of pipe sewers on portions of six streets. Plans, etc., at office of city engineer. S. H. Kent, city clerk.

The announcement that the citizens will be asked to vote on another good roads by-law this year for $100,000 is causing a lot of discussion. The general feeling is in favor of it. Conditions of the asphalting on Main street east, King street west, John street south and Bay street south is only a part of the scheme.

Kincardine, Ont.

Mr. A. Malcolmn, mayor, and W. Hunter, the committee appointed to report on the system of sewers in Wingham, have presented a report favorable to the adoption of a similar system here.

Niagara-on-the-Lake, Ont.

The waterworks debenture by-law was carried.

Orillia, Ont.

The town council has adopted plan providing for municipally owned boathouses along the entire C.P.R. esplanade from Main street to the park. The boathouses are to front on a lagoon, beyond which will be built an ornamental driveway and boulevard to the park. The plans will be turned over to a commission and the work will be done as the conditions warrant. A money by-law will be submitted to the people at once to provide for the boathouses, which will be of fireproof construction.

Ottawa, Ont.

City Engineer Ker estimates the cost of constructing sidewalks around the old Sandy Hill cemetery at $3,285. The improvements will not probably be completed until next summer.

Penticton, B.C.

The preliminary report on the [illegible] water system which has been prepared by Mr. F. H. Latimer, was presented at the meeting of the municipal council. A by-law providing for the raising of the necessary money to undertake the construction work in connection with the water service will be placed before the people.

Renfrew, Ont.

Mr. H. G. Acres a hydro-electric commission engineer of Ontario, Mr. J. R. Stewart, town engineer, and a few others are at present at the upper lakes of the Bonnechere to look into the matter of building dams for the reservation of water.

Rosthern, Sask.

On the 24th October, a debenture by-law to raise $2,560 for constructing permanent street crossings will be submitted.

Sherbrooke, Que.

It is understood that tenders have been called for a crusher to be used on waterworks reservoir here.

St. Andrews, N.B.

Tenders have been asked from several contractors by C.P.R. Engineer Lumsden for the excavating and laying of the water pipes from Chamcook lake to this town. A 25 h.p. gasoline engine will be used to force the water up (24,000 gallons per hour). Should the town join with the company, another chamber like the one being installed will be constructed.

St. Catharines, Ont.

The Board of Works recommended a bitulithic pavement for Queenston street, average width 35 feet. Probable cost, $31,000. Work to be done by city engineer's department. Report was adopted.

The citizens will be asked to vote in January on the advisability of providing a second water main from the city reservoirs to the city to meet the increasing demands for fire and domestic purposes.

Sydney Mines, N.S.

At the last meeting of council authority was given to borrow $14,000 for water extensions and to purchase a steam roller for street purposes.

Toronto, Ont.

The construction of brick and asphalt pavements has been recommended by City Engineer Rust to cost about $60,000.

The council passed the recommendation of the Committee on Parks and Exhibitions, for the improvement on University avenue, the estimated cost being $30,000.

A recommendation was brought before the directors of the Canadian National Exhibition for pavements to be constructed on certain of the roads through the grounds before the next Exhibition.

Vancouver, B.C.

The city engineer has prepared an estimate on the cost of lateral sewers which will drain into the trunk sewer at present under construction in West Mount Pleasant, the total cost of which will be approximately $21,480.

Victoria, B.C.

The city engineer has reported to the streets committee that to widen and pave Douglas street from Humboldt street to the junction of Douglas street with Superior street with asphalt and lay sidewalks, curbs and gutters, will cost $67,000; $40,725 of that being for paving.

Walkerville, Ont.

Pending the presentation of a petition by the Walkerville Land Building Company for the construction of a lateral sewer between Devonshire and Argyle roads, etc., the council directed the town engineer to prepare the necessary plans and specifications and to invite tenders for its construction.

Winnipeg, Man.

Tenders addressed to the chairman, Board of Control, were received until October 14th for supply of wrought iron well casing.

At the next civic elections the rates payers will be asked to vote on a ten-million dollar by-law to provide a permanent water supply. Controller Cockburn is interested.

Tenders are to be called for the following works: Sewer in Clifton street, from Livinia to Sargent avenue, estimated cost $49,654; sewer in Sargent avenue from Clifton to Strathcona street, estimated cost $6,757; sewer in Centre street from the Assiniboine river to Portage avenue, estimated cost $19,382; sewer in Ash street from the Assiniboine river to Godfrey avenue, estimated cost $44,495; sewer in Godfrey avenue from Cambridge street to Renfrew street, estimated cost $56,905; sewer in McPhillips street from Selkirk avenue north to the city limits, estimated cost $76,400.

AWARDED.

Glace Bay, N.S.

Contracts for the water extensions were awarded as follows by the town council: For laying 6-inch pipe, to S. Nicholson; for 4-inch pipe, to Neil N. McDonald; for 2-inch pipe, to Thomas McLean and R. D. McIntyre.

High River, Alta.

McKibbon Bros., Calgary, have started on contract to construct 3,000 square yds. of cement sidewalk at 9½ cents per sq. foot. The contract for 800 barrels cement was closed at $3.20 per barrel f.o.b. here.

Qu'Appelle, Sask.

The Western Paving Company, of Regina, were awarded a contract for half a mile of cement walks.

St. Catharines, Ont.

Mr. [illegible] has been awarded the contract for the bitulithic pavement on Queenston street, $31,000.

Swift Current, Sask.

Tenders were received as follows for the supply of electrically driven pumps for the [illegible] Pneumatic tanks, $1,950; (G), $21,500, extras, $3,265. Kilmer, Pullen & Burnham, Toronto, Ont., [illegible] work. Smart Turner Machine Co., Hamil

ton, Ont., (F), $7,338, without tanks. Canadian Boving Co., Toronto, Ont., complete without outside work, oil engine $44,000, gas engines $41,000. Canadian Westinghouse Co., Hamilton, Ont., (F), $3,335, no outside work; (G), $13,975. E. Leonard & Sons, London, Ont., (C), $3,700, no outside work; (G), $19,075, extras $2,370. Canadian General Electric Co., Toronto, Toronto, Ont., (E), complete, $6,045; (F), $38,868, $8,970; (G), $24,075. Drummond, McCall & Co., Montreal, Que., (E), $6,100; (G), $21,600. Chapman & Walker, Toronto, Ont., (E), $8,650; (F), $16,650; (G), $25,000. Allis-Chalmers-Bullock, Montreal, Que., (E), complete, $7,200; (F), $46,100, $10,550; (G), $28,470. Accepted tender, Chapman & Walker, incorporating Allis-Chalmers-Bullock, complete, $45,750.

Vancouver, B.C.

Evans, Coleman & Evans were awarded the contract for the supplying of sewer and drain pipe for the city by the board of works at a meeting recently, with the exception of 24-inch storm sewer pipe, which was awarded to the Dominion Glazed Cement Pipe Company.

Victoria, B.C.

The contract for paving on Fort street, between Yates street junction and St. Charles street, has been awarded to the Warswick Paving Company, the engineer to give such grades and levels as will enable the widening scheme to be carried out if the owners desire.

Railroads, Bridges and Wharves

Black Point, N.S.

Tenders are called until Nov. 7th for construction of breakwater here. R. C. Desrochers, secretary, Public Works Department, Ottawa.

Duncan's Cove, B.C.

Tenders are called until November 7th for construction of breakwater here. R. C. Desrochers, secretary, Public Works Department, Ottawa.

Gravenhurst, Ont.

Tenders are being received by the Public Works Department until Nov. 8th for construction of wharf here. R. C. Desrochers, secretary.

Hamilton, Ont.

It is rumored that the men who control the charter of the Southern Ontario Pacific Railway intend building a line from Guelph to this city. It is thought that the C.P.R. is behind the move. Application has been made to Ottawa for permission to build the line.

London, Ont.

A deputation composed of Hon. C. S Hyman, Hon. A. Beck, T. H. Purdom, Mayor Beattie and others, will wait on Minister of Works to ask for improvements on the harbor at Port Stanley.

Levis, Que.

It is understood that the plans and proposals of the Dominion Dry Dock Company for a $4,000,000 dry dock of the first class have been referred back to the company, after an examination by the engineer of the Public Works Department, Ottawa, and unless the company makes a very great revision of its demand for a subsidy their application for aid is not likely to be approved. It is understood that an examination of the company's plans does not indicate that the cost should be what the company by its proposal appears to anticipate. The application of Vickers Sons & Maxim for subsidy for a first class $4,000,000 dry dock in Montreal is likely to be favorably received by the Government. The plans are still under consideration, but are likely to be dealt with finally within a short time.

Maisonneuve, Que.

The Lachine, Jacques Cartier & Maisonneuve Railway will construct a subway on Iberville street between Mount Royal and Rachel streets.

Quebec, Que.

Plans have been completed by the Strauss Bascule Bridge Company, 134 Monroe street, for a steel and concrete bridge 88 feet long to span the Princess Louise docks.

Renfrew, Ont.

The bridge over the creek on Main St., Renfrew, is being renewed.

Stratford, Ont.

By taking over the charter of the St. Mary's & Western Ontario Railway, the Canadian Pacific Railway Company has at last gained entrance to the city of Stratford and the farming district thereabouts. The line from Stratford to the Grand Bend, on Lake Huron, originally intended to be an electric line, will be rushed to completion by the C.P.R. at once, as a steam road, and will run in a southwesterly direction, passing St. Mary's, where the C.P.R. already has a line within about three miles, and through Exeter and other small places to the lake. Another line is projected from Stratford to run in a northwesterly direction to Linwood, a small junction point on the Toronto-Goderich line of the Canadian Pacific.

Three Fathom Harbor, N.S.

Tenders are called until November 7th for construction of beach protection work here. R. C. Desrochers, secretary, Public Works Department, Ottawa.

Tp. of Elgin, Ont.

On November 15th a by-law will be taken into consideration by the county council to issue $10,000 bridge debentures. K. W. McKay.

Toronto, Ont.

The Dominion Railway Commission has ordered the G.T.R. to have the Brock avenue subway ready within six months after approval of plans. Plans to be submitted to board by October 26th.

City Engineer Rust estimates the cost of constructing a subway on Ashdale avenue, including land damages, at $45,000.

Union Bay, B.C.

Tenders addressed to H. E. Beasley, superintendent, will be received until November 1st for clearing of the right-of-way of the Comox extension, E. & N. R.R. between Parksville and here. Specifications at office of the divisional engineer, E. & N. Railway, Victoria.

Winnipeg, Man.

Tenders are veing called until November 2nd for construction of pile protection pier by Public Works Department. R. C. Desrochers, secretary.

AWARDED.

Beaufort, N.B.

The contract for Elliott Brook bridge in the Parish of Aberdeen, Carleton Co., has been awarded to Mr. John Lee, Sr., of Beaufort, Carleton Co., $1,000.

Mattawa, Ont.

Stewart & Hewitson, Port Arthur, Ont., have been awarded the contract for the construction for a steel and concrete bridge over the Ottawa river here. The bridge will be 2,700 feet long, and some piers 50 feet high. The total cost will probably run over $300,000.

Fort William, Ont.

A.C. Stewart & Company Nanton Building, Winnipeg, Man., have been awarded the contract for construction of bridge over McKellar river for the C. P. R. Frank Lee, division engineer. Estimated expenditure, about $250,000.

Hull, Que.

Joseph Cousineau has been awarded contract for rebuilding the Gatineau river bridge in Hull. The cost will be about $5,000.

Minto, N.B.

The Commissioners of the New Brunswick Coal & Railway Company have accepted the tender of Paul Lea & Company, Limited, Moncton, for the erection of a new round house at Minto, $2,750.

Ottawa, Ont.

The Elmitt Lumber Company of this city has been awarded the contract for the timber for the new Government dock at Three Rivers, Que. It is for about $60,000. Owing to inability to get native timber of the required lengths, at this season of the year, a shipment has been ordered from Florida. This comprises about one-third of the total amount of timber to be used.

Victoria, B.C.

Eight bids for the construction of the sea wall along Dallas road foreshore were received and were as follows: Louis A. Borde, $140,756, or if any rock race instead of granite, a reduction of $11,010 will be made; Parfitt Bros., $110,984; Hugh MacDonald, $112,588; Moore & Petick, $94,837; Pacific Coast Construction Company, $74,389 (accepted); Westholm Lumber Company, $87,336; W. E. Wilson, $78,777; City Engineer, $89,437. Mr. Borde's bid was not accompanied by the necessary cheque.

Public Buildings, Churches, Schools, etc.

Armstrong, B.C.

A new Roman Catholic church is to be erected here.

Boissevain, Man.

$5,000 will be expended for new heating system, etc., for town hall.

Brandon, Man.

The plans are here for proposed addition to the post office building to cost about $30,000. When the plans submitted are decided upon, it is likely the contract for the work will be let immediately.

At the regular meeting of the school board a report was received from the collegiate stating that the rooms there are very congested. The board of education will take preliminary steps to erect a school in the east end of the city, at about $40,000.

The school board has decided to go ahead with the new $40,000 school in the east end of the city. A by-law to raise the money by the sale of debentures will be submitted.

Tenders were called until October 15th for brick work only of the new city stables and depot. W. A. Elliott, architect; H. Cater, chairman Sanitary Committee, city council.

Belleville, Ont.

The Board of Education decided to purchase for a school site the Taylor property on Pine street, in the north part of the city, where building sites are being rapidly bought by Grand Trunk Railway employees. The Lingham property on William street, wanted for a school site, will go to arbitration.

Tenders are called until October 20th for reconstruction of meat market for police station. J. G. Lindsay, city engineer.

Bassano, Alta.
The school board have decided to have a $15,000 school erected.

Calgary, Alta.
A by-law to give $150,000 towards a university will be submitted to the ratepayers.

Camrose, Alta.
A Scandinavian College is to be erected this fall.

Chatham, Ont.
Wilson & Son, architects, are preparing drawings for a new ventilation system and a more modern fire service in the County House of Refuge. The system will be installed ready for use before winter commences.

Calgary, Alta.
W. Georgeson, G. Tempest, E. A. Dagg and Mr. McElroy nave requested the finance committee for a load from the city's sinking fund to build a new commercial club to be known as the Alberta Club. The matter was referred to the city solicitor.

Estevan, Sask.
Alderman Coffin proposes to build a $25,000 hospital, and a by-law will be submitted.

Edmonton, Alta.
H. E. S. Davins, of Pittsburg, Pa., representative of Great American Industrial College, capitalized at $25,000,000, is here with a view of establishing a college to cost about $3,000,000. The administration buildings will cost $1,500,000. The college will occupy 1,500 acres. Construction will not start until the spring.

The Y.M.C.A. will inaugurate a campaign to raise $36,000 for extension purposes and to wipe off the debt on the building.

The library Committee (K. W. MacKenzie, chairman; E. Ross Palmer, secretary; Mr. Justice Beck, Ald. Lundy, Dr. Riddell and Mr. Louis Madore), will ask the city council for a reasonable annual grant, and make further move towards erection of Carnegie library.

Fort William, Ont.
The original plans for Carnegie library will have to be changed as according to instructions the building must not be a joint club house and library, but a library exclusively. Hood & Scott, architects. As soon as plans are approved work will be commenced on excavation.

A resolution was adopted instructing the special committee on the police station and court house to proceed with the advertisement for tenders under the plans and specifications prepared by Architect Mason.

Grosswerder, Alta.
A school is to be built. Tenders closed on October 17th with John [illegible], trustee.

Grandview, Man.
A school and outbuildings are to be erected for Valley River School District. Thos. J. Brown, secretary-treasurer.

Gretna, Man.
The building of the new school has been delayed, owing to the tenders being $1,000 more than the $12,000 allowed.

Harriston, Ont.
Mr. Alex. M. Martin, M.P., of Mount Forest, has a letter from the Department of Public Works, Ottawa, stating that provision is being made for an armory here. The department expects to be able to call for tenders during the present year for this building.

Holden, Alta.
Rev. Father Husson, of Edmonton, was here regarding the building of a new Roman Catholic church.

Kingsville, Ont.
A by-law will likely be submitted to the ratepayers at the January election to raise the required amount ($5,000) to receive the benefit of the Carnegie Library fund.

London, Ont.
Tenders addressed to A. E. Nutter, city architect, will be received until October 21st for eerction of Alexandra school on King and Colborne streets. Plans, etc., at office of city engineer. Dr. A. J. Wyckoff, chairman, Board of Education.

Lethbridge, Alta.
A $10,000 Roman Catholic church will be erected.

Leslie, Sask.
A public school is to be erected here next spring, the foundation being taken out this fall.

Melville, Sask.
Tenders were taken to October 13th for erection of a hospital building. John Crow, secretary.

Merritt, B.C.
Messrs. W. E. Duncan, M. L. Grimmett and others are on the committee to make a preliminary report regarding the proposed hospital here.

Montreal, Que.
A clubhouse will be erected for the newsboys of Montreal shortly. The proceeds of the recent exhibition and fair held by the Boys' Sunshine Society, will be devoted to this work.

Negotiations are under way for the selling of the Labor Temple. If this deal goes through, the Union will erect an up-to-date, 9-storey office building.

The Industrial Commission will call for tenders for a suitable site for the Exhibition of 1912. Tenders will be opened November 9th.

Moose Jaw, Sask.
Tenders were called until October 24th for excavation of the Saskatchewan College Building. R. G. Bunyard, architect.

Ottawa, Ont.
The recommendation of the Board of Control regarding the Heenon-Froude incinerator did not pass council. Noted in last issue.

Tenders will be called shortly for the Rivermead Golf Club on Aylmer road. Weeks & Keefer are architects.

Outremont, Que.
Messrs. Hutchison, Wood & Miller, architects, Royal Insurance Building, have prepared plans and specifications, tenders for which have been invited for the erection of a municipal building here.

Portage la Prairie, Man.
The Indian School is to be removed to a new site near town. Rev. Thurlow Fraser is interested.

The Young Women's Christian Temperance Union are planning a campaign to arouse interest in the need of a Y.M.C.A here.

Port Arthur, Ont.
Tenders were wanted for sub-structure of Swedish Lutheran church, to October 14th, by A. Young, 33 Jean street.

Prince Albert, Sask.
The by-law to spend $2,070 on site for armory here was defeated; that for improvements to city hall was carried. C. O. Davidson, city clerk.

Renfrew, Ont.
Messrs. Ferguson, Barnet & McLaren were appointed on a committee to look into the matter of the erection of a new main building for exhibition purposes.

St. Louis du Mile End, Que.
Tenders are called until October 24th for post office here by Public Works Department, Ottawa. R. C. Desrochers, secretary.

Swift Current, Sask.
The ratepayers will vote on expending $25,000 for a hospital building.

Three Rivers, Que.
Chas. Laford is the arcnitect in charge of the repairs to the public building here. Estimated cost, $30,000.

Toronto, Ont.
Plans for an extension to Canadian National Exhibition Art Gallery have been approved. Estimated cost, $40,000.

The school board of Runnymede school section have decided to erect a 6-room school, Mr. Jackson, chairman.

A permit was issued for the erection of an addition to tne Earlscourt school, on the west side of Dufferin street, near St. Clair avenue, $36,000; also two-storey brick school on Pine avenue, $25,000.

Virden, Man.
On October 20th the ratepayers will vote on $2,500 5 per cent. 20 instalment school debentures for S. D. of Reston. A. P. Power, secretary-treasurer, Virden, Man.

Vancouver, B.C.
At the annual meeting of the King's Daughters it was decided to build a convalescent home in this city. It will in all probability be built in the Capilano district. Mrs. C. S. Battle, chairman; Miss Lucie Cumming, corresponding secretary.

Dalton & Eveleigh, this city, are reported to have prepared plans for an isolation hospital here.

A permit was issued to Rev. S. Sasaki for Buddhist Temple, Albert street, $15,000.

Grant & Henderson, this city, are the architects for the new rectory and parish hall to be erected for St. Paul's Church here. Estimated cost, $13,000; size, 32 x 42 and 60 x 60; 3-storey.

Victoria, B.C.
Sanitary Inspector Lancaster, Dr. G. A. B. Hall and Alderman Raymond were appointed to report on plans for improvements on Isolation hospital.

The provincial government, it is stated, has selected the site for the new drill hall, which has been approved by Lieut.-Col. Currie, of Work Point Barracks, representative of the federal government. Work will not likely be undertaken until next season.

Warren, Man.
M. S. Peacock, secretary-treasurer, school board, Warren, writes that the contract for school here will not be let this year.

Wallaceburg, Ont.
Tenders are being called until October [illegible] for the erection of a Methodist church here. Plans, etc., at office of Messrs. [illegible] & Williams, architects, Windsor.

Weston, Ont.
It is probable that a by-law will be submitted [illegible]

for a four-roomed addition to the public [illegible]

Wainwright, Alta.

The Presbyterian Board of Trustees decided to build a church this fall. Rev. Mr. [illegible] will be in charge.

Winnipeg, Man.

A permit was granted to J. A. Schuberg for a new moving picture theatre to be erected on Notre Dame, $24,000.

At the municipal elections in December the public will vote upon two by-laws for hospital buildings. One is to add to the General Hospital and the other to construct a municipal hospital. The sum of each by-law is $400,000. A third by-law may be submitted for $350,000, for buildings for the North Winnipeg hospital.

The Methodists and Presbyterians will erect a city church for the Chinese. C. A. Coleman will have charge. Rev. Dr. Baird is chairman.

The Deaf and Dumb Institute and the Children's Home are to be moved to the Agricultural College grounds.

It is stated that a new drill hall is in prospect for this city and that the Government is planning to abandon the present site of Fort Osborne barracks. Large and substantial buildings for the permanent militia will probably be erected on the property acquired for a rifle range west of the city.

AWARDED.

Chatham, Ont.

John McKay has the contract for plumbing and compression tank system for the Dresden school.

Crossfield, Alta.

Geo. Becker, this place, has been awarded the contract for the erection of the 2-storey and basement brick school here, $13,000; Mitchell & Olding & McKinnon, Calgary, tendered at $16,475; R. Hunter, Calgary, at $15,800.

Elkhorn, Man.

The new public school here is being erected by Brockelbank & Talmey, of Melville.

Fort William, Ont.

The contract for fire hall annex was let to M. H. Braden. Mr. Braden submitted an amended tender under which the specications were modified and the cost, making the amount of tender $16,698, instead of $17,300, which would have been the cost under the original specifications.

Peterboro, Ont.

The tender of $549 from Alexander & Miller for electrical fixtures for the public library was accepted. The architects will be instructed to complete the plumbing and heating without delay.

Sherbrooke, Que.

The contract for the addition to the Seminary St. Charles has been awarded to Mr. C. Beauchesne. Next spring a new wing will be added to the east end of the building.

Scott, Sask.

Mr. Coy, of Saskatoon, secured the contract to erect the new town hall on a bid of $8,382.

Residences

Cupar, Sask.

A parsonage is to be erected for the Anglican Church. Rev. H. T. Hitchen, pastor.

Montreal, Que.

Mr. Alphonse Piche, architect, Victoria building, is preparing plans and specifications for the erection of an apartment house on Dorchester street for Mrs. H. Faute.

Ottawa, Ont.

Among the recent building permits were: Gandias Lingham, dwelling, Mackay street, J. B. Davis, builder, $3,000; David Biggs, dwelling, Powell avenue, $3,000; Camille Leitreille, dwelling, Hamilton avenue, $3,500; Hon. Sidney Fisher, residence, Laurier avenue east, C. P. Meredith architect, W. G. Adamson and F. McCullough builders, $16,000; Nimmo and Soper, dwelling, Carling avenue, $3,500; Thomas Richards, dwelling, Sunnyside avenue, F. A. Wilson builder, $4,000; F. A. Wilson, dwelling, Gordon street, $4,500; J. H. Bowman, dwelling, James street, J. W. Stanley builder, $4,000; Willis Loucks, dwelling, Widsor avenue, $3,000; John Black, dwelling, Archibald street, N. Hollister, $4,000.

Prince Albert, Sask.

Garnet Coombs will have a brick residence erected to cost $5,000.

Toronto, Ont.

Permits were given to J. J. Walsh ,two-storey brick apartments, Queen and Wilson streets, $15,000.

The Union Trust Company have sold residential property on Glen Grove avenue to R. C. Bustard, 1558 Yonge street, who will erect houses costing from $8,000 to $10,000 each on the land.

Vancouver, B.C.

Permit was issued to Messrs. Dickie & Dogmore covering the erection of a six-storey apartment house at Smythe and Seymour streets. Estimated cost, $126,000.

Winnipeg, Man.

Chas. F. Pentland, manager of the Quebec Bank, has purchased a site and will build a residence.

J. Chalmers has purchased a site on Nairn avenue, Elmwood, and will build in the spring.

Recent building permits include: Wm. Lyon, brick dwelling, Argue street, between Delaware and Cumberland avenue, to cost $2,500; C. R. Reed, three brick dwellings, Picton street, corner Catharine street, for John Young, to cost $6,000; S. S. Chiswell, house, west side of Lipton, between Livinia and Ellice, $2,000; Ed. Noe, two houses, north side Jessie, between Hugo and John, $6,000; E. Russell, two houses, east side Aubrey, between Portage and Buell, $5,500; F. Moses, house, north side of Stella between Aikins and Salter, $2,200.

AWARDED.

Edmonton, Alta.

Wilson Herrald, architect, awarded contract for Presbyterian manse to Grant & Company.

Business Buildings and Industrial Plants

Amherst, N.S.

The carriage factory of S. Fillmore, Southampton, 20 miles from here, was destroyed by fire on the 11th inst. Estimated loss $35,000.

Battleford, Sask.

Plans are being prepared by A. E. Brown for a new Albion Hotel for Mr. Angle, proprietor.

Brantford, Ont.

The proprietor of the Kerby House has decided to make additions to the hotel at an outlay of $5,000.

Ald. J. W. Shepperson is the present secretary-treasurer of Ham & Nott Company and will be sales manager for the Niagara Bedstead Company, Buffalo, mentioned in last week's issue as establishing a branch here. Industrial Commissioner, Mr. Dowling.

Brandon, Man.

Robert Lane has decided not to erect his business block until the spring, owing to tenders being high. Excavation is completed.

It is stated that the C.P.R. has decided to build here next year a handsome new depot and possibly a hotel and that the plans for the station, at least, are now in their preliminary stages. It is also said that the company has bought or has options on property which will be required in the event of the proposed improvements going ahead.

Brampton, Ont.

The flour mills of H. Bracken & Son at Boston Mills, were destroyed by fire on the 10th inst. Etsimated total loss, about $15,000.

Berlin, Ont.

Messrs. Baetz Bros. & Company will not remove their plant to Preston as at first contemplated. A loan of about $15,000 has been raised by interested citizens. A new furniture factory will shortly replace the one destroyed by fire some months ago.

Chilliwack, B.C.

F. J. Hart & Company effected the sale of the block bounded by Young, Westminster and Alma streets for $25,000. It is the intention of the purchasers in the spring to erect a solid concrete block.

Calgary, Alta.

T. J. S. Skinner is about to erect a 7-storey building on the northwest corner of Eighth avenue and Second street east.

Carstairs, Alta.

T. E. Driscoll's hotel and Lusk's hall were destroyed by fire on the 9th inst. Estimated loss, $20,000.

Edmonton, Alta.

Negotiations have been practically concluded whereby a soap company, incorporated at $200,000, will be established here.

Fort Frances, Ont.

It is reported that Mackenzie and Mann are negotiating with the Hudson's Bay Company for all the unsold land facing the river between Scott street and the cemetery. It is said that this will be a suitable site for a paper mill.

Goderich Ont.

A. J. Barclay is the architect in charge of the rebuilding of the factory for the Goderich Organ Company Limited. Estimated cost $20,000; estimated cost of equipment, $10,000; size (ground floor), 40 x 48 and 48 x 48; 3-storey. A Saunders, manager.

Hamilton, Ont.

The Acme Motor, Carriage & Machinery Company will locate here. The new concern is a merger of the Baynes Carriage Company of this city and the American Good Roads Machinery Company, of Goderich. The plant here will be greatly enlarged. Proposed directors: S. J. Phillips, Kennet Sq., Pa.; F. W. Woods, of Goderich; M. W. Best and D. P. Perry, Detroit, and W. Southam, H. N. Kittson and P. D. Crerar, K.C., Hamilton, representing the Baynes Carriage Company.

Kingston, Ont.

J. A. Lamsen, Cleveland, Ohio, is to erect a fine hotel at Edgewood Park among the 1,000 islands in the St. Lawrence river. It will accommodate 500 guests.

London, Ont.

Ottawa capitalists are said to be interested in a project to build a new hotel in connection with the C.P.R. plans for improvements in this city.

Ferguson & McAdam's livery on Dundas street was destroyed by fire. Estimated loss, $30,000.

Milestone, Sask.

Plans are being secured for a hotel building here. Mayor J. R. McKenzie is the principal stock holder.

Maisonneuve, Que.

The Molson's Bank will erect a branch bank building here shortly. Plans, specifications, etc., are being prepared by the architect, Mr. H. C. Stone, 84 St. Francois Xavier street.

Montreal, Bue.

The King's Hall building, St. Catherine street west, was destroyed by fire on the 12th inst. Estimated loss on building, $70,000.

The Jacobs Building, St. Catnerine St. west, is to be increased to the extent of four storeys in the spring. J. A. Jacobs, owner.

Nelson, B.C.

The city council granted free site and exemption from taxation to W. H. Kreyscher as an encouragement towards building a shingle mill and box factory here.

Tenders will be received at the office of the architect, Alexander Carrie, for the erection of a two storey brick building in Fairview for William Hancock.

New Westminster, B.C.

Excavation has commenced for the new Bank of Commerce building on Columbia street at a cost of $100,000. The structure, which is to be three storeys in height, is to be completed by October 1st, 1911.

North Bay, Ont.

The council received a communication from J. Farrell, chairman of the Industrial Committee of the Board of Trade, asking the council to take action in regard to the proposition of D. A. Leach, of Sunbridge, who offers to establish veneer plant, basket factory, sawmill, stave and hoop mill. Estimated cost, about $25,000.

Oakville, Ont.

[illegible] ly be torn down and a modern bank building will be erected.

Ottawa, Ont.

[illegible] to locate in Ottawa. There will be an [illegible] of fibre boards out of sawmill waste.

[illegible] sion, Ottawa, is calling for tenders to be received up to November 8th, for the construction of freight sheds and storehouses [illegible]

[illegible] mit for factory, Albert street, $10,000.

Parry Sound, Ont.

The Canadian Northern will establish a [illegible] and proceed next year with erection of an elevator with a capacity of at least 500,000 bushels.

Prince Albert, Sask.

Henderson & Meighen will erect a warehouse for D. W. Adam.

Portage la Prairie, Man.

H. E. Finch, manager Rogers Fruit Company, Grand Forks, N.D., says his firm will build here.

C. H. Mounsey, architect, states that the Hart-Parr Company will not build until next year. Plans are completed.

Port Arthur, Ont.

The Ironclad Enamel Company, of New York, will have a large plant erected here.

Rivers, Man.

Philip Cook, of Portage la Prairie, has decided to have a hotel built here.

Red Deer, Alta.

The Bank of Commerce are letting subcontracts for new building. W. Hewson & Son secured excavation.

Regina, Sask.

The Western Trust Company has plans for the erection of an office building.

J. M. Young reports that a linseed oil mill may be erected shortly in this city.

Brown & Vallance, Montreal, are preparing plans for John Lang's warehouse and office building.

Saskatoon, Sask.

The Saskatoon Investment & Trust Company will have a large hotel erected here to cost over $100,000. Brown & Vallance, architects, Montreal, have plans in hand.

Shawinigan Falls, Que.

It is thought that the decision of the management of the Shawinigan Cotton Company will favor the construction of another big mill in the vicinity of the old. J. N. Greenshields, K.C., president.

St. Thomas, Ont.

A by-law will be submitted to the ratepayers on November 7th to authorize the loan of $30,000 without interest, etc., to the Monarch Knitting Company. In return for which the company promise to erect a factory, not less than 50 x 190 ft., and instal $30,000 worth of machinery.

St. John's, Que.

The by-law regarding the establishment of the Cluett-Peabody Shirt Company, of Troy, N.Y., was approved at a meeting of the ratepayers.

Toronto, Ont.

The Toronto Electric Light Company has received a permit to erect a five-storey brick storehouse on Esplanade street, between Scott and Yonge streets, $140,000.

Vancouver, B.C.

Early in the new year the Canadian Financiers, Limited, will award the contract for the construction of a modern fireproof structural steel office building, seven or eight storeys high, on its two vacant lots on the south side of Pender street, between Homer and Richards street. Mr. P. Donnelly, president and general manager.

The Liberals of British Columbia intend to erect in Vancouver a party headquarters for the province, in the shape of a skyscraper. Their intention is to com- [illegible] monument. It is stated the site is selected. J. W. Weart is organizer.

Plans for a business block, corner of Homer and Pender and 12 storeys high, which will cost $500,000, were presented to Building Inspector Jarrett by Donnellan & [illegible]

Wadena, Sask.

The British North American Elevator Company will build an elevator at Wadena, Sask.

Winnipeg, Man.

J. J. O'Flaherty, of Quebec, will start a boot and shoe factory in this city, to be located on Maple street, next fire hall.

The Bawlf Company are having an elevator built at Stornaway, Man.

Thomas Donley, late proprietor of the Grand Central Hotel, St. Thomas, Ont., has purchased the Empire Hotel here. The hotel will be remodelled and 50 bedrooms added. Mr. Donley will take the Empire over in November.

AWARDED.

Brandon, Man.

The contract was let for the addition of one storey to the Royal George hotel, to Alex McDonald.

The contract let for the proposed new structure for the Empire Brewing Company has been let to C. W. Hall.

Cornwall, Ont.

Mr. Henry Barnhart has been awarded the contract for the excavation of the ground for the proposed new building to be erected at the Ives Modern Bedstead Factory.

Calgary, Alta.

William Garson, of Winnipeg, has the contract to build a hotel here at a cost of $140,000. Burroughs & Richards, of Calgary, are the architects.

Guelph, Ont.

The tenders for the heating plant for Morlock factory were recommended as follows: Cowan & Walker, for the carpentry work and painting, $347; Jos. Shaw, for the masonry, $672; Stevenson & Malcolm, heating, $2,250.

London, Ont.

Hamilton & Stott, of St. Thomas, have the contract for the installation for the Helena Costume Company of a central heating plant. The system to be installed is the Johns-Manville Tile Conduit System, the same as that installed in the city heating plant here. Contract price is [illegible]

Ottawa, Ont.

McKinley & Northwood, of Ottawa, have been awarded the contract for plumbing, heating and ventilation of the Hope building. W. E. Noffke, architect.

Otis-Fensom Company has been awarded the contract for the elevator of the Ro- [illegible] tects.

Saskatoon, Sask.

[illegible] Chicago, have started on erection of the John Deere Company's building, to cost $100,000. The Ontario Building Company, Saskatoon, will supply quarter million brick, and the Saskatoon Hardward Company secured the heating and plumbing [illegible]

Toronto, Ont.

[illegible] erection of brick marble work mill, Atlantic and Pacific, $7,500.

Vancouver, B.C.

[illegible] ful tenderers for erection of branch building for the Bank of Ottawa here. The building will be 8 storeys and basement. W. Marbury Somervell, this city, is architect.

(Continued on page [illegible])

Tenders and For Sale Department

Tenders Wanted

Sealed tenders will be received by the undersigned up to 8 o'clock p.m. TUESDAY, NOVEMBER 1st, 1910, for the construction of about [illegible] yards of Vitrified Brick Pavement with Cement Curb and Gutter in the Town of Petrolia, Ont.

Plans and specifications can be seen at the office of C. A. Jones, Esq., Town Engineer, Petrolia, Ont.

Marked cheque for $500.00, payable to the Treasurer of the Town of Petrolia, must accompany each tender.

The lowest or any tender not necessarily accepted.

J. McHATTIE,
Town Clerk.

Petrolia, October 19th, 1910. 42

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the SEVENTH DAY OF NOVEMBER, at 12 o'clock noon, for supplying to the City of Calgary Rails, Cars, Equipment and Overhead Material for extensions to Municipal Street Railway.

Full particulars and specifications may be had on application to the Commissioners, City of Calgary; marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

Specifications are also on file at the office of the Contract Record, 504 Confederation Life Building, Toronto.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Erection of Bridges," until the SEVENTH DAY OF NOVEMBER NEXT, at 12 o'clock noon, for the erection of steel bridges, one across the Elbow River at Twelfth Ave., and the other across the Elbow River at Second Street East.

Full particulars and specifications may be obtained from the Commissioners, City of Calgary, on application.

A marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

Debentures for Sale

Offers will be received by the undersigned up to the FIRST DAY OF NOVEMBER NEXT, for the purchase of the following debentures, viz.:

(1) $4.250 payable in 30 equal annual instalments with interest at 5 per cent.

(2) $12,900 payable in 30 equal annual instalments with interest at 5 per cent.

(3) $13,250 (Local Improvements) payable in 30 equal annual instalments with interest at 5 per cent.

H. HARTMAN,
Clerk.

New Liskeard, Ont., Oct. 12, 1910. 43

Notice to Contractors

Tenders are being called on a Methodist Church for Wallaceburg, Ont., according to plans and specifications prepared by Jacques & Williamson, architects, Windsor, Ont.

Tenders will be accepted on the complete or separate portions of work up till 12 o'clock noon, OCTOBER 24TH, 1910.

Plans and specifications can be received from the architects. 42

Debentures for Sale

Sealed tenders addressed to the undersigned, marked "Tenders for Debentures," will be received up to 8 o'clock p.m. NOVEMBER the FIRST, 1910, for $30,000 School Debentures for the Town of Dunnville, Ont., interest at the rate of four and one-half per cent. per annum, payable at the Canadian Bank of Commerce, Dunnville, in annual instalments of both principal and interest. No tender necessarily accepted.

J. W. HOLMES,
Town Clerk.

Dunnville, Ont., Oct. 13, 1910. 43

To Contractors

Tenders addressed to the undersigned, and endorsed "Tenders for Ventilation, Parliament Buildings," will be received at this Department until noon on TUESDAY, OCTOBER 25TH, for the ventilation of the Parliament Buildings. Plans and specifications can be seen at this Department.

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender and the bona fide signature and addresses of two Sureties, or the Bond of a Guarantee Company, approved by this Department, must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance.

The Department will not be bound to accept the lowest or any tender.

By order,

H. F. McNAUGHTEN,
Secretary Public Works Department.

Department of Public Works, Ontario,
Toronto, October 14th, 1910.

Newspapers publishing this advertisement without authority will not be paid for it. 42

Price Bros. & Company, lumber, etc., Quebec, Que., have changed style to Price Brothers, Limited; capital increased to $5,000,000.

Hill Manufacturing Company, planing mill, etc., Saskatoon, Sask., are stated to be selling out to the Saskatoon Lumber Company.

H. T. Milne, sawmill proprietor Brown's Corners, Ont., are stated to be giving up business.

The B. C. Gazette gives notice of the following incorporations: Standard Lumber Company, Limited; Irwin, Carver & Company, Limited, incorporated to carry on the business of contractors, etc., capital, $25,000; Columbia Bitulithic, Limited, capital $150,000.

Power Plants, Electricity and Telephones

(Continued from page 27)

Calgary, Alta.

City Engineer Child has returned from a trip of inspection to the power site on the Eubow river, where the city has made application for the right to develop power. His report is favorable to its development for power.

Fort William, Ont.

The surveys for the Rainy River Radial Railway have been made and some plans completed. It is understood that construction may start in the spring.

Halifax, N.S.

The East Pubnico Amusement Company, recently granted a charter, is planning to construct and operate an electric railway from Halifax to the amusement park, at East Pubnico, four miles in length, for which surveys have been made and rights of way secured. The company, it is said, will erect a power house on Grafton street and a substation on Albemarle street. It is understood that work will begin at once on construction of the road. Daniel Hawksmarth is president and G. C. McClure chief engineer, both of Halifax.

Melville, Sask.

E. J. Winger, electrical engineer, of Montreal, wants to build electric light and steam heating plant here.

North Bay, Ont.

The Cobalt Hydraulic Power Company have been granted permission by the Crown Lands Department to place dams at each outlet of the Temagami lake to raise the water for storage purposes to a height of 18 inches above low water mark, for the purpose of ensuring a permanent flow of water for the power plant supplyinf Cobalt. Hon. Frank Cochrane has informed the objectors to the proposition that the dams will not interfere with the interests of Sturgeon Falls.

Niagara Falls, Ont.

Mr. F. J. Roberts, superintendent of the Symmes Construction Company, this city, will shortly undertake the building of a power plant in the Porcupine district. Mr. Roberts states the plant will generate from 6,000 to 8,000 horse power, and will be at Sandy Falls, on the Migozoni river.

Nanton, Alta.

On November 15th tenders will be received for $7,500 5 per cent. 20 year electric light and fire protection debentures. W. Robertson, secretary-treasurer.

New Westminster, B.C.

The construction of an electric interurban railway between New Westminster and Ladner, B.C., is reported to be under consideration by the Boards of Trade of this city and of Ladner.

Ottawa, Ont.

An extension of the Ottawa Electric Railway will be made into the Bayswater district if the city will put the roads over which the tracks would have to be laid into good condition and remove a sidewalk. The company agreed to build extensions through Ottawa South as soon as a high level bridge is constructed over the Rideau Canal at Bank street. Thos.

Ahearn, president, Ottawa Electric R.R.

The Minister of Railways has approved the application of the Toronto & Eastern Railway Company for approval of its route map from Oshawa to Cobourg and also to Lindsay and Port Perry.

Peterborough, Ont.

Mr. Monds, of the firm of Clarke & Monds, Limited, Toronto, contractors, has arrived in the city to take charge of the general construction work of the new power development house near Auburn. The work consists of a new canal on the west bank of the river, and a new power house just above the railroad bridge on the Lakefield branch.

St. Vital, Man.

The Rural Railway Company (Jos. Bernier, Secretary, Manitoba), is stated to have applied to the municipal council for a franchise to build a five mile electric railway from either Winnipeg or St. Boniface to St. Vital. Chas. E. Lewis, Minneapolis, Minn., president.

Toronto, Ont.

See "Business Buildings."

The Hydro-Electric Power Commission has decided upon further development and has applied to the Electric Power Company interests which control the power production of the Trent Valley for power to be supplied in Cobourg, Whitby and other towns in the Midland district.

Victoria, B.C.

Additional street lights as recommended by the electric light commissioners have been approved by the city council.

A. T. Goward, local manager of the B. C. Electric Railway Company, announces that a location line of the proposed Saanich extension will be run at once.

Winnipeg, Man.

Tenders addressed to M. Peterson, secretary, Board of Control, will be received until October 20th for construction of concrete foundation on the site of substation No. 1 on King street. Details, etc., at office of power engineers, Smith, Kerry & Chace.

The Provincial Government may be approached as to the advisability of undertaking the electric power question and evolving a scheme similar to that of the Hydro-Electric Commission of Ontario.

AWARDED.

Tillsonburg, Ont.

Tenders for erection of hydro-electric power house were received from Tillson Company, for $1,200 (accepted); W. Ferguson and Thos. Fern, $1,325.

Winnipeg, Man.

The tenders for excavations for the power substation on King street have been let to George W. Vincent at $1,584, work to be commenced at once.

Miscellaneous

Brandon, Man.

Recent building permits include: A. Harrison, frame residence on 11th street, $2200; M. H. Cook, frame residence on 12th street, $2,000; H. G. Fletcher, frame residence on 13th street, $2,200; J. Van [illegible], addition to hotel on 6th street, $3,000.

Hamilton, Ont.

The following building permits have been issued: W. H. Northcott, brick dwelling, Mount Royal avenue, near Orchard Hill, $2,500; M. Levy, six veneered dwellings, Sherman avenue, near [illegible] street, $12,000; A. J. Fadyen, three frame dwellings, Beechwood avenue, east of Sherman avenue, $2,600; F. H. Hall, cement block drug store building, and doctor's office, King and Arthur avenue, for Dr. A. Davis, $2,500; William Sparks, brick dwellings, Fairleigh avenue, between Delaware and Cumberland avenues, $2,500; Robt. Clohecy, brick store and apartment building, Barton street, corner James street, for M. Cummings, $8,000.

Montreal, Que.

O. Marin, 149 Ontario street east, three houses containing nine dwellings on Cuvillier street, $7,500; O. Briere, 686 Letourneau street, house containing nine dwellings on Esplanade avenue, $3,000; A. Lafleur, 233 Papineau avenue house containing four dwellings on Christopher Colomb street, $3,000; L. Sauve, 109 La Salle avenue, two houses containing four dwellings on Leber street, $6,000; H. Dufresne, 368 Clark street, two houses containing six dwellings on St. Dominique street, $9,000; M. Tessier, Cedars, two houses containing six dwellings on Parc G. E. Cartier, $6,000; W. Pitre, 211 Bourbonniere street, three houses containing nine dwellings on Stadacona street, $6,600; S. Contin, 1170 Dufferin street, two houses containing four dwellings on Chambord street, $3,000; Perreault & Audy Co., Ltd., 992 St. Urbain street, two two-storey houses on Roy street, $5,000; Miss MacPhearson, Esplanade avenue, a two-storey house on Hutchison St., $4,900; C. E. Lamoureux, 171 Marquette St., house containing six dwellings on Parthenais St., $5,000; G. Gregoire, 1011 Cadieux street, house containing three dwellings in Cadieux street, $3,000; Mayrand & Mayrand, 44 St. Vincent street, house containing four dwellings on Duquette street, $3,500; Melle. Y. Clement, 176 Laval avenue, house containing store and dwelling on Roy street, $3,000; D. Riopel, 527 Rachel street, two house containing six dwellings on Colonial avenue, $7,000; Los. Deslauriers, 2nd avenue, Emard Ward, two houses containing six dwellings on 2nd avenue, $6,000; Marie E. Belanger, 1 Boulevard St. Joseph, a two-storey house on St. Joseph Boulevard, $2,500; L. Gill, 646 Casgrain street, house containing three dwellings on Casgrain street, $2,500; Jos. Gareau, 531 Fullum street, house containing six dwellings on Parthenais street, $4,000; Wong You Ark, 50 Lagauchetiere street west, alterations to property to cost $6,000; H. Deguise, 2029 Ontario street east, house containing four dwellings at 408 St. Germain street, $3,000; A. Carriere, 131 Cuvillier street, house containing four dwellings on Cuvillier street, $3,000; Montreal & Southern Counties Railway, Canadian Express Building, a depot McGill and Youville streets, $3,000.

Toronto, Ont.

Recent building permits include: Dr. Clarkson, three two-storey and attic brick dwellings, near Concesvalles, on north side Constance, $7,600; W. N. McEachren & Son, one pair semi-detached two-storey brick dwellings, at 46-48 Wineva, $4,000; John Beers, one pair semi-detached two-storey brick dwellings, near Defoe, on east side Walnut, $4,000; W. W. Hiltz, five detached two-storey brick dwellings, on northeast corner Carlaw and Dingwall, $10,000; [illegible] Salvador Brothers, three attached two and one-half storey brick dwellings, near [illegible] street, on east side River, $12,000; Mrs. Elizabeth Dickey, two-storey and attic brick dwellings near Geoffrey, on west side Sunnyside, $4,500; F. Waite, three attached two-storey brick dwellings, near [illegible], on south side [illegible]; [illegible] brick store and dwelling, southeast corner Royce and Symington, $4,000; F. N. MacQueen, one pair semi-detached two and one-half storey brick dwellings, on Manning avenue and Palmerston Gardens, $4,600; N. J. Craig, three attached two-storey brick dwellings, near C. P. R., on west side Albany, $5,600; Lurie & Alexander, one pair semi-detached two-storey brick dwellings, near Dundas, on west side Norfolk, $4,000; F. G. McBrien, one pair semi-detached two-storey brick dwellings, near Kingsley, on Laughton avenue, $4,000; Lavine one pair semi-detached two-storey and attic brick dwellings, on 353-355 Bathurst street, $6,000; J. W. Walker, four attached three-storey brick stores and dwellings, northwest corner Bloor and Concord, $12,000; Geo. Sparrow, four pairs semi-detached two-storey brick dwellings, near Queen street, on Empress crescent, $16,000; Sharp & Urquhart, one pair semi-detached two-storey brick dwellings, on 47-49 Perth, $5,600; Miss [illegible]rinch, two-storey and attic brick dwelling, on Wychwood Park, $6,000; E. J. Cannon & Sons, one pair semi-detached two-storey brick dwellings, on 360-2 Margueretta, $4.400; John [illegible]heller, one pair semi-detached two-storey and attic brick dwellings, near Conduit, on east side Sinclair, $4,600; Moore Bros., four detached two-storey brick dwellings, near Vaughan road, on Ellsworth avenue, $8,000; F. Campbell & Co., one pair semi-detached two-storey brick dwellings, on 1055 Shaw, $4,000; Johnston & Zinke, two detached two and one-half storey brick dwellings, near Medland, on south side Humberside, $6,000; N. J. Craig, two pairs semi-detached two-storey brick dwellings, near Dupont, on west side Albany, $8,000; G. H. Gooderham, two-storey brick garage, on 204 St. [illegible]eorge street, $9,000; Ontario Wind, Engine & Pump Co., two-storey boiler and paint room, southwest corner Liberty and Atlanta, $6,000.

Winnipeg, Man.

Tenders addressed to the Chairman, Board of Control, will be received until October 21st for supply of 600 feet of 2½ inch double jacketed cotton rubber-lined hose in 50 foot lengths. Specifications at office of city engineer. M. Peterson secretary.

AWARDED.

London, Ont.

Tenders for supply of water meters were received from the following: Hersey Company, the Trident Company, the Thompson Meter Company, the National Meter Company, and the Neptune Company, all American firms. The meters were all quoted the same, from $8.40 to $50 each. One hundred ⅝-inch meters, 50 ¾-inch, 25 1-inch and 12 2-inch meters were required. The order was divided between the National Company and the Trident.

Toronto, Ont.

President George H. Gooderham has let the contract for the new fountain he is presenting to the Canadian National Exhibition to a London, Eng., firm. The fountain is to be made of Carrera marble, and will be a replica of the famous fountain designed by Michael Angelo, now in front of the Church of St. Peter's, at Rome. The contract calls for the work to be completed [illegible] The cost will be in the neighborhood of $8,000.

Vancouver, B.C.

At a sum approximating $80,000, the contract for nearly seven miles of dyke that will reclaim a large portion of [illegible]

Whitewash for Concrete Surfaces

Common whitewash has been used on concrete surfaces, particularly of residences and small buildings, in order to give a white, rather than the gray, cement tone. It is frequently lacking in durability, however, and the "Cement Age" therefore suggests that better results where greater adhesion is desired may be obtained with the whitewash used by the Government on its lighthouses. The following formulas for whitewash and cement wash have been furnished to the above journal by the Department of Commerce and Labor. The formula for whitewash, the Department states, has been found by experience to answer on wood, brick and stone nearly as well as oil paint, and is much cheaper.

Whitewash.—Slake half a bushel of unslaked lime with boiling water, keeping it covered during the process. Strain it and add a peck of salt, dissolved in warm water; three pounds of ground rice put in boiling water, and boiled to a thin paste; half a pound of powdered Spanish whiting, and a pound of clear glue, dissolved in warm water; mix these well together and let the mixture stand for several days. Keep the wash thus prepared in a kettle or portable furnace, and when used put it on as hot as possible with painters' or whitewash brushes.

Cement wash for the outside of lighthouse towers.—Take of fresh cement 3 parts, clear sand 1 part, and mix them thoroughly with fresh water. This will give a gray or granite color, dark or light, according to the color of the cement. If a brick color is desired, add enough Venetian red to mivture to produce that color. The cement, sand and coloring matter must be mixed together. If white is desired the walls, when new, should receive two coats of cement wash and then whitewash. After the work has received the first coat a single coat every three or four years will be sufficient. It is best to thoroughly dampen the wall with clean, fresh water, and follow immediately after with the cement wash. This course will prevent the bricks from absorbing the water from the wash too quickly and will give time for the cement to set. Care must be taken to keep all the ingredients of the cement wash well stirred during the application of it. The mixture must be made as thick as it will admit of to be conveniently put on with a whitewash brush.

Paint and Waterproofing for Concrete

Some analyses have been made on a series of compounds widely advertised for use in waterproofing, strengthening, or decorating concrete. Among the materials contained were stearic acid compounds, gums, waxes, soaps, mineral chlorides, inert pigments, and asphalt derivatives. Much interesting information is given regarding the composition of such compounds, although the names of the particular compounds are not given.

The possibility of ultimate deleterious effects on concrete from the use of these internal waterproofing materials is a subject for joint study by engineers and paint chemists. In addition to proving the advantages of such materials as water excludes, it should be determined whether they may corrode the steel used in reinforcing concrete, and whether they may affect the set and tensile strength of the cement itself.

It is particularly the province of the paint chemist to study the subject of paint coatings for concrete. Oil coatings have been found to be badly affected by the free lime present, which causes sponification and subsequent solution of the saponified coating. The porosity of cement or concrete surfaces causes an absorption or suction effect that renders it necessary to apply to a given area three or four times as much paint as would cover an equivalent area of wood. Two very important lines of investigation are therefore suggested, the neutralization of the free lime in the cement of the pores of the concrete in order to prevent the suction of any paint that may be applied later.

One suggestion that promises to be of great importance in both of these lines has been made by Charles Macnichol, a master painter, of Washington, D. C. Macnichol suggests that a solution of zinc sulphate and water mixed in equal parts by weight (8 pounds zinc sulphate to 1 gallon of water), be used as a priming coat. When applied to concrete surfaces a reaction between the zinc sulphate and the free lime takes place, in so far as the material penetrates the concrete. The products of this reaction are calcium sulphate and zinc hydroxide. There is thus precipitated between the pores of the concrete two practically insoluble pigments, both natural, and these tend to fill the voids and pores and thus to lessen the suction properties of the concrete, besides having neutralized the free lime in the cement. After the application of this priming coat, oil coatings may probably be applied with good results, although whether an excess of zinc sulphate in this treatment may do any harm has not yet been determined. Other treatments have been suggested, but most of them have been found defective or else too expensive.

An annual increase of from $35,000 to $40,000 in the wages of laborers in all branches of the Works Department is predicted by City Engineer Rust, of Toronto, in a letter to the controllers, recommending that the men in the waterworks branch be raised from $2 to $2.25 per day. He intimates that if this is done a general increase in all other branches should naturally follow.

For the first nine months of the year the aggregate value of buildings erected at Victoria, B. C., was $1,837,625, compared with $1,443,295 for the corresponding period last year. The total for the whole twelve months last year was $1,673,425, which means that the present year establishes a new record in building figures. The total value of buildings for which permits were issued during September was $199,686, compared with $140,935 for the same month a year ago.

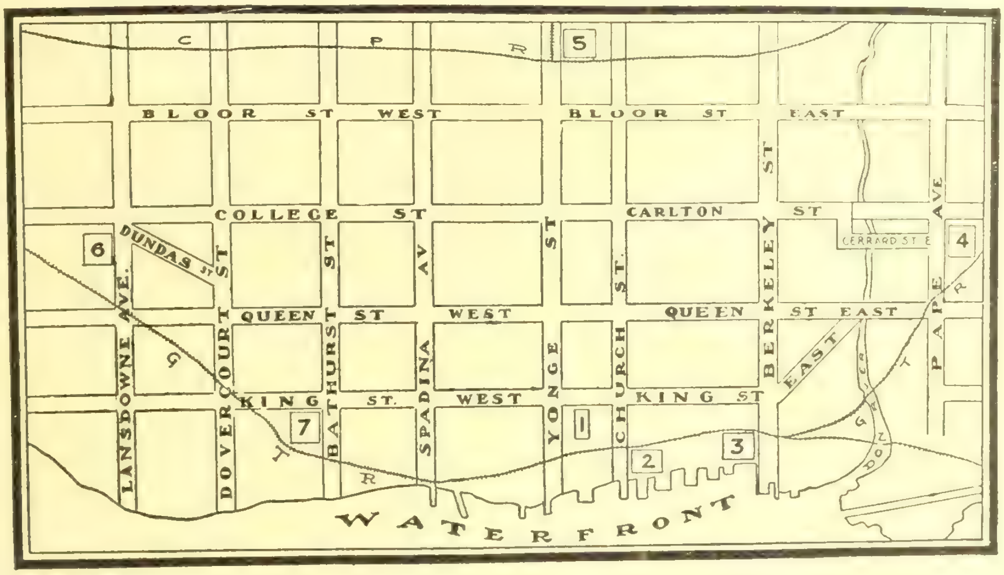
Construction has commenced at Woodstock, Ont., on the new plant of the Canadian Linderman Company. The company have a capital of $160,000. They will manufacture the Linderman Automatic Dovetail Glue Jointer. This machine is one of the most interesting inventions that has ever been made in connection with the woodworking industry. An instructive booklet may be obtained on application to the Linderman Machine Company, of Muskegon, Mich.

A firm of English contractors recently made a proposition to rebuild Messina, Italy, according to plans which had been approved by the government, to clear the streets and to negotiate a loan of $120,000,000 to the municipality at 3½ per cent. interest. The reconstruction of the city, it was estimated, would take five years' time. The proposal was later on referred to the municipal authorities, who rejected it. A representative of the English firm was summoned to Messina, and had an interview with two influential citizens, who informed him that if the firm was willing to pay them, the citizens, they would have the proposal accepted. The agent asked them what sum they wanted. One said he was willing to accept $20,000, but the other insisted upon a 2 per cent. of the value of the contract. The agent returned to Rome, and asked the Minister of Public Works whether it was the custom in Sicily to bribe the officials. The Minister was highly indignant, and the case will be brought up in Parliament. Meanwhile, however, the two citizens are suing the agent of the English firm for slander. The ruins still remain as they were on the day of the great earthquake.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5



No's
2,
4,
5,
6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is
PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

CONTRACTORS' PLANT

BOILERS

PUMPS

TANKS

CONDENSERS

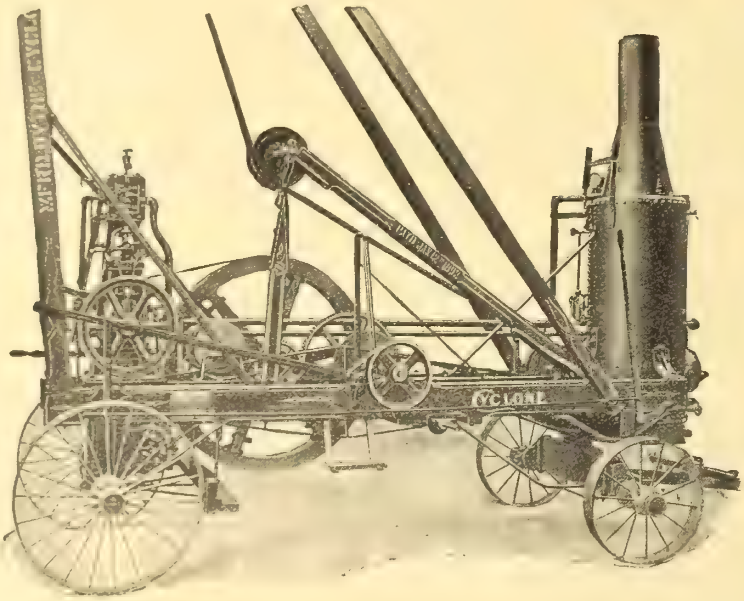
WORKS, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

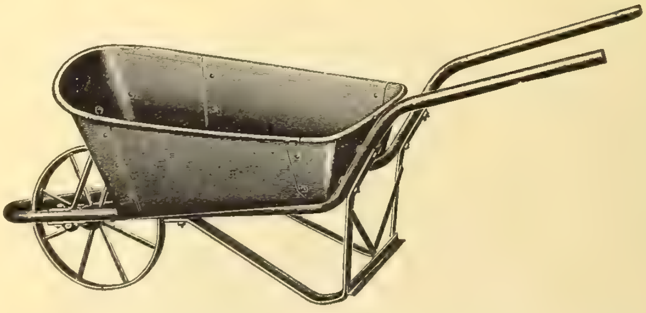
Limited

Cyclone Drills

for Blast Hole Drilling, Well Drilling, Prospectin



Fully Illustrated
Catalogue on
application

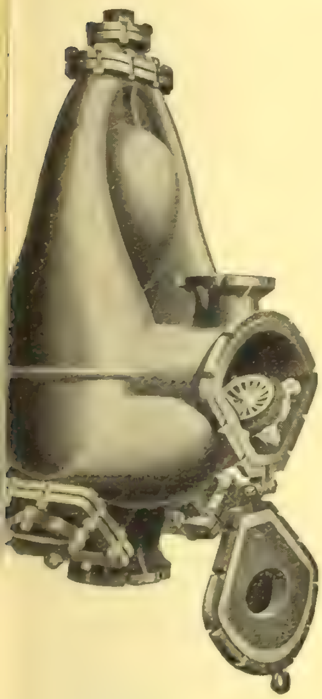


WHEELBARROWS for all purposes in stock

Head Offices and Warehouses :
Montreal

MUSSEN

ulsometer Steam Pumps



No Pistons, Rods, Glands or other moving parts such as these which get out of order so easily. Only a simple Ball Valve and two Ribbon Flap Valves.

Pump dirty and gritty water to perfection.

Simple - Durable - Convenient - Economical.

NORTON JACKS in stock

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's Liquid Rubber Cement

This material is of the consistency of putty and is especially intended for filling expansion joints. To waterproof same and take care of expansion and contraction in concrete construction.

Specification:

Have joints dry and clean, apply a coat of LIQUID RUBBER and follow with LIQUID RUBBER CEMENT, packing same firmly into the joints by means of putty knife.

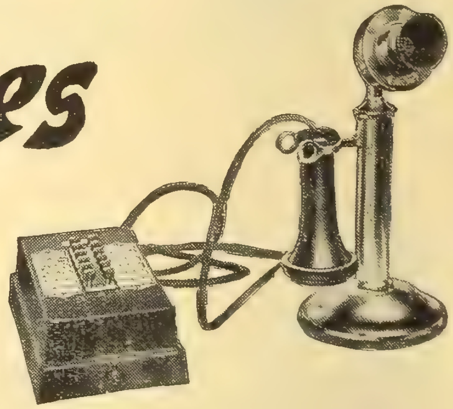
Level off the surface and apply a finishing coat of LIQUID RUBBER. LIQUID RUBBER CEMENT if too heavy can be reduced with LIQUID RUBBER.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio
Distributed in Canada by
Stinson-Reeb Builders Supply Company **Eastern Townships Bank Building**
Montreal, Quebec

THE NORTHERN ELECTRIC AND MFG. CO. LIMITED · FIRE ALARMS · TELEPHONES SUPPLIES

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.



No. 2016 – Type-Metal Inter-phone for desk use

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.

HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative

WINNIPEG - Telephone 224 - 404 Travellers' Bldg
J. R. HOOPER, Representative.

VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative

CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative

LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto October 19, 1910 No. 42

Is Day Labor Increasing in Popularity ?

For some little time a discussion has been carried on in these columns relative to the city engineer's estimate. There have been a number of good points made by writers on both sides of the question. The contractors claim that if the city engineer is to bid against them he should be compelled to figure under the same restrictions as they. Further, it has been said that work carried out by day labor is unsatisfactory on account of less stringent supervision and the opportunities favoring the engineer or his foreman. It is also claimed that the patronage evil is developed under this system.

On the other hand a well known municipal engineer of wide experience and an unsullied reputation in contracting circles, writing in our last issue, contends that all these views are biased and that scamped work or the use of inferior material by the city are remote possibilities. The impression is made that the day labor system is *increasing in popularity*. "There is no doubt," says the writer, "that the engineer, when properly equipped with plant, can successfully compete with contractors, and make money for the municipality."

For our own part, we do not doubt the integrity of the city engineer or his good intentions by the city, but the increase in popularity of day labor is news to us and we certainly think that in ninety-nine cases out of a hundred the efficient and economical carrying out of a project is better in the hands of an experienced contractor. The day labor system is generally far more expensive, owing to the fact that nobody in particular is concerned with seeing that the work is carried out upon the most strictly economical lines; and as to supervision, it cannot be as strict under the day labor as under the contract system, for it is opposed to the weakness of human nature to expect the same care to be taken of the city's funds as of one's own.

Then there is another aspect of the case which favors the contractor. The latter has a reputation to make and it is in his interests to do his best by the work, so that should a larger contract be among the possibilities it might be said that he had carried out his previous work satisfactorily and economically. Reputation is a part of the contractor's stock-in-trade. One not infrequently hears of a contractor, who has carried out satisfactorily a large work for a municipal body, being given another contract even though his tender be slightly in excess of his competitors.

Again, the men employed by a contractor are generally trustworthy and competent. Frequently they remain with the one employer for a long period and become conversant with all the details of his work. Municipal authorities are not situated so favorably. They are not so closely in touch with the men as the contractor and they have to take greater chances on incompetence.

These are only a few phases of a subject which is somewhat familiar, but its vital importance to contractors is not lessened by its familiarity. If there are any fresh aspects from which the case may be viewed or any further arguments or suggestions that have not yet been propounded it will be instructive to discuss them. A number of interesting letters that we have already received in this connection are held over for our next issue.

Arrangements for Next Season's Work

The folly of postponing until the last minute the arrangements for municipal work contemplated for the season is admitted, and yet, year after year, the same mistake is made in many sections of the country. It is a frequent thing for a couple of months of good working weather to be wasted through the dilatory procedure of the municipal authorities. This sort of thing is directly opposed to the best interests of the town or city and renders i impossible in most cases for the contractor to do ample justice to the work. All preliminaries should be settled in the fall so that construction can start at the first opportunity. It is well to make good headway early in the season, not only in the interests of construction, but also for the reputation of all concerned. The City of Montreal is setting a good example in this connection. The authorities there are determined not to have a repetition of what occurred this season. The contracts for permanent works to be undertaken in 1910 were not passed by the Montreal city council until May 19. A spell of rainy days following this date it was impossible to do much until the middle of June. In the case of the present season, this was a clear waste of three months' good working weather. Last week the Montreal Board of Control adopted the following resolution, which should commend itself strongly to Canadian municipalities generally:

"Resolved that the secretary be authorized to write at once to all the aldermen, asking them to submit in writing before November 15, a summary of all the improvements and permanent works they think are necessary in the public interest and particularly in the interest of their respective wards, so that the board shall be in a position to prepare its programme for next year, it being the intention of the board to prepare all formalities necessary and submit to the council for its approbation, the contracts for permanent works in the months of December and January, so as to be in a position to begin these works at once upon the opening of the season."

The Engineer as Sole Arbitrator

Edmonton, Alta., Oct. 12, 1910.

Editor "Contract Record":

Referring to your editorial on the above subject, published on page 35 of your issue of Sept. 28th, I agree that a specification should be definite and exact. It should define and specify as exactly as possible the quality of the work that will be required. It should, as fas as it is possible to do so, eliminate all features of uncertainty.

It is doubtful whether any person not occupying a neutral or judicial position should be empowered to make a final decision from which there is no appeal. The right of appeal is one of the essential features of British justice and this clause in the engineer's specifications is now very frequently replaced by one such that in case the contractor is dissatisfied with the engineer's decision, he may appeal, in which case the engineer has the right to appoint one arbitrator, and the contractor one, these two appointing a third, the decision of such body to be binding on both parties.

Although I believe in a fair and reasonable specification, yet I think that it should place sufficient power in the hands of the engineer to obtain a good job or at least such class of work as the plan and specifications obviously call for. More cannot reasonably be accepted and less should not be accepted. I am strongly of the opinion that the gambling feature should be eliminated, as far as possible, from a contract, as where this factor is present the contractor may receive more for his work that he should, or he may receive less than he should. In either case it is wrong. For example there may be work where the character and quantity is uncertain and it is wrong to ask for a lump sum bid on the work. It should be a unit price bid, the work being so classified that the contractor may tender so as to obtain a fair and reasonable price for the work done. This is fair to both parties. It has been said that the best bargain is one in which both parties are satisfied. In like manner the contract is best where it is fair to both parties.

Yours truly,
A. J. Latornell,
City Engineer.

American Plans for Canadian Work

Commenting upon the above subject the American Architect says:

Whether there is any connection between the reports in the Canadian newspapers that a heavy import duty is to be placed on the services of American architects (not merely on their drawings, as at present), and the reported seizing, by the customs authorities of Montreal, of the drawings of a firm of American architects having a large field of operations in Canada cannot, of course, be surmised, but the fact remains of a free intercourse between the Dominion and the United States, its application, as far as the architectural profession is concerned, appears to work out too much to our advantage to meet professional approval in the Dominion. While Canadian architects may practice without restraint in all States except where a license is required of all architects, they do not avail themselves, to any extent, of the privilege, while the Americans have recently had a very fair share of the important Canadian work other than that of the Government, where their chances are not equal to those of English and of local practitioners. The situation is interesting and its outcome will be awaited with interest by the profession at large and with special concern by those whose interests are directly involved. It is, of course, surprising that the Canadian architectural bodies should invoke the special protection of the Government instead of being willing to remain on even terms with their American brethern, allowing the law of the survival of the fittest to govern.

An Estimating Class at Toronto

A class in estimating is again being formed at the technical High School, Toronto.

Expressions made at various conventions of architects and contractors point very forcibly to the fact that for the benefit of all concerned it is necessary to improve in some way the present system of tendering.

The contractor of the present day has in many instances spent many years of his life in acquiring experience, which can be secured at the school in a comparatively short period.

Previous to taking up the exercises in estimating, students should take up the studies of the other classes which will enable them to grasp readily the reading of plans, building construction, etc., and give them a knowledge of the necessary mathematics.

It is noteworthy that other bodies of commercial men look well into the product of the Technical School and it is to be hoped that the business section of the building will do the same. We feel sure that Mr. Kirkland, who is in charge of the Arts Department, will be very pleased to receive suggestions from parties interested in the success of the class.

The Belgian Association of Contractors for Masonry and Reinforced Concrete Works advises its members to stipulate that payments be made in cash on account as to the work advances; that no complaint be entertained after a fortnight from sending in the invoice; that interest at 6 per cent. be charged on all payments in arrear; and that no orders be given to workmen or sub-contractors by the person for whom a contract is being carried out during its execution.

It is possible that the greatest campaign for good roads ever organized in the Dominion will be inaugurated shortly in Manitoba. The executive of the Manitoba Good Roads Association will ask the Government to set aside $500,000 to aid in the work. Upon the basis that the Government is to bear one-third of the expense of road construction, this means that the amount will cover the expenditure of $1,500,000 for road improvements throughout the province.

Considerable dissatisfaction has been expressed at Victoria, B. C., over the city's practice of awarding contracts on alternative tenders after calling for bids on a standard specification. The unfairness of this is emphasized by the representative of the Bitulithic Paving Company, who wishes to figure on the city work, but is unable to ascertain what are the scepecification for asphalt. A discussion anent this matter was closed by the mayor, who stated that the city would not be exploited by patent paving concerns. This is all very well, but "patent paving concerns" are not to be discriminated against. They are entitled to the same chance in the contracting field as their competitor, and certainly to be acquainted with the conditions of entry and the necessary information for figuring.

Attention has very properly been directed to the fact that the Ottawa Improvement Commission is laboring under a great disadvantage by carrying on its work without having a definite plan that will insure this work being properly correlated to that which will be done twenty years hence. Montreal and Toronto can also profit in this connection. It is ridiculous to spend an eternity of time in discussing improvements if the objective is not the appointment of experts to work in conjunction with a properly constituted commission.

Mr. Henry Vivian, M. P., on Civic Improvement

Mr. Henry Vivian, M.P., for Birkenhead, England, addressed a meeting of the Canadian Club at Toronto, on the 13th inst. The speaker made a plea for the establishment of a central body to regulate the work of improving the city, having in mind the conditions that will obtain fifty years hence. He gave it as his opinion that mistakes made in development work at Toronto and Montreal will eventually cost the cities many millions of dollars. Mr. Vivian said that the west had a comparatively clean slate in this respect, but on one city, where in twenty years there will be a population of 100,000, the main street is only 66 feet wide. The speaker denounced the system of electing councils for one year, as it gives the members no continuous opportunity to study the development problem.

On the evening of Oct. 13th, Mr. Vivian addressed a large audience in the Physics Building at the University of Toronto. This meeting was presided over by Sir Edmund Walker. Mr. Vivian showed a number of interesting views and spoke of what England had accomplished in the establishment of "garden cities." The tendency in the United States had been to substitute the tenement for the home. This, the speaker contended was putting the home life of the workman on a factory basis and would crush out much of the best of the Anglo-Saxon character.

Ontario's First Delivery of Hydro-Electric Power

Tuesday, Oct. 11th, marked the first delivery of electrical energy generated at Niagara Falls, at the municipal power plant at Berlin. Details of the opening by Sir James Whitney and Hon. Adam Beck, chairman of the Hydro-Electric Power Commission of Ontario, will be familiar. The transmission line is now practically ready to serve thirty-four municipalities and there is a probability that it will be further extended to Windsor. Its cost, which was estimated at $3,500,000, will be about $3,300,000. Of this sum the principal items will be: Transmission line, $1,270,000; right of way, $400,000; transformer stations, $1,200,000; distributing lines, $150,000; insulators, $160,000. Two-thirds of the towers are now in place, the sub-stations are all practically completed, and the municipal systems are all in course of construction.

The Commission made a contract in November, 1908, with the McGuigan Construction Company, for the erection of a transmission system at a cost of $1,270,000. The chief engineer of the Commission is Mr. P. W. Sothman, under whose supervision the whole work is being carried out. We understand that a very complete description of the whole system will be published in the November issue of the Canadian Electrical News.

One of the features of the Provincial Fair, held recently at Halifax, was an exhibit of road-making machinery made by the Provincial Road Department. Various kinds of piping, etc., were also shown, as well as a number of plans and drawings illustrating standard forms of roadways. Further interest was stimulated by a practical demonstration of the construction of improved macadam, gravel and clay roads. The importance of ditching and crowning was emphasized. Painting materials used in preserving the steel bridges of the province were shown.

Bonding New Concrete to Old

In discussing the question of bonding new concrete to old, a writer presents the following suggestions:

Clean off with clear water and stiff broom the surface of the old concrete. Mix one part commercial muriatic acid or hydrochloric acid and four parts water, make several applications one after another with a brush containing little or no metal. This will not injure the concrete, as the acid does not sink to a sufficient depth before it is neutralized.

After applying the acid, wash the surface with clear water, scrubbing with a stiff broom or brush, removing all the dead particles. While the surface is still wet (and it should be thoroughly wet), apply the new concrete. Protect this new concrete by keeping it damp for at least a week. Do not let it dry out at any time during the first week.

It will be found that the new concrete will bond to the old as strongly as if both had been mixed at the same time.

Freezing Process of Tunnelling

In giving a most interesting description of the methods adopted for the crossing of the River Seine by line No. 4 of the Chemin de Fer Metropolitain in Paris, an engineering correspondent of The Times goes on to speak of tunnelling by the freezing process.

The most hazardous part of the work was that in front of and beneath the Bas-Port of the Quai St. Michel and under the station of the Orleans Railway. Owing to the proximity of the river bed, the water-bearing nature of the soil, and the risk of disturbing the foundations of the Bas-Port and the railway station, it was decided to construct this portion of the tunnel by the freezing process. It should be mentioned that before the beginning of the tunnel the Orleans Railway station had been very securely underpinned by foundation walls sunk to such a depth as to render the structure independent of any possible disturbance caused by the operations about to be undertaken by the Metropolitain Railway.

The area to be frozen beneath the river was enclosed by a timber cofferdam backed with clay, the object of this structure being to check currents which would have made thorough congelation of the soil very difficult. The heterogeneous material to be traversed comprised 1.80 metres of mud, 3.70 metres of quicksand, 2.29 metres of marl, and 2 metres of solid rock, the mean temperature being 10° C. The volume of earth to be frozen was about 2,150 cubic metres, one-third of this being estimated to consist of water. For the reception of the circulation pipes sixty holes, 17 metres deep, were bored, fifty-one inside the cofferdam and nine along the Bas-Port. The freezing circuits were formed of flanged pipe at 134 mm. internal diameter, with an inner tube of 35 mm. internal diameter, this tube being open at the lower end and constituting the flow pipe. The brine consisting of calcium chloride solution with a density of 1.25, flowed through the inner pipes at the velocity of 70 cm. per second and through the outer pipes at the velocity of 4.9 cm. per second.

Cold brine was supplied from two freezing installations, the plant in each case including compound [illegible] machines on the Linde system. The average temperature of the brine was —21° C. in the flow pipe and from —20° to —22° C. in the return pipes.

Soon after the plant was set to work all exposed pipes were rapidly covered with ice to the thickness of 10 cm. by the freezing of moisture condensed from the air, this layer acting as an excellent insulating medium. At the expiration of some forty days the earth was found to be thoroughly frozen, and a large area round the consolidated mass was reduced in temperature from 10° to 5°C. Excavation of the frozen soil was performed by means of ordinary picks. The masonry and cast-iron lining were constructed as in an ordinary tunnel, and on completion those of the circulation pipes which passed through the subway were withdrawn and the holes filled up with concrete.

An exceptionally severe test was imposed upon the freezing installation by an unexpected current of water which found its way across the old foundations of the Orleans Railway station, under the footings of the Bas-Port, and into the river. The effect of this irruption was to wash away large quantities of earth from behind the frozen mass, and to pour an enormous volume of water into the partly-completed tunnel. The quantity of water to be dealt with was far beyond the capacity of the pumps at command, and it became necessary to construct a special cofferdam to cut off the flow. While this was being done, and during the subsequent pumping to clear the works, the freezing plant was kept at work continuously in order to prevent the large flow of comparatively warm water from thawing the earth. The danger of such a result was by no means remote, and the consequences would have been most serious; and it is therefore gratifying that the freezing plant proved capable of withstanding the test in a perfectly satisfactory manner.

Design and Erection of Wilton Ave. Bridge

Noteworthy Structure over the Don River now under construction for the City of Toronto—Details of Sub-Structure

By R. E. Chadwick, Engineer of Bridges and Docks, Toronto

The city of Toronto extends along the shore of Lake Ontario for a distance of about ten miles, from the Humber river, at the west, to a point about three and three-quarter miles east of the Don river at the east. For many years there has been a constant demand for additional bridges crossing the River Don. There are in all five highway bridges crossing the Don, only two of which carry street railway traffic. These bridges are the only means of communication from that portion of the city east of the river. Prior to the year 1908 this district had an area of about three and one-fifth square miles, but during 1908 and 1909 two and one-third square miles were annexed, rendering additional accommodation necessary.

Accordingly, on January 1st, 1909, the sum of $215,000 was voted for the extension of Wilton Avenue across the Don from River street to Munroe street, a distance of 1,300 feet. The Don Valley at this point was about 800 feet wide, the natural ground level being about 25 feet below the grade of the proposed street. From comparative estimates it was found economical to fill as much of this as possible. The surplus excavation from the trunk sewer could be placed on the site very cheaply and there was sufficient of this to almost complete the fill. Thus the length of the bridge was cut to the minimum required to span the river, and the roadways and railroad properties on each side.

The profile of the ground and the natural conditions were all favorable for the economical construction of a bridge of excellent proportions and graceful lines. The bridge has a total length of 380 feet on a skew of 87 degrees 12 minutes, and a width of 54 feet, providing for a 42-foot roadway and two six-foot sidewalks. The river span is a three-hinged ribbed arch, 124 feet centre to centre of skewback pins, with a rise of 26 feet. On each side of the river there are two deck plate girder approach spans of 70 feet 6 inches and 49 feet 6 inches respectively. The two river piers, and the abutments, are of massive concrete construction reinforced for temperature only. It was the original intention to support the approach spans on small concrete piers, but these were replaced by rocker bents so as to give more clear-

Wilton Avenue Bridge.—General View of Construction from West Approach.

ance for the railway tracks. The entire bridge will be floored with reinforced concrete and paved with asphalt.

The conditions of the subsoil were peculiar. On the west side of the river, shale was found about seven feet below mean low water level, which provided an excellent foundation for the west river pier and the intermediate pedestal. The west abutment is carried down to hard blue clay, eight feet above mean low water level, except along the line of the south wing wall, where a soft spot was encountered, which made it necessary to carry the concrete about seven feet deeper.

On the east side of the river, borings were carried to a depth of 63 feet below mean water level through fine sand, but no bottom could be found. Accordingly the east river pier, the east abutment and the intermediate pedestals are carried on wooden piles cut off one foot below mean low water. The piles on the land side of the river pier, and under the toe of the abutment, averaged about 50 feet in length and were driven to a minimum resistance of 36 blows for the last foot under a 4,500 pound steam hammer, with a 40-inch stroke. This was considered ample for a load of 25 tons per pile under full live and dead load. Figured on the "Engineering News" formula, these piles should sustain a load of 70 tons each.

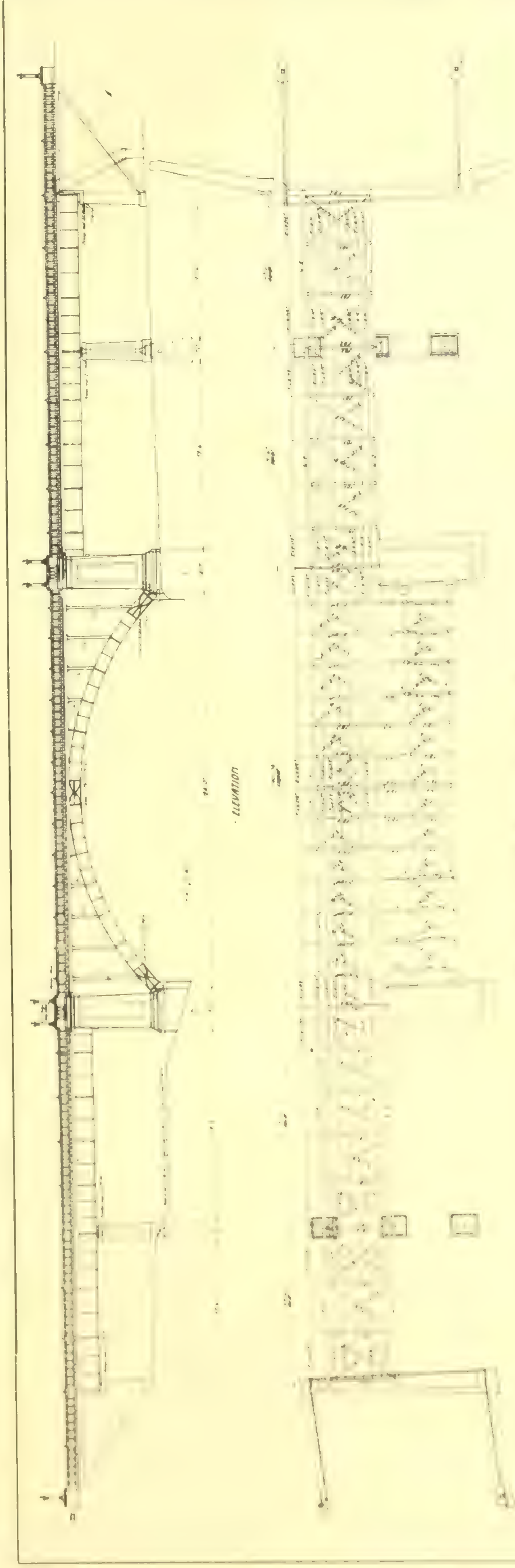
Work on the substructure was commenced on November 24th, 1909, by the city, it being considered advisable to complete everything to water level by day labor on account of the uncertainty of the subsoil. The piling and sheeting for the cofferdams for the river piers was driven by Mr. George Arbuckle under a sub-contract. "Lacawanna" steel sheet piling was used for the cofferdam for the west river pier and was driven to rock. Sixteen foot "Wakefield" sheet piling was used for the cofferdam for the east river pier. Both cofferdams were puddled on the outside with the material removed and no serious leakage occurred.

The contract for the substructure above water level was let to Wells & Gray, Limited, Confederation Life Building, Toronto. Work was commenced on May 3rd, and completed ready for the erection of steel by the latter part of August. The contractors were greatly hampered by the failure of the railways to make deliveries on materials during the Grank Trunk Railway strike, but in spite of this they made excellent progress and completed the work to the satisfaction of all concerned.

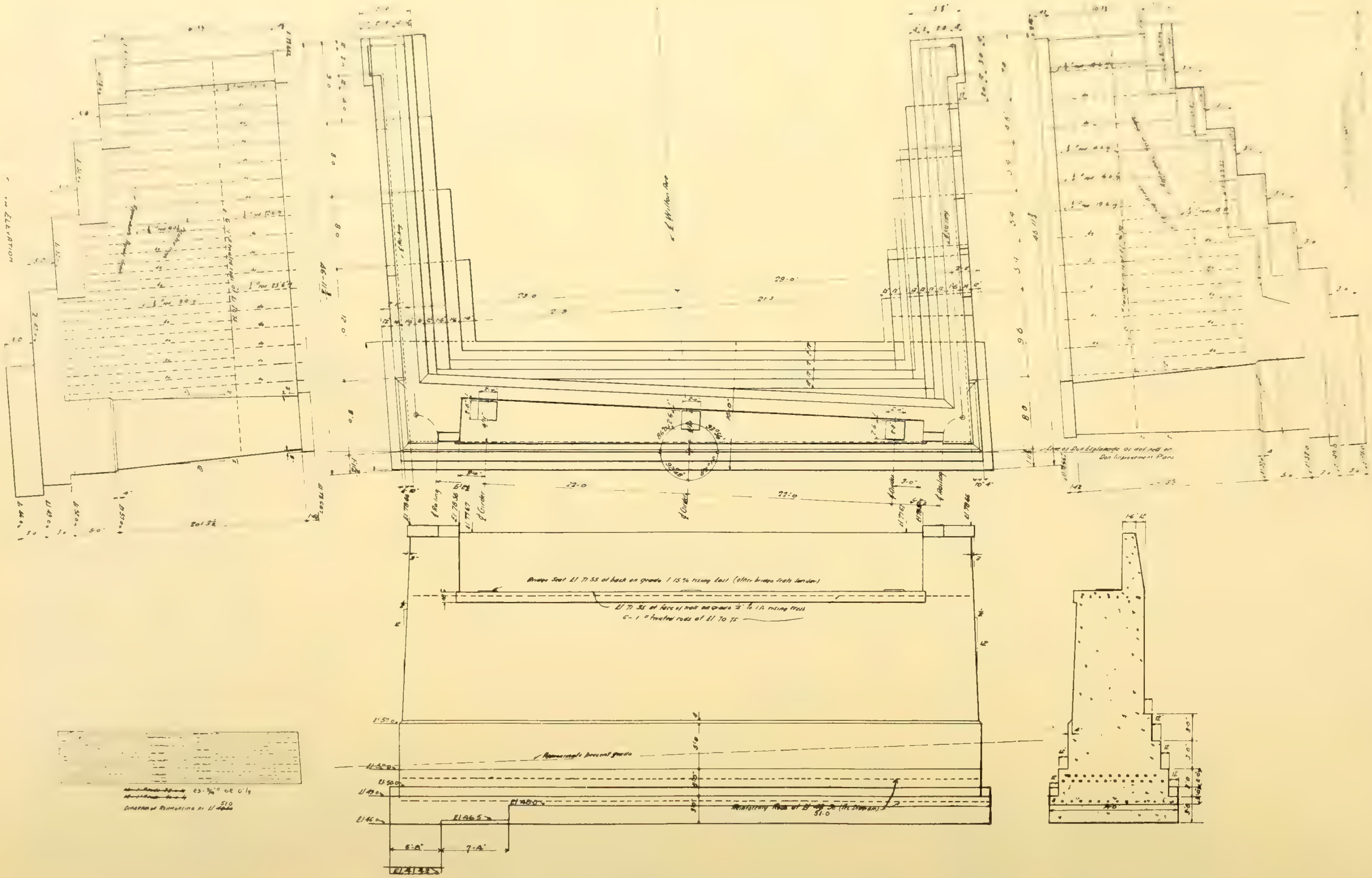
The following are the approximate total quantitites of work involved:

		Cub. yds.
West abutment	Below Elev. 16	—
	Above Elev. 16	712
		712
East abutment	Below Elev. 16	754
	Above Elev. 16	681
		1,435
River pier	Below Elev. 16	458
	Above Elev. 16	600
		1,058
Pedestals	West side of river	41
	East side of river	124
		Piles driven
Piles.—East river pier		129
East abutment		223
East pedestal		33
Total		385

The contract for the superstructure has been let to the Dickson Bridge Works Company, of Campbellford. On

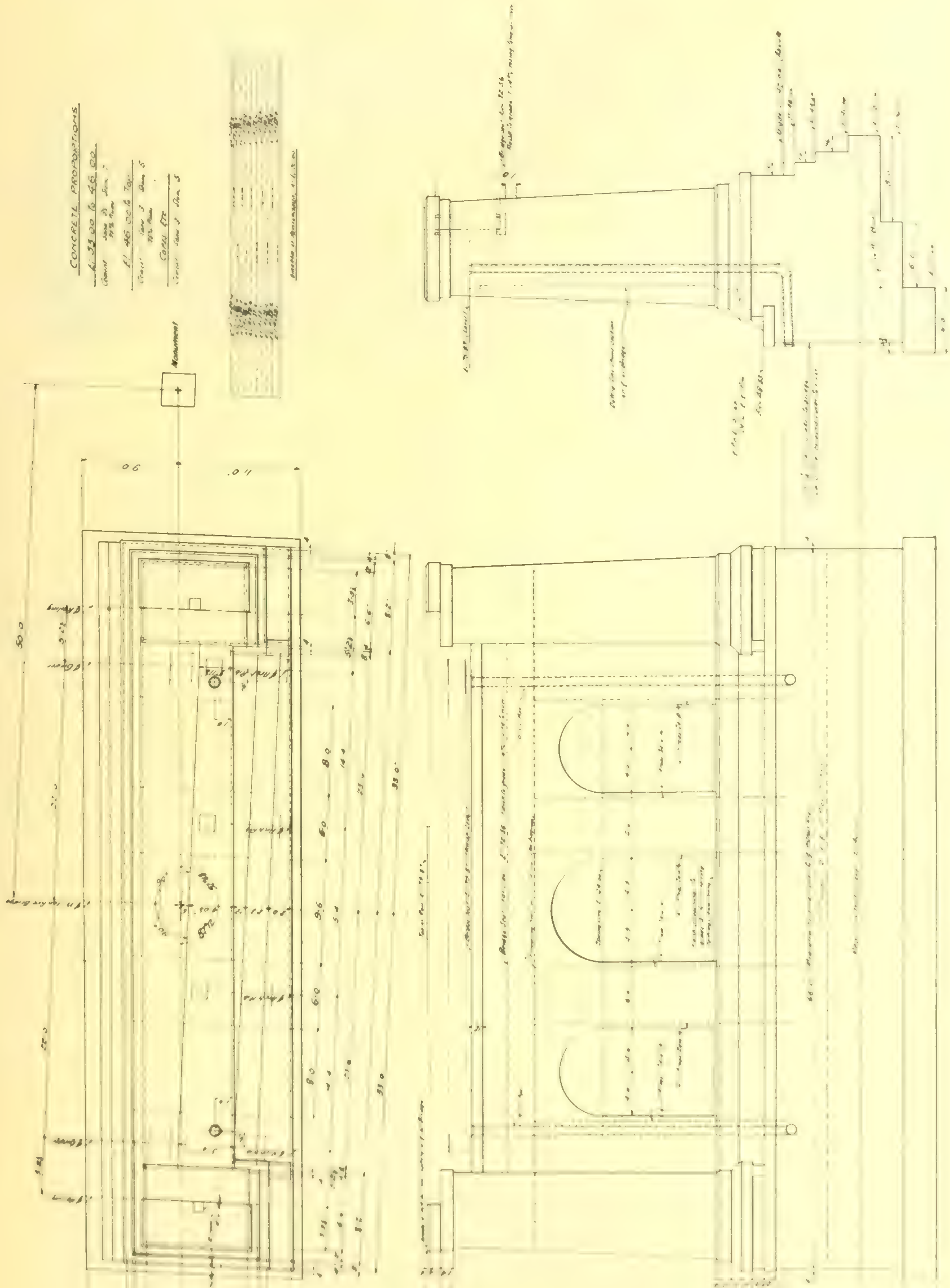


Wilton Avenue Bridge—Plan and Elevation.

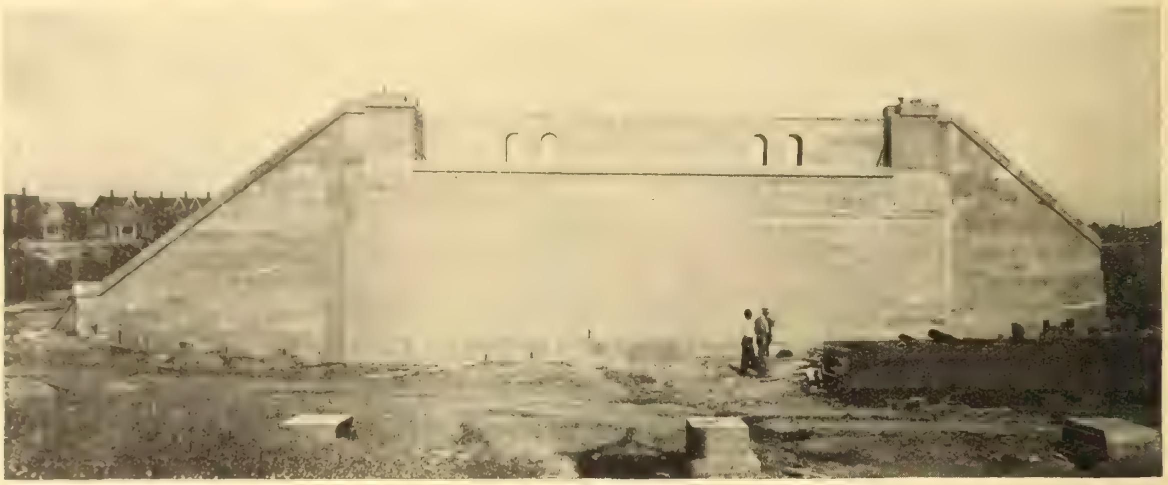


ELEVATION
℄ Wilton Ave
29·0
21·3
46-11½
22·0
22·0
9·0
℄ Railing
℄ Girder
El 78·66
El 78·36
El 77·67
Bridge Seat El 71·55 at back on grade 1·15% rising East (other bridge seats similar)
El 71·35 at face of wall on grade ¼" to 1 ft rising West
6 - 1" twisted rods at El 70·75
Approximate present grade
Reinforcing Rods at El 49·50 (see Diagram)
51·0
El 57·0
El 52·0
El 50·0
El 49·0
El 48·0
El 46·5
El 46·0
El 41·38
6·8
7·4
16·12

Wilton Avenue Bridge—Details of West Abutment.



Wilton Avenue Bridge—Details of River Piers.



Wilton Avenue Bridge—Detail of East Abutment.

tario. At the date of writing about half of the steel is erected.

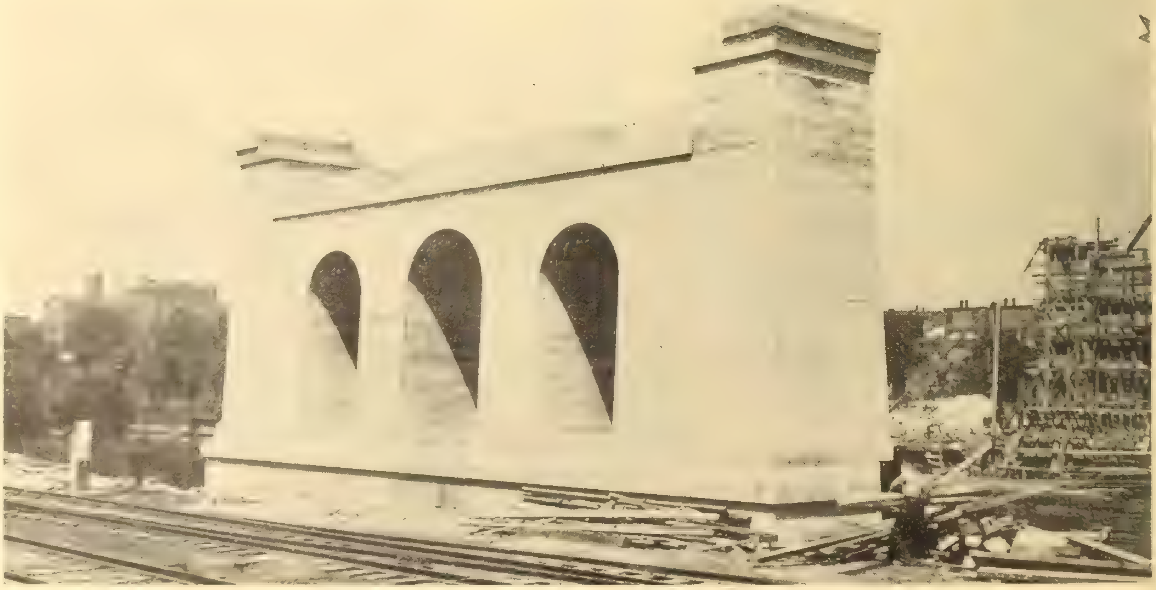
The bridge was designed and constructed by the City Engineer's Department under the supervision of the writer with Mr. G. F. Taylor, as resident engineer on the substructure, Mr. Arthur Birks, superintendent on the substructure below water, and Mr. G. Bernard, inspector on the superstructure and on the substructure above water. Mr. Gray, of Wells & Gray, Limited, superintended the construction of the substructure above water level.

Details of the superstructure will be given in a later issue of the Contract Record.

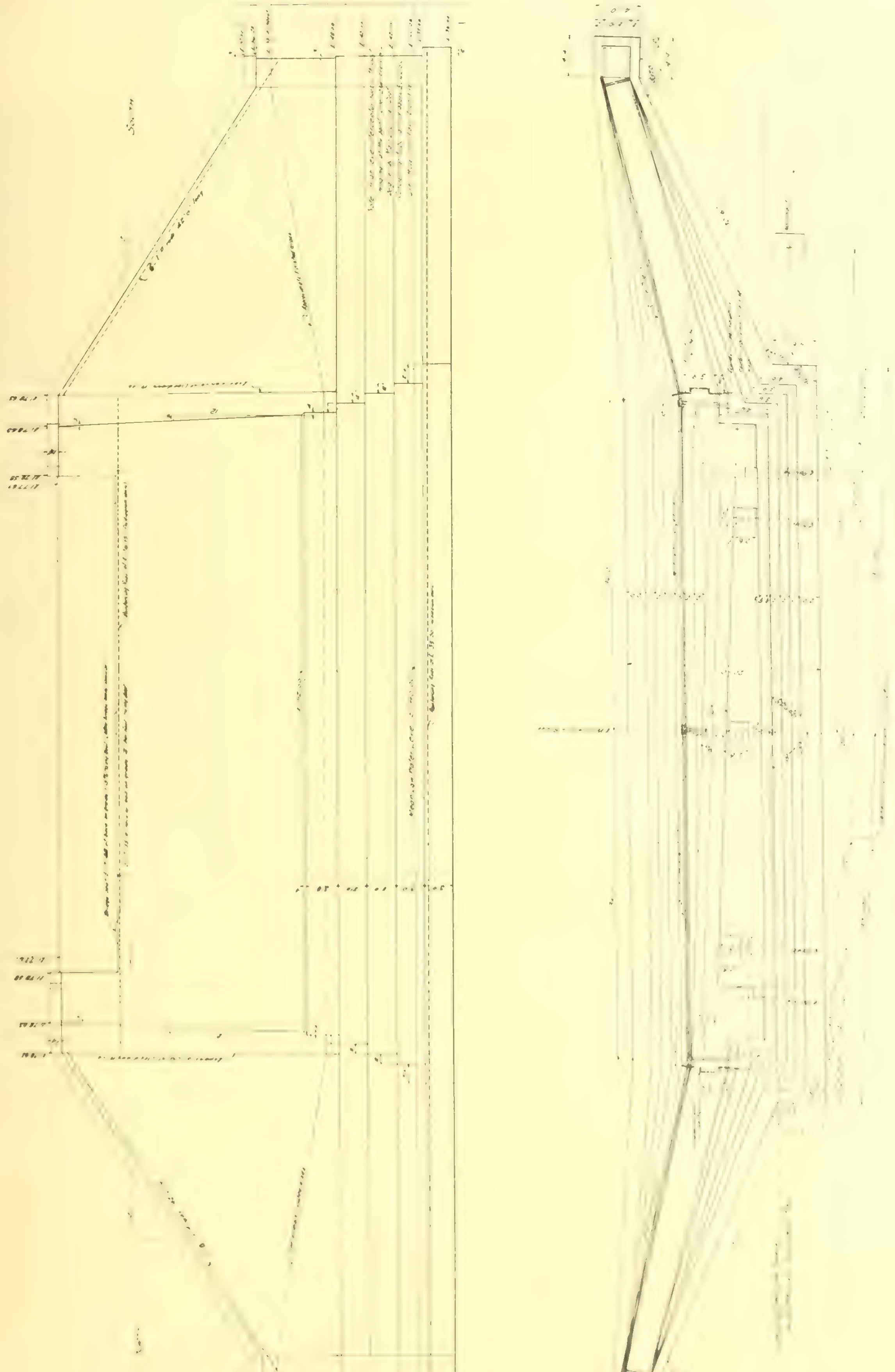
Fire Resistance of Cinder Concrete

The cinder concrete walls of the buildings used in subjecting floor constructions to fire tests at Columbia University were erected two years ago and have been subjected to five fire tests of 4 hours each, during which the average temperature has been 1,700 degrees Fahr. At the end of each four-hour test a stream of water at 60-pound nozzel pressure was played back and forth over the ceiling for 10 minutes while the ceiling walls were red hot. After this severe treatment, Prof. Ira H. Woolson states the walls were practically as good to-day as they were when new, except that the rear wall has been scored by the water to a depth of from ½ to 1 inch for 2 or 3 feet near the top. This wall gets the direct stream for a portion of the time and always receives the deflected stream from the ceiling.

A duplicate of this building torn down some years ago sustained seven four-hour tests at 1,700 degrees before its removal. At that time the walls were as good as those in the present structure. Professor Woolson is of the opinion that within reasonable limits the percentage of coal and the amount of fine material in such cinders have very little if any effect upon their fire resisting qualities. He believes that sifting and washing the cinders would be a useless expense and injurious to the cinders as aggregate for concrete. The pieces of coal which came next to the surface of these walls have been burned to an ash, but remain in place and act as a non-conductor of heat. Plenty of particles of pure coal can be found in the walls less than 2 inches beneath the surface.



Wilton Avenue Bridge.—Detail of River Pier.



Wilton Avenue Bridge Details of East Abutment

Constructing and Water-proofing a Circular Reinforced Concrete Watertank

The city of New Ulm, Mich., has just completed a reinforced concrete reservoir of 1,000,000 gallons capacity, a cylindrical structure 75 feet in diameter, with the walls 30 feet high, and covered with a conical concrete roof. The ground on which the reservoir is built consists of hard clay, well drained by natural drainage, and upon this clay was spread a layer of stone with an average thickness of 12 inches, the voids of which were filled with a wet, fine-grained concrete poured in. This formed the foundation for the floor, which is 10 inches thick, and reinforced near the surface with expanded metal of No. 16 gauge thickness and 3-inch mesh. The floor is bound to the walls by means of 1-inch round steel rods 8 feet long, bent so as to extend 4 feet into the floor and 4 feet up into the walls. These were placed 12 inches apart throughout the circumference. The walls are 20 inches thick at the bottom and taper to 15 inches at the top, with the batter on the outside. They are reinforced with 123 1⅛-inch and 40 1-inch round steel rods rolled to the required radius and placed horizontally, and by 20 upright supports made of steel angles with lacing bars, which served as supports for the horizontal rods during the time of construction, as well as vertical reinforcement in the walls. The horizontal reinforcement is sufficient to take all the stress without assuming tension in the concrete, or counting on the support of the earth embankment on the outside.

The roof consists of a conical concrete slab 3 inches thick and reinforced with No. 12 gauge, 3-inch mesh expanded metal, and is supported by eight trusses radiating to the wall from the centre pillar. The trusses are bound together with steel I-beams as purlins 5 feet apart. The steel trusses are 6 feet high from c to c of chord at the ends which rest on the centre pillar, and taper down to 3 feet at the ends resting on the walls. Since it was of the utmost importance that the walls and the floor should be watertight, special care was taken during the construction to grade the aggregate for the concrete. It has been found by experiments that the densest concrete can be made when rounded pebbles, varying in size from about ¼-inch to about 2½ inches, are used instead of broken stone, on account of the ease with which such pebbles will move about in a quaking mixture while it is being worked in place, and adjust their positions so as to form the least amount of voids. For this reason pebbles were screened from a gravel bank and used instead of crushed stone for the walls and upper part of the floor, and the sand used was a mixture of very coarse and ordinary fine sand.

To reduce the permeability of the concrete to a minimum, 20-lb. of hydrated lime was used to every barrel of cement, and after the forms were removed the walls were brushed and cleaned with steel brushes, and two coats of cement plastering were applied on the inside. The mortar for the plastering consisted of one part cement,, two parts sand, hydrated lime to the extent of 10 per cent., and Medusa waterproofing compound to the extent of 3 per cent. of the cement used. The proportion used for the concrete in the walls and the upper 4 inches of the floor was 1 : 2 : 4, and this proportion of concrete, together with the plastering, has apparently made the walls water-tight, as no leakage has been noticed up to this time, except a small leak in the bottom shortly after the reservoir was filled, which was due to an imperfect bond at one point, between old and new concrete This, however, did not cause serious trouble.

The forms for the walls were made in sections about 12 feet long by 2½ feet high, and the inside and outside parts were bound together by means of ½-inch rods extending through the walls, which were removed after the concrete had acquired its initial set. The holes formed by the rods were afterwards filled with a strong cement mortar. Only one round of form was used, as the contractor found that he could work most economically filling the forms in one day and removing them the next, and set them up for the pouring of concrete again on the third day. When it was necessary to build scaffolding two days were taken to remove and set up the form and build scaffolds. The bond between old and new concrete was made by brushing the old concrete thoroughly clean and pouring on a neat cement grout just before pouring on the new cement.

Cantilever Bridge Trusses

Although bridge trusses for long spans have undergone considerable simplification during the past decade, it is by no means true that a universal understanding exists among structural engineers as to what constitutes the best form of truss for spans so long as to require cantilever construction, says the Engineering Record. The most notable, as well as the most commendable, change that has taken place in cantilever bridge trusses is the substitution of determinate systems for the indeterminate forms which were more commonly used in the earlier stages of long-span truss construction.

In the United States the only large cantilever structure recently completed, which is statically indeterminate is the Queensborough Bridge in New York and in this bridge, as in all others in which the forces cannot be found by means of simple statics alone, it is necessary to make some assumptions regarding the action of the structure before the reactions can be ascertained for a given load upon the truss. This New York cantilever is indeterminate only as far as the reactions are concerned, and, when the reactions are once determined the stresses within the truss members may be readily found by the usual simple methods of statics. In all such statically inderterminate trusses it is uncertain whether the conditions assumed in the design really exist in the finished structure, and in view of this, the use of an indeterminate truss system is seldom if ever warranted. It is therefore gratifying that, in America, at least, there is a marked tendency to adopt simple forms.

The most recent example of this simplified construction appears in the design made by the board of engineers for the new Quebec Bridge. Even though there is the possibility that an alternate plan may be submitted by one of the bidders and adopted by the board of engineers, it is interesting to observe that the board's design is simple and determinate; reactions and stresses being readily computed by the simplest methods. The arrangement of the web members is unlike that of any other large cantilever bridge of recent design in that it is of the single Warren type, that is, both the tension and the compression diagonals are inclined, while in most of these structures the web systems are of the Pratt type with alternate vertical and inclined members. Both the Forth and the Memphis bridges have Warren web arrangements, but they are of the double-system type. The Warren system has the advantage that, inasmuch as all principal web members are inclined, a load in any position on the bridge is carried more directly to the supports than is the case where a combination of diagonal and vertical members is used. A comparison between the new and the old Quebec Bridge designs shows that in the new design both the cantilever and the anchor arms have been lengthened, and the suspended span has been shortened, until these various sections are now of equal lengths. The top and the bottom chords are now straight instead of curved, as in the former design, and while this is, no doubt, a change towards simplicity of construction it does not produce such a pleasing appearance as that obtained by the use of the curved outline.

Dust Laying at Owen Sound, Ont.

The sandy lake shore soil, upon which Owen Sound is located, results in very dusty streets. No matter how much rain falls, or how much water is sprinkled on the streets, in an hour thereafter the dust becomes a nuisance and a menace to health. To overcome this, the municipal authorities, early in the spring, experimented with oil, which proved such a success that now all the principal streets in the centre of the town are oiled These thoroughfares are macadamized and, as a preparation for oiling, are first swept clean and the oil put on immediately after with the sprinkler.

The objection at first was that the odor from the crude oil was offensive, but in a day or two this disappeared, and the change for the better to dustless streets was recognized by all. The first application of oil lasted six weeks, and the second application was put on the other day, and what were some of the dustiest streets are now perfectly dustless.

The town officials state that it will be an annual saving of $2,000 over the old water system, and at the same time give much better results.

Some Experiences on Tests of Pipe

The above subject was the title of a interesting paper read by Mr. W. R. Conrad, of Burlington, N. J., at the recent annual convention of the Central States Waterworks Association. Last spring, according to Mr. Conrad, two separate corporations wishing to put in some pipe lines that would be absolutely tight when laid and in service, ordered from two separate manufacturers a quantity of cast-iron pipe, each purchaser specifying in addition to the usual hydrostatic test that each pipe be carefully tested with air, at 50 lbs. per square inch pressure, and that while under this pressure soap and water suds be applied so as to reveal open or porous iron or defects which the hydraulic test had not developed. Because of this additional test it was determined by the manufacturers to use nothing but the best grades of iron that would give a close and uniform texture. The results were that in one case where there were 4,954 pipes tested either hydrostatically or pneumatically 27 leaked under hydraulic pressure and 272 leaked under pneumatic pressure having already passed the hydraulic test. This makes a percentage of leaks of the whole quantity tested 0.545 of 1 per cent. for the hydraulic and approximately 5.5 per cent. for the pneumatic, or slightly over 6 per cent. for the two tests. In the other case there were 2,737 pipes tested, of which 14 leaked under hydraulic and 186 leaked under pneumatic pressure, the percentage being 0.511 of 1 per cent. for the hydraulic and approximately 6.8 per cent. for the pneumatic, or about 7.3 per cent. for both. The percentage of hydraulic leaks to the total number was but about 6.2 per cent of the total number of leaks, taking both jobs together. This proportion, however, would undoubtedly have been more evenly divided had the hydraulic pressure in testing been maintained for a longer period of time per pipe, for Mr. Conrad points out that air compressed will find its way through open or porous metal more rapidly than water compressed, but in view of the fact that all of the pipe were to be subjected to an air test subsequent to the hydraulic both manufacturers depended more on developing leaks with the air than with the water. While both lots of pipe were laid for the purpose of carrying gas, Mr. Conrad believes such tests might be advantageous in the case of water mains.

Hints on Estimating for the Building Contractor

Don't forget that rates of wages are lowest in dull times and in winter, and highest in boom times and in summer.

Remember than an allowance for discounts is not operative when payment is delayed beyond the time limit.

Repairs on bargain-counter plant may be three times as great as on first-class new equipment.

Depreciation is affected by a multitude of conditions, and estimates of the amount for this item should not assume too high a figure for scrap value.

The interest on plant goes on whether the plant is working or not.

If the non-paying part of a job has to be done first, interest on the loss will run to the end of the contract.

In estimating the cost of transportation, give special attention to the character of available roads, the direction of the proposed traffic, and the time of year.

Insurance against accidents depends upon the riskiness, not to the plant, but to the men.

After making an estimate in detail, lay it aside a day or two if possible, forget the figures and then go over them again critically.

If someone else is going to carry on the work, take his personality into account in making an estimate of how much his work is going to cost.

Check up an estimate against average contract prices, selecting particularly contracts where the conditions are well known, and selecting the contract bids from firms of experience in the line of work in question.

Check over the bidding sheet to see that it compares with the estimate.

A long and big job can be estimated on more safely than a short and small one, since the accidental conditions on big work are more likely to balance themselves.

It is not wise for the contractor to figure on making money out of lawsuits as he can generally make a good deal more money by doing construction work on a square basis than he can by providing a job for his lawyer.

For trench machine work, from $7.00 to $10.00 a day should ordinarily be added for rental. Also add the cost of the sheeting, plank and pumping. In estimating the cost of trenching work, look out for boulders.

The worst estimate made upon even assumed data is generally a good deal better than guess.

To estimate the quantity of sheeting or of shiplap, calculate the exact surface to be covered, deducting openings, then add the following percentage:

For floors	1/7, or 15%	1/6, or 17%
For sidewalls	1/6, or 17%	1/5, or 20%
For roofs	1/5, or 20%	1/4, or 25%

The cost of materials will vary from year to year. A study should be made of the characteristic fluctuations in prices, when figuring closely, in order that proper prices of materials can be determined for some time in advance.

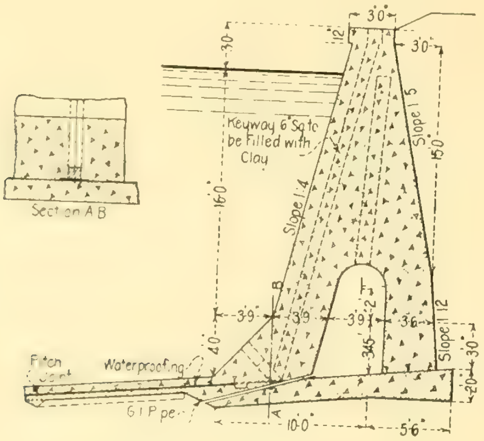
Port Mann, B.C., like Prince Rupert, has been laid out by expert landscape architects. The foresight shown at these places should offer a suggestion to older communities. It is never too late to start improvement work.

Novel Form of Concrete Reservoir Wall

Details of Construction and Design—Particulars of Tests made during Progress of Work — Material and Equipment Used

The construction of a novel form of reservoir wall for the Cobbs Hill Reservoir of the Rochester, N. Y., water works was described by Mr. John F. Skinner, principal assistant city engineer, in a paper read at the recent convention of the New England Waterworks Association. Though this structure was completed some three years ago, its design is so uncommon that details are of interest.

The reservoir is about 1,500 feet long by 600 to 700 feet wide and is a sort of irregular ellipse in shape. It was lined with concrete throughout. The bottom consisted of a 3-inch course of concrete laid continuously in long strips for convenience about 14 feet wide. To this the waterproofing was applied, which consisted of six moopings of hot coal tar pitch and five layers of single-ply coal tar felt. Above this came the top layer of concrete six inches thick, laid in 12-foot squares with pitch joints. In anticipation of the cracking of the lower layer of concrete directly beneath the joints in the upper layer (due to change of temperature in the water, which might result in a fault and a rupture of the waterproofing layer, the lower layer of concrete was thickened to 6 inches beneath the joints in the upper layer, and steel reinforcement was placed transversely to the line of the joint in this thickened portion. An interesting laboratory experiment extending over a long period with the temperatures changed artificially indicated this method of treatment.



Section of Reservoir Wall.

The reservoir wall, constructed in separate blocks of mass concrete 20 feet in length, rests upon a foundation course about 18 inches in depth laid in blocks 10 feet long. The transverse joint between the foundation blocks was offsetted 6 inches from the joint between the wall blocks, so that a reduction in the length of a wall block, due to contraction, would not crack the foundation block beneath the joint. The waterproofing of the bottom of the reservoir was carried under the toe of the wall for 2 feet. At the joints between the wall blocks it was carried 3.5 feet further to connect with the stop-water or key-way between the wall blocks.

This key-way consisted in a channel 8 inches square, set diamond-wise, 1 foot from the face of the wall, half in one block and half in the next. This opening was filled with clay and sand, rammed with a light pile driver specially constructed for the purpose.

These 20-foot wall blocks contained 106 cubic yards of concrete. A central passage was left through the wall which saved about 1 cubic yard per linear foot. This passage is for inspection, the wall being 3.5 feet in thickness both in front and back of the opening. A tell-tale pipe 1 inch in diameter was built into the foundation weather amounts to about 20,000 gallons per day; in warm weather, it is scarcely appreciable. Recent gagings show less than 1 gallon per minute for the 3,600 linear feet of wall.

It was originally intended to make a concrete of screened sand and gravel, but early blocks every 20 feet said pipe at one end, opening into the sand and gravel beneath the toe of the foundation block, the purpose being to indicate by a jet of water into the tunnel if a break occurred in the lining near the foot of the wall. Up to the present time no indication of this kind has been recorded. This tunnel is 7 feet high, and is lighted by electricity. The leakage through the joints in cold in the work, this was changed to run-of-bank, the latter being uniformly good. Volumetric measurements of voids in the material were made daily during the construction of concrete and it was found that 1 bag of cement to 6 cubic feet of sand and gravel produced a concrete a trifle denser than an artificial mixture of 1 cement, 2½ sand and 5 clean gravel. The wall blocks were generally built in two shifts, no stop being allowed until 2 feet above top of the tunnel. Some blocks were made in a single shift. They were built alternately, the intermediate blocks being constructed after the first forms had been removed. The concrete was prepared in a Hains' mixer, dumped into yard buckets on cars hauled by locomotives and then handled by a McMyler crane. Ten forms were built for the wall blocks and used repeatedly, as 180 blocks were constructed. The material was brought to the mixer on a belt conveyor and the concrete for the bottom was hauled on an industrial track by a home-made gasolene motor.

The area of the water surface in the reservoir, when filled, is 18.6 acres, and the maximum depth of water is 25 feet. Its contents is about 144,000,000 gallons.

Purification Plant of the Rochester and Lake Ontario Water Company

The company's plant is 1¼ miles west of Charlotte, on Lake Ontario, and the supply is taken from a point 4,000 feet from shore where the water is 40 feet deep. The average pumpage is now over 4,000,000 gallon daily.

The filter plant consists of eight pressure filters, each 8 feet in diameter and 25 feet long, having a sand area of 200 square feet each. There is a pressure of 235 lbs. on the filters. They are washed when they show a frictional resistance of 15 lbs. About 2½ per cent. of the water filtered is used in washing the filters. When the filters are cleaned the frictional resistance is about 4½ lbs., when operating at the rate of 81,000,000 gallons per acre per day, and about 7 lbs. at 148,000,000 gallons. The sand in the filters is about 3 feet in depth, has an effective size of 0.46 mm., a uniformity coefficient of 1.51, and 60 per cent. is finer than 0.74 mm.

When the lake became turbid from a storm it was impossible to remove the turbidity by the filters, although the bacterial efficiency was satisfactory, as the coagulant did not have sufficient time to entangle the finer particles which made up the turbidity. To overcome this condition a coagulation basin was placed in operation in the autumn of 1907, since which time no trouble has arisen from turbidity of the filtered water. The basin, which is of wood, is 6 x 48 x 201 feet, and contains about 430,000 gallons. The installation of the basin has resulted in the saving of water used for washing filters, while the total bacterial efficiency of the plant is somewhat higher.

Sulphate of alumina is used as a coagulant, and at times calcium hypochlorite is also used. The use of the latter has greatly reduced the cost of operation, while at the same time the high bacterial efficiency is maintained. The average amount of sulphate of alumina used is about 0.7 grain per gallon. The average amount of calcium hypochlorite used is 0.48 grain per gallon. The coagulants are dissolved in wooden tanks, 5 feet in diameter and 15 feet high, and are applied to the raw water through gravity orifice feed boxes.

Some trouble, due to the odor and taste produced by algæ in the raw water, has been encountered in the operation of the plant. The algæ gave trouble during the winter months on two occasions. To relieve the trouble, copper sulphate has been good success.

At the time of the algæ trouble of February, 1910, an attempt was made to treat the growth with calcium hypochlorite, but the results were not satisfactory. Sufficient hypochlorite was used so that the treated water gave the reaction for free chlorine.

Corrosion of Steel Pipe

Corrosion of a 48-inch steel pipe of the water supply system of Newark, N. J., caused a leak in August, 1909, which led to an inspection of this and a second pipe line, both laid across the Pacanac Swamp. In the last annual report of Mr. Morris Sherrerd, chief engineer of public works, it is stated that the pipe most badly corroded was laid in 1891 and the other in 1896.

The two steel pipes at the point most affected were laid in a swamp of peaty material to such an elevation that about one-third of the pipe was above the original surface of the swamp; a filling of light-colored earth, taken from burrow-pits adjacent to the swamp, was then made to such an elevation as to make a fair roadway over the pipe.

The decomposition of the pipe takes place in spots, and while the larger number of spots were in the vicinity of the line between the original surface of the swamp and the earth fill, there were still some affected spots both in the peaty soil as well as the earth fill.

Samples of the peaty soil as well as the earth fill showed a slight acid reaction, probably produced by the decomposing vegetable matter during the formation of peat, but when extracted with water, the liquor is distinctly alkaline, which would show that the small amount of lime and other elements present were sufficient to neutralize the acid in the presence of sufficient water.

It was found that the nodules of decomposed steel are the result of an electrical current flowing between the pipe and the surrounding earth, possibly enforced by some weak acid existing in the earth as shown by the slight acid reaction of the latter.

Examinations were made to ascertain to what extent the steel pipe lines were carrying electric currents. This survey did not show that the corrosion of the pipes could have been caused by any electric current carried on the pipes themselves, and since the deterioration of the pipe lines seems to be confined to this particular swamp, it must be concluded that something in the soil had produced the corrosion, either from its nature or by producing local electrolytic action.

After repairs the outside of the pipe was thoroughly painted and the fill around the pipe was made with gravel instead of the peaty soil, removed. Further inspection will be made of the particular section of this pipe across this swamp.

"Rat proof" construction is a new term in the building world. It is in vogue at San Francisco, where special measures are being taken with a view to exterminating the rodents.

Clear Water as a Municipal Asset

An interesting paper on the above subject was read last month before the Central States Waterworks Association by Mr. Geo. C. Whipple, of Hazen & Whipple, consulting engineers, New York City.

After discussing the physical, chemical and bacterial standards of purity Mr. Whipple stated that during the last few years chloride of lime has been much used for disinfecting water supplies. This germicide has won for itself a place in water purification from which it will not be soon dislodged. That calcium hypochlorite will kill the colon and typhoid bacteria must be admitted, yet it does not completely disinfect. For example, it is doubtful if it will destroy spore-forming bacteria to any great extent. Although the bacteria are thought to be killed by an oxidizing process, the use of bleaching powder in the quantities used for killing bacteria has, according to Mr. Whipple, no appreciable oxidizing action on the organic matter present in the water. It does not improve the appearance of water, nor its taste, nor odor. As an adjunct to filtration the use of calcium hypochlorite in the future is likely to be large, as it offers an additional safeguard and supplements the work of the sedimentation basin and the sand bed. It sometimes enables higher rates of filtration with this coagulant to be used and thus reduce cost. The hypochlorite treatment, Mr. Whipple believed, will assume an important place in the field of water purification, but one subsidiary to the long established methods of obtaining clean water.

The use of hard water entails serious losses to the consumers, and such losses may vary all the way from o to $30 or even $50 per 1,000,000 gallon, according to the hardness of the water. Water softening is more expensive than ordinary filtration, and therefore the balance in favor of this process is less, and in many cases the cost of water softening is perhaps not justified on economic grounds. Where, however, the hardness of the supply exceeds 250 parts per 1,000,000, and perhaps in some cases where it is even less than this, softening may be a good business venture, according to Mr. Whipple.

Repairing a 16-inch Main*

In March, 1910, a leak developed in the 16-inch main line of the water supply system of Delaware, Ohio. Upon investigation it was found that the pipe had a vertical crack from the bottom extending to nearly the top on one side of the main. An attempt was made to repair it with a wrought iron band 4 inches wide, in two sections, but it was impossible to shut off the water, as one 16-inch, one 12-inch, one 8-inch and three 6-inch gates were to be closed, and they leaked so that a trench pump was required to keep the water down so that work could be done. It was soon found that the repair could not be made in this way, as the leak was too great; a Kellogg repair sleeve 36 inches long and weighing about 900 lbs. was tried. Three 2-inch holes with plugs were placed in the bottom to care for the water leaking through the gates while connecting and leading. The sleeve was in two halves and was connected along the sides with rubber gaskets and secured by about thirty bolts and nuts to make the side joints; the ends were then leaded and caulked as is usual with new pipe. One hard day's work was required to make this connection, and when all was tight it was believed that the work was successful, but in about six weeks a leak developed again in the same place; fortunately the street in which the pipe was laid was not paved. After opening up the trench again it was found that a crack about 4 inches long had developed at one corner of the top plate flange; examination showed that no caulking would repair it, and the work had to be done over again. A new top plate was ordered and when it arrived the gates were again closed as well as possible, the trench pump set at work and the old sleeve taken off and replaced with the new top half bolted up and again leaded and caulked in one day. The leak was effectually stopped by this sleeve.

---

*Abstracted from paper read before the Central States Waterworks Association by Mr. C. W. Miles, Delaware, O.

Copper sulphate to prevent algae was used in four of the reservoirs of the Albany waterworks during 1909 before the commencement of warm weather. Two of the basins were treated four times during the season, another three times, and another twice. The maximum amount of copper sulphate used during any one application was 0.32 parts per million and the minimum quantity 0.1 parts per million. The early start made with this treatment and the constant watching for the development of aquatic growths are the reasons given by Mr. H. J. Deutschbein, superintendent of the Bureau of Water, to account for the fact that no complaints regarding the algae were received during the year. The reservoirs are supplied with filtered water from the Hudson River.

Some Causes of Failure in Street Paving

Inefficient Sub-Drainage and Excessive Flushing among the most Common Sources of Injury—Interesting Practical Notes on Constructional Methods

The deterioration of street pavements by water is ascribed by Mr. George C. Warren in a paper presented before the recent convention of the American Society of Engineering Contractors to the following causes: Improper sub-drainage; excessive sprinkling or flushing; lack of efficient cleaning; sub-drainage, due to the absence of pavements, or to their improper construction, between and around railroad tracks; too flat crown or grade to provide proper surface drainage.

The successful elimination of water, both from the upper and under surfaces of the pavements in a city in central New York, is accomplished, according to Mr. Warren, by an efficient system of sub-drainage and by thorough dry cleaning and entire absence of wetting down the dirt by excessive street sprinkling and flushing. The system of sub-drainage in this case, which was adopted in the year 1886, and has been strictly adhered to since, is as follows:

A trench 1 foot wide is excavated under the curb to a depth of 3 feet below the top, or 18 inches below the bottom of the curb. In the bottom of the trench is placed a narrow culled hemlock board for which other cheap lumber may be substituted, and the pavement side of the trench is boarded up with the same material, up to the bottom of the curb, to prevent the earth under the pavement, as it dries, from falling into the drain. On the board in the bottom of the trench is placed a line of 3-inch half round porous tile open at the bottom and with open joints.

Over the tile the trench is filled to within 2 inches of the bottom of the curb with hand placed field or cobble stone, over which is spread a thin course of finely crushed stone, slate shale, or slag, fine enough to fill the chinks in the field stone at the surface, but coarse enough not to run into and fill the spaces between the pieces of field stone. Over this is spread about 1 inch of loam or clay (not gravel or sand), which, when dry, will hold together and not sift into the drain. The curb is set in the usual way; if the curb is of stone it is bedded in either gravel or concrete; and if the curb or gutter is of Wainwright or other Portland cement, it is laid directly over the drain. Of course, the drains are connected with catch basins. This method of construction is the best and most economical system of sub-drainage Mr. Warren has known. No cross drains have been necessary, although the natural drainage conditions are very poor.

System of surface drainage of which Mr. Warren disapproves, either because of inefficiency or unnecessary expense, are those that include too shallow drains at the curb and trenches filled with crushed stone in the centre of the road with similar cross drains at intervals. The cross drains, he states, tend to attract water from outside the roadway and carry it under and to the centre of the pavement, where it percolates into the otherwise dry sub-soil. With any of the modern, nearly waterproof forms of pavement, the sub-soil under the pavement will be practically bone-dry if no water is allowed to percolate from back of the curb. To prevent this a drain having a depth of 3 feet below the curb is all that is necessary.

Inefficient Drainage.

The most frequent causes of failure in pavement construction Mr. Warren believes to be inefficient drainage, improper back-filling of trenches, insufficient crown and gutter grade to carry off water and prevent pools standing near the centre and in the gutters of the roadway, lack of cleanliness, excessive flushing or sprinkling of streets, inadequate pavements, or none at all, between and along railroad tracks.

The efforts of some street cleaning interests are directed toward keeping the streets wet by various forms of sprinkling and flushing machines, without properly cleaning the surface of the pavements. Still other interests engaged in street cleaning advocate dry cleaning and are developing methods to accomplish their purpose. Their objects are feasible, but pending the advent of machines that will efficiently and economically do the work, all municipalities, Mr. Warren, states, should take a middle ground and follow one of the following courses. (a) Thoroughly wash the pavements nightly, without pressure, using either a washing machine or fire hose, and immediately follow the washing with hand squeegees to remove all excess of water from the gutters and slight depressions. (b) Sweep nightly with machines, lightly sprinkling the pavement in advance of the sweeper, and using enough water to lay the dust, but not enough to convert it into mud—exactly as a dirty floor is cleaned by light sprinkling and had sweeping.

Railroad beds improperly constructed, or tracks poorly laid, are common sources of injury to pavements, and the damage will extend not for only a few feet from the rails, but sometimes across the entire width of road bed. The same undesirable results are often produced by faulty construction in the pavement itself between and along the rails. If the rails or the ties are not so securely laid as to prevent vibration the pavement, whatever may be its construction or the material used, will be sure to break and allow water to work its way through and settle beneath the pavement.

Mr. Allan Hazen, consulting engineer, of New York, the expert engaged to investigate Ottawa's water supply, presented his report to the City Council last week. He reported that the present source of supply from the Ottawa River was contaminated by sewage, and that eighty per cent. of the water pumped was lost through leakage. He recommended McGreogor's lake, in the Gatineau river district north of the city, as a permanent source of supply, or else the installation of a complete filtration plant. He stated that the cost of the McGregor's lake proposal was $2,400,000. The filtration plant would be $100,000 less. Council postponed action on the report.

Roadway Construction and Maintenance

English Practice Appertaining Chiefly to the Work of Large Towns — Instructive Notes on Waterproofing and Tar Treatment

By R. E. Crompton, M. Inst. C.E., London, Eng.

It will be found convenient to divide the roadways of our towns into three classes, the first consisting of the widely used macadamized roads which form the chief part of the roadways of villages and small towns, and a very large proportion of the roadways of the larger towns; the second class being the improved roadways usually covered with wood or asphalt pavement which have been so largely adopted in all the large cities and in many of those of moderate size; and thirdly the granite set pavements that are used wherever the traffic is exceptionally heavy, such as that on the roadways in the immediate vicinities of docks, quays, railway depots or similar places where the traffic tonnage per square meter is consequently exceptionally heavy.

Taking these in order, at the present time we find in England that the improvement of the first class, namely of macadamized roadways, is of paramount importance. These roads are chiefly found in the residential districts, whether these be old or new, in which the residents live in order to obtain comparative quiet and freedom from the nuisance caused by traffic. The roadways should be formed so as to possess certain characteristics, the principal ones being that they should allow the traffic to pass over them as noiselessly as possible; they should be free from dust in summer and from mud in winter, should be easily cleansed and should be economical in the cost of maintenance.

Up to a few years ago these conditions could not be satisfactorily met by any existing form of macadamized road, but since waterproofing the road surface by tar treatment has become general, at any rate in England, the author thinks that this problem of treating town roads can be solved in a satisfactory manner. The development of tar treatment, the practical commencement of which dates only three years ago, has been so great that in the residential districts in London in which these roads have been already so treated, it has proved to be of exceptional benefit and comfort to the inhabitants who live in the houses adjoining these roads. The success of the treatment depends on a thorough study of the materials used, the selection of the tar or bituminous binder being of great importance. This selection is again dependent on the nature of the stone used and on the extent to which this can be dried previous to impregnation.

Choice of Material.

Another matter requiring much skill and experience is the correct choice of the available granites, basalts and other roadway materials, the tar imbibing properties of which differ considerably. Again it is important that attention should be paid to the heat radiating properties of these materials, as otherwise there is a tendency for hoar frost to be deposited on the tarred surfaces which renders them slippery and likely to give bad foothold to horses or insufficient adhesion to the rubber covered driving wheels of mechanically propelled vehicles.

Another secret of success is that the tar or bituminous binder should be applied in minimum quantity, only just sufficient to render the road waterproof, for any excess of tar which remains fluid within the road after the traffic is turned on it is liable to remain within this condition for a long time, so that the individual stones forming the road surface instead of being held firmly in position are allowed by the lubricating action of the still fluid tar to move among themselves and hence are ground up by mutual altrition and destroyed as was the case with water bound macadam roads during very wet weather or after frost.

Methods of Applying Bituminous Binder.

There are two distinct methods of applying a bituminous binder to the roads, the first being a surface method, generally called tar spraying, which may be carried out either by hand or by machinery, and which under favorable circumstances binds the surface to a depth of about 20 mm. By favorable conditions is meant that the tar is applied when the roadways are thoroughly dry and the existing dust thoroughly cleansed from them before the tar is applied. In wet seasons it is difficult to obtain these conditions, and the penetration of the tar below the surface and its durability are thereby much reduced, but under the most favorable circumstances this surface application of tar can only be expected to bind the surface for one season, so that is is evident that the more complete method of impregnating the whole of the road material to a depth of 80 mm. from the surface line must be eventually carried out. Whenever this has to be done to existing roads the material must be removered to the full depth of 80 mm. and replaced by a layer of tarred aggregate, rolled down to the same thickness, this aggregate consisting of impregnated angular pieces of granite or basalt of such size that they will pass through a 60 mm. ring, combined with sufficient smaller particles to fill up the interstitial spaces so that the tar previously applied to the large and the small material fills up the remaining spaces and renders the road non-porous and hence prevents the surface water, either the rain or that from artificial watering, from penetrating it.

A roadway so formed becomes so waterproof and so durable that it can be laid with a crossfall or camber which need in no case exceed 1 in 50, and in many cases will yield satisfactory results with the smaller crossfall of 1 in 60. It is important that this top material should be rolled with comparatively light rollers which must never exceed 10,000 kilos in weight, for it has been found a great mistake to use rollers exceeding this weight, as they are liable to crush the new material exposing new untarred surfaces and hence preventing satisfactory waterproofing. The cost of such waterproof coatings has been found in England not to exceed Frs. 2.30 per square meter on the average. From experience already obtained it is believed that for ordinary traffic this coating will last from six to ten years without renewal, but to obtain the best results it is advisable to make certain that the surface remains waterproof by giving it a light waterproofing coating of tar by spraying every year, or every alternate year.

Roads so prepared and so treated possess in a maximum degree the qualities of noiselessness, cleanliness and ease of scavenging and require little or no artificial watering during dry season. The author considers that the use of this class of road will become universal for all the light traffic streets of our large towns and for all the streets of our small towns, and that it will in many cases be found to advantageously take the place of the more expensive pavements which have been used in the second class of streets, which carry heavier traffic.

The author proposes to leave to others the discussion of the

---

* Paper presented at the Second International Road Congress, Brussels.

best methods of constructing the wood or asphalt paved streets of the second class and of the granite paved streets of the third class.

Summarizing, the author believes that the improved waterproofed macadam herein indicated is a satisfactory solution of the problem of dealing with the roadways of the majority of our streets of all our towns, and that the other problems of dealing with the second and third classes of roads are already satisfactorily met by the wood and granite pavements already so largely in use.

Adhesion Tests of Steel and Concrete in Beams

The strength of reinforced concrete beams depends not only on the amount, kind and position of the steel, but upon the adhesion existing between the steel and the concrete. In most structures where adhesion plays such an important part the rods are placed horizontally as in beams, and the tamping is done at right angles to the length of the rods. In columns, however, where adhesion is of relatively less importance, since safety would seldom if ever depend entirely upon it, the tamping is parallel to the rods. It is quite evident that the bond of union would be different in the two types of structures, namely, those in which tamping of the concrete is carried on at right angles to the rods, and those in which it is parallel thereto. It seems proper, therefore, that in making laboratory experiments to determine working values of the bond of union, this should be taken into account by preparing some specimens in one way and some in the other. Most experiments thus far recorded have been made by determining the amount of pull necessary to withdraw an embedded rod from a block of concrete, and from this the adhesion per square inch is computed; the assumption being made that the adhesion is uniform over that part of the rod's surface in contact with the concrete. In the reports of these experiments it is not generally stated whether the concrete is tamped parallel with, or at right angles to the rod, but in most cases where this information has been given the tamping was parallel to the rod. From tests recently made, but not yet published it seems that the adhesion from tamping at right angles is only about one-half that for parallel tamping. Recent tests to determine the adhesion by means of short beams are along the right direction for it is not good engineering to obtain data from tests, and then apply them to designs where the conditions are entirely different. If rods are to be used horizontally in a beam then by all means let them be placed in a similar position in the tests which determine the adhesive values that are used as a basis on which the beam is designed.—Engineering Record.

Use of Reinforced Concrete Poles

The following information concerning the use of reinforced concrete poles by the Fort Wayne & Wabash Valley Traction Company was given at a recent meeting of the New York State Street Railway Association.

The company built a couple of these poles about two years ago. The experience with them was so satisfactory that others were made until about 125 are now in use and it is expected about 60 more will be added shortly. They are employed mainly in city line work on straight track, but a few are in use experimentally at corners. They are spaced from 100 to 125 feet apart and given the same rake as wooden poles.

The company has a large gravel bed on the same lot as its power house, and up to the present time all of its poles have been made by a contractor on this lot at prices ranging from 20 to 25 cents a foot, or $7.50 for a 30-foot pole, depending upon the price of the reinforcing steel. A mixture of one part cement and four parts gravel is used, the gravel being of such a grade that the actual mixture is about one part cement two parts sand and two parts fine stone. The reinforcing rods are ½-inch twisted bars, 30 feet long, eight to a pole. The forms are made from three 30-foot 2-inch hard pine planks, cleated across for the prevention of checking, with chamfering strips nailed on the sides of the form. A complete form thus consists of three planks and two blocks for the ends. The forms are held together by ordinary bench clamps.

The method of casting the poles is as follows: The forms are assembled on several blocks or sills to give a firm level bearing and 1 inch of concrete is placed on the bottom of the form throughout the length. Then three reinforcing rods properly spaced are laid on this concrete and more concrete is filled in until the forms are half full. Two more bars are now placed each 1 inch from the sides of the forms and concrete is filled to within 1 inch of the top of the forms, when the last three bars are placed. The remaining space is then filled with concrete and the top smoothed off with a float. As the form is filled the concrete is carefully troweled and spaded, but no other ramming is done and no surface finish is used. The holes for cross-arm and other bolts are made by iron rods which are run through the forms at the proper points and are taken out when the forms are removed. The pole is taken out of the forms three or four days after casting and is allowed to dry out for two weeks, after which it is ready for use.

By using a gin pole and a gin wagon the Fort Wayne Company erects its 30-foot concrete poles at a labor cost of $1 62, bringing the total cost of delivery and erection to $3.25, which compares very favorably with the cost for setting wooden poles.

The success of these poles has led the Utica & Mohawk Valley Railway Company to construct two poles of the same kind. In making this pole a mixture consisting of one part cement and two parts sand and two parts crushed stone was used. The length of this pole is 35 feet and its calculated weight was about 3,000 lbs. In this connection it might be said that a 35-foot iron pole weighs 1,421 lbs. when made of 8-inch, 7-inch and 6-inch extra heavy pipe.

As only two poles were built by the Utica & Mohawk Valley Company, the cost was higher than for construction of a larger number. The cost of the latter in detail, based on a pole 35 feet long, 6 inches square at the top, 11 inches square at the base and 10 inches square 8 feet fro mthe base, is estimated, per pole, as follows:

Cement, 5⅓ cubic feet, at $1.60 per bbl	$2.13
Sand, 10½ cubic feet, at 0.75 per cubic yard	.28
Stone, 10½ cubic feet, at $1.00 per cubic yard	.39
Steel, 237 lbs. at $0.16 per lb.	4.60
Total material	$7.40
Labor	1.14
Total cost	$8.54

Or 24½ cents per foot.

The company has found that these poles may be transported in the same manner as wooden or iron poles. It is necessary only to take care to avoid chipping of the corners. In future poles one of the reinforcing rods is to run out of the bottom and top of the pole to act as lightning, ground and protector.

The Utica & Mohawk Valley Company has not built any more concrete poles than the two originally constructed, but is contemplating manufacturing about 50 of them soon. A few will first be made and given a thorough test. If these tests prove satisfactory the company will complete the order for the 50 poles.

Reports from Prince Rupert are to the effect that the labor supply in that part of the province is now fully equal to the demand.

Vancouver and Coast Correspondence

Building in Vancouver During 1910 will Represent Value of $12,000,000 —Provincial Government and Asiatic Labor—C. P. R's Extensive Plans

Office of The Contract Record,
Vancouver, Oct. 13, 1910.

Unprecedented building activity is still the feature of business in this city. There is every probability that 1910 will close with a record of $12,000,000. This will exceed by $3,000,000 the total of last year, while it will be actually $10,000,000 more than 1904.

The permits issued during September aggregated $119,500, bringing the total for the year to approximately $9,000,000. October is expected to be a good month and fair returns are expected from November and December, the climatic conditions being favorable to construction at this time.

Within the last few weeks the city has been visited by groups of financiers and investors affiliated with the Morgans, the Goulds, the Rockefellers and other capitalists. There is now in the province a group of industrial titans whose personal wealth as well as that of the rich clients they represent, will run to almost untold figures, and the tone of all the interviews they have given out is to the effect that British Columbia is the coming province for rapid development and that Vancouver is the most progressive and prosperous city on the Coast.

Excavation has commenced on Hastings Street for the erection of a fine eight-storey block for the Bank of Ottawa. The proposed structure will cost $250,000 and will be finished, it is hoped, by next May. The plans call for a building 52 feet by 120 feet, the base to be of concrete and stone with brick and stone trimmings above. The entrance to the vestibule and lobby will be executed in marble. The building will be replete with every modern improvement.

No Asiatic Labor on B. C. Railroad Work

The British Columbia Government has refused to grant an order-in-council permitting the Grand Trunk Pacific to employ Asiatic labor on their construction.

It is urged that such is the labor situation and so acute the feeling against the utilization of other than white labor that it has been found impossible to carry on the construction in British Columbia beyond the completion of the present contract to a point 238 miles of Prince Rupert. The contractors had declined to take on any more work from British Columbia. They state that owing to present conditions they are losing hundreds of dollars daily under their contract.

It was urged, that under the contract between the company and this province relating to the exclusive employment of white labor in construction, an agreement was made by which the Government might sanction an abrogation of the white labor clause in the event of a sufficiency of labor not being found available.

President Hayes stated that if permission were accorded for the employment of Asiatic labor he would enter into an undertaking not to employ such labor while white labor was available, and, further, to give employment to all the white labor offering for construction work at the current rate of wages.

Premier McBride pointed out that railway construction in adjacent states being at present at a standstill there must naturally be a considerable number of workmen in that territory, who would be glad to come to British Columbia for profitable railway construction work, and who would very probably remain as permanent citizens.

The Canadian Pacific Railway Company has announced that it will build twelve hotels across the continent during the next year. The one to be erected in Vancouver which will be up-to-date in every respect, will be built one section at a time, so as not to interfere with the travelling public any more than can be helped. Mr. Painter, chief architect of the company, was in the city recently. The foundations for the first addition to the Vancouver hotel have been completed for some time, and the active construction of the building may be looked forward to at an early date. What the cost of the new hotel will be is not yet known, but it is expected that the total cost involved will be in the neighborhood of $350,000.

The Palmer Land & Investment Company have given notice of an application to the Dominion authorities for the approval under the navigable Waters Protection Act of a large wharf on False Creek, on the west side of Westminster Avenue. The plan shows a wharf covering the full frontage of 100 feet, owned by the company on the avenue, extending into the creek 293 feet on the north side and 325 feet on the south.

The report that the Canadian Pacific Railway will establish car building shops at Westminster is denied by Superintendent Busteed. The report probably originated from the fact that the company are enlarging the yards at that point.

Messrs. Bullen, of the B. C. Marine Railway Company, at Esquimalt, have submitted plans to the minister of public works at Ottawa for a graving dock to be built at Esquimalt at an approximate cost of $3,000,000.

It is expected that final work will be commenced on the new cement wharf at the foot of Lonsdale Avenue, North Vancouver, in about a week, the large pontoons which are being constructed by the McDougall-Jenkins engineers in that city are about completed and it is the intention to finish the contract as rapidly as possible.

Engineers are now at work making surveys in connection with the project of the Canadian Collieries, Limited, for the development of $50,000 horse-power on the Partridge river in the centre of the Comox coal field. Within a few weeks hundreds of men will be engaged in building a dam across the river and erecting a power plant. About a year will be occupied in completing the big undertaking. The proposed improvements will cost $1,000,000. The electrical energy to be developed will be utilized in operating a system of compressed air haulage in the mines and running various plants as well as fourteen miles of railway connecting the collieries with ore bunkers at Union Bay.

A recent visitor to Vancouver, B. C., was Mr. R. E. Palmer, formerly assistant city engineer there. Mr. Palmer is now manager of the Rio Tinto mines in Spain, one of the largest copper mines in the world. The company, which is a British one, employs in the neighborhood of 12,000 hands and is the direct source of support of about 50,000 people in Spain. There are five towns for workmen on the property and the port of Huelva, from which all the shipping of the ore is done, has a population of about 25,000.

According to a despatch from Phonix, B. C., we learn that construction is commencing on the Kettle Valley Railway. J. G. McLean & Co., the contractors for the work, have arrived at Phoenix with a large plant and will do as much work as possible before the snow flies. Their headquarters will be at Midway for the present. They have awarded a number of subcontracts and hope to proceed with construction all the winter. The Kettle Valley Company will make a divisional point at Penticton.

City Streets and Boulevards

At the annual convention of the National Good Roads Association, held at St. Louis, Sept. 28-30, Mr. J. C. Travilla, street commissioner of St. Louis, read a paper on the above subject, in which special reference was made to the practice in St. Louis. Asphalt and bitulithic pavements he considered specially adapted to residential streets and boulevards, without street car tracks, and where heavy hauling is not excessive. On narrow streets with car tracks, traffic is confined to the space between the outer rail and the curb line, and if not sufficiently distributed, the wagon tires invariably form a groove in the pavement. Paving the space between the street car rails with these materials is not recomended. Wood block pavement he considered well suited to high-grade residential streets and boulevards and for streets in the retail business districts where there is much mixed traffic and a demand on the part of the merchants for a noiseless pavement. Its objectionable feature is its smoothness, causing it to become slippery under certain weather conditions. This may be overcome, however, by the use of sand. It has been the practice of the department here to use oiled sand applied late in the fall and early spring. By the use of oil, the sand is held in place on the surface of the pavement and not blown to the curb line. The use of brick, in his opinion, should be limited to streets having car tracks and the less important residential streets. Granite blocks alone meet traffic conditions in the railroad and warehouse districts of the city.

The use of macadam he considered well adapted to city streets where property values are low and where there is a demand for a temporary paving, pending the construction of sewers and the laying of water mains, and on boulevards and roads carrying light traffic.

Street sprinkling in St. Louis is done by contract, and costs from $450 to $500 per mile per annum. More than 500 miles are included in this contract, which costs the property owners about 4 cents per front foot.

Four grades of oil for surface treatment, having specific gravities of 30 degrees, 20 degrees, 16 degrees and 12 degrees. Beaume, respectively, are used. Each has its place, according to Mr. Travilla. The first, second and third are residuum oils and the 12 degrees grade an oil-asphalt compound. No. 1 is for cinder roads and those that have had a previous treatment with a heavier material; No. 2 is recommended for park roads; No. 3 on main thoroughfares, and No. 4 on any type of road, since it simply forms a binder for the mineral matter which actually bears the traffic. When traffic and road conditions have been ideal, surface treatments in St. Louis last throug two summers, with every indication of at least a year or more of wear without attention other than the maintenance. This condition, however, will not exist on the average highway, and Mr. Travilla does not expect a road with such a wearing surface to have a long life.

It costs from $450 to $700 per mile per annum to properly sprinkle a road with waters, exclusive of maintenance. Oil treatment will cost from $400 to $800 or $1,000 per mile, depending upon the width of the roadway, the time spent in its preparation and the grade of the oil used, as well as the amount of mineral matter required for covering. The maintenance of a road that has been oiled instead of watered will be reduced to a minimum.

Long and heavy timbers can still be obtained, although at a heavy price. A lot of 30 x 30-inch timbers in long lengths was recently received at Quebec by Messrs. Davis, the contractors for the substructure of the new Quebec Bridge, who use them for the solid cutting edges of large pneumatic caissons which are being used in the construction of the bridge piers. Some unusually long sticks of Oregon fir for derrick timbers were recently received by Mr. W. J Haskins, of New York City, among which were pieces 120 feet long, tapering from about 28 to 32 inches and running very straight and sound. As they are kept constantly in water they do not deteriorate by storage. Some contractors who use both wood and steel derricks prefer the former for loads up to 15 or 20 tons, because they are considered less liable to injury by minor accidents and because they give timely warning of over loads. They are, however, much more difficult to ship, and cannot be made of so great capacity as steel derricks.

Canadian Society to Meet in Winnipeg

At a council meeting of the Canadian Society of Civil Engineers held recently in Montreal, and presided over by Col. H. N. Ruttan, city engineer of Winning and president of the society, it was decided to accept the invitation of the Manitoba branch of the society to hold the next annual convention at Winnipeg. Professor C. H. McLeod informs us that the meeting will take place during the last week in January. In addition to those mentioned, the following were present: G. A. Mountain, chief engineer of the Railway Commission, Ottawa, a past president of the society; W. F. Tye, of Toronto, and R. W. Leonard, of St. Catharines, vice-presidents; and Messrs. C. R. Coutlee, Ottawa; R. J. Durley, J. M. R. Fairbairn, W. J. Francis, L. H. Herdt, Phelps Johnson, C. N. Monsarrat, J. M. Shanley and C. H. McLeod, Montreal.

The membership roll of the society is now about three thousand.

Personal Items and Notes

Following a visit from Mr. E. T. Nesbitt, of Quebec, president of the Canadian National Association of Builders, the Edmonton Builders' Exchange passed a unanimous resolution in favor of affiliating with the larger body.

Mr. A. J. Matheson, C. E., left Temiskaming last week for British Columbia. Upon his departure the engineers of the Georgian Bay and Ottawa water storage survey presented him with an address and a gold watch and chain.

The 5th annual convention of the Union of New Brunswick Municipalities will be held at Woodstock, N. B., Oct. 19-20. Particulars may be obtained upon application to the secretary, Mr. J. W. McCready, Fredericton, N. B.

Permits issued at Winnipeg, Man., up to the end of September, totalled $13,132,800, compared with $8,369,750 for the nine months of 1909. 2,799 and 2,112 permits were issued in these periods respectively. The total for the month of September was $804,400, compared with $802,950 for September, 1909.

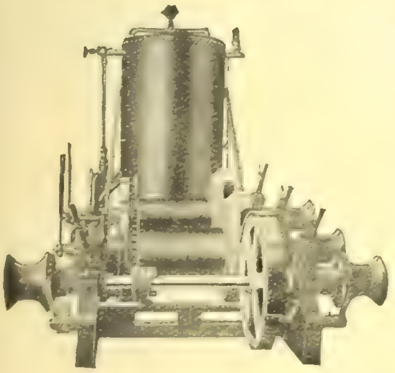
Building activity is reported from Owen Sound, Ont. The Corbet Foundry & Machinery Company are erecting a new building, the North American Furniture Company are starting a new factory and Wm. Kennedy & Sons, manufacturers of iron and steel castings, turbine water wheels, etc., are making important extensions.

The Ontario Motor League suggests that a tax of fifty cents per horse power be imposed on all automobiles in the province, the proceeds therefrom to be appropriated towards the Government grant for good roods, which would raise it from one-third to one-half. A deputation from the league will consult with Mr. W. A. McLean, Provincial Engineer of Highways.

Building permits issued at Moose Jaw, Sask., up to September 20, 1910, represent a total value of $990,790, as compared with $467,390 for the corresponding period of 1909, an increase of more than 100 per cent. Civic improvements at Moose Jaw this season include $395,000 for sewage disposal works, $20,000 for street railways, $140,000 for new telephone system, $40,000 for sidewalks, $20,000 for water main extensions, and $10,000 for improvements at the Exhibition grounds.

Special

Structural Steel Hoist



Designed for erecting Bridges, Office Building, and all other structures of steel.

All four spools work independently, so four lines may be handled separately, while the drums are operating the derrick. Will also propel its own car if required.

Used by the largest Bridge Building Concerns in Canada

Let us send you our catalogue and prices on that Hoisting Engine you are needing.

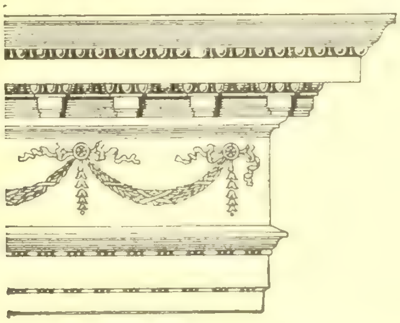
Marsh & Henthorn, Limited
Sales Agents:
Mussens Limited, Montreal, Que.
Belleville, Ont.

A good appearance is a letter of recommendation; a [illegible] well built, a monument to the builder."

—The Philosopher of Metal Town

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

SCANDINAVIA BELTING

For Conveying and Transmission

Whether your Belt Drive is **straight** or **crossed,** conditions **wet** or **dry,** of the air dust laden **Scandinavia Belt** will give you satisfaction.

We can save you money.

Write for Bulletin "A" and discounts.

Federal Engineering & Supplies, Limited
284 Yonge St.
TORONTO

AGENTS: Power Economies Limited, Montreal
Marks-Clavet-Dobie Limited, Port Arthur
McDougall Hardware Co., Ottawa
Great West Saddlery Co., Calgary
Agents Wanted in other Cities

The Original

MARSH-PAUL AIR VALVE

Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our WINDOW GUARDS

Insist on having HARD STEEL WIRE

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone

Company, Guelph

from the hardest substances available

Write the

Corinthian Stone

Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known

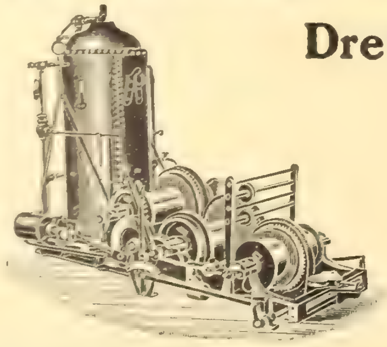
TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada



Dredges - Ditchers - Derricks

Steam Shovels

Steel Dump and Deck Scows

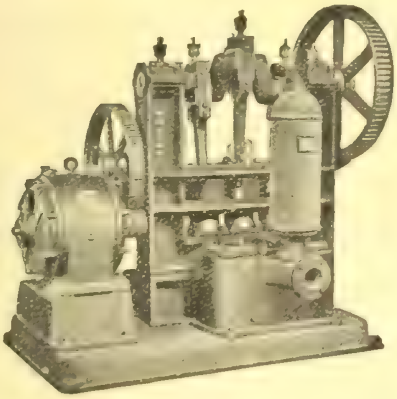
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

"Galvaduct" and
"Loricated"
CONDUITS
For Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Paten
Toronto - Canada

WE HAVE THE STOCK
ready for prompt shipment
Fire Clay
Fire Brick
Cement
Crushed Stone
Building Stone
Building Sand
Gravel, Screened, Pit Run and Pea Gravel
Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North 664, 665 Evenings, North 2167, [illegible]

Goulds Efficient Power Pumps
Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of
GOULDS QUALITY



Goulds Pump Co.
Coristine Building, Montreal
Phone Main 1054
Works: Seneca Falls, N.Y.

An Expert Engineer Said:
"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."
(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)
"The Best Paving Block Made"

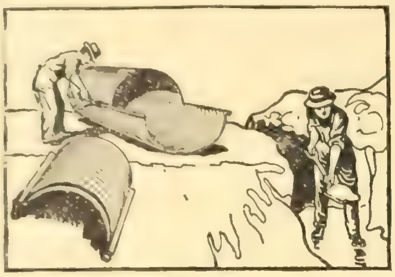
Daily Capacity 500,000
Every time "Metropolitan Block" are adopted it is the initial proceeding for a permanent pavement.
The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

WE MANUFACTURE
HOUSE TRIM Pine and Hardwood
Special attention given to
Chestnut Trim
Estimates promptly given for quick and good work
The Tillson Co., Limited
Tillsonburg, Ont.

Builders' and Contractors' Supplies
Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE —Dimension and Coursing Stone, Lime
FIRE BRICK IVORY CEMENT PLASTER
Yards
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.
The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

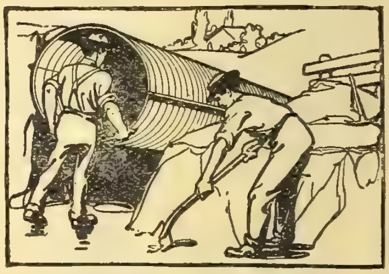
Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.



PEDLAR
NESTABLE GALVANIXED
CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivalled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert. Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

HALIFAX
16 Prince St.
CHATHAM
200 King St. W.

LONDON
86 King St.
QUEBEC
127 Rue du Pont

WINNIPEG
76 Lombard St.
REGINA
1901 Railway St. S

MONTREAL
321-3 Craig St.
CALGARY
1112 First St. W.

PORT ARTHUR
45 Cumberland St.
VICTORIA
434 Kingston St

OTTAWA
423 Sussex St.
ST. JOHN, N.B.
42-46 Prince William St.

TORONTO
111-113 Bay St.
VANCOUVER
821 Powell St.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Offices:
Nos. 346 and 348 Broadway, NEW YORK CITY U.S.A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont. London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N B.; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS C IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis,
(Taylor & Gordon)

Architects

North British & Mercantile Chambers,
80 St. Francois Xavier St., Montreal
Telephone Main 281.

BANK
OFFICE
SCHOOL
CHURCH
& OPERA
LODGE
FURNITURE
MANUFACTURED BY
CANADIAN OFFICE-SCHOOL FURNITURE CO. LTD.
PRESTON — ONTARIO

Harry Allen Jacobs.
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phones: Office 1217
Yard 4507

Sand & Supplies, Ltd.

TORONTO

Are You Interested in Good Brick?

Do you want to be known as a fellow who always uses the best? Then in future see that you specify

"Port Credit" Brick

It's strong, durable and has a rich red color that will please you beyond all expectations.

We are armed for Fall Orders

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

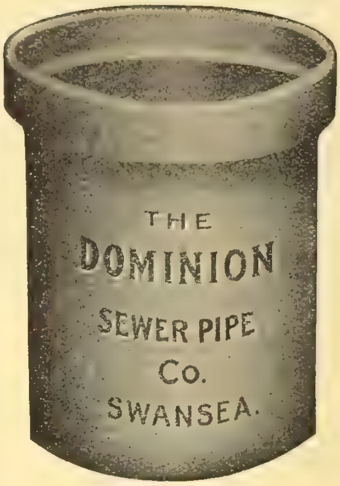
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDERS GAZETTE
VANCOUVER
Builders' Supplies
HYDRATED LIME
JOHN GUNN & SONS
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.
General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed
Sewer Pipe
in the WORLD

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW,
President.

R. H. NEW,
Vice-President.

It Pays To Pay For Quality

After 50 years in business we are thoroughly convinced that the Engineers, Contractors and dealers throughout Canada are united in their opinion on this question.

HAMILTON
Salt Glazed Vitrified
Sewer Pipe

is the hightest quality of Sewer Pipe sold in Canada.

Combined with quality we pay special attention to delivery, our prices are always within the market.

In every district throughout Canada we have Customers who will gladly verify these statements.

ARE YOU CONCINCED?

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Do You Think
that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy
or any kind of
Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

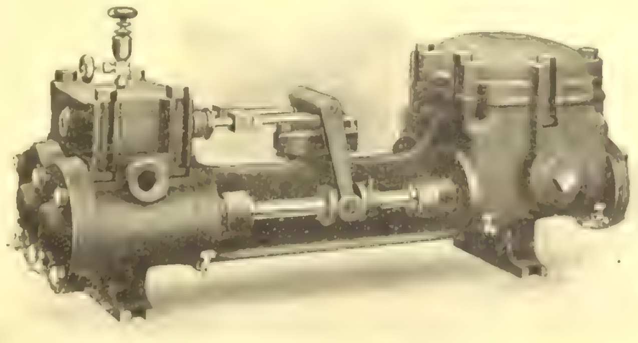
Duplex Steam Boiler Feed Pumps

In design and construction, our new Standard Duplex Pumps conform to the latest and most approved practice, and in addition include a number of special features of merit described in our Bulletin No. 36. :: ::

Full Stroke
under all
conditions.

Reliable in
Service.

Compact in
Design.



Canada Foundry Company, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

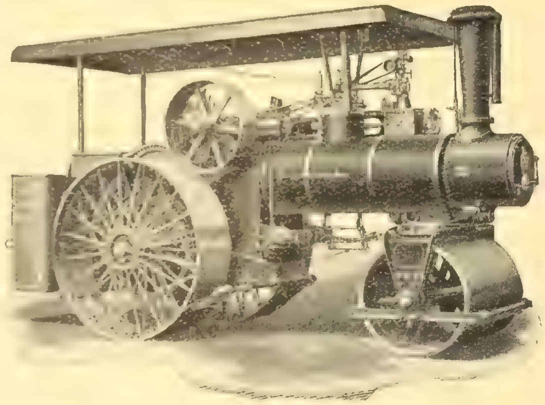
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

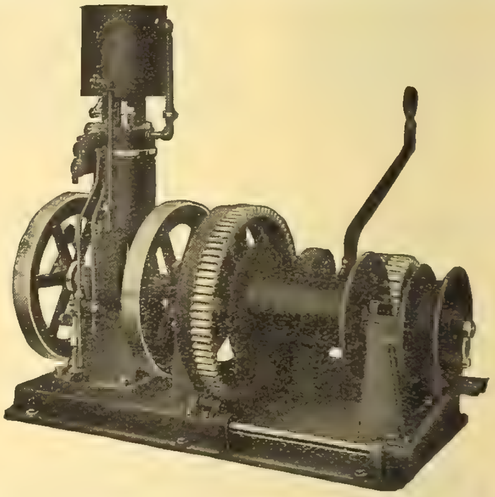
J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Contractor's Hoisting Engine



We have always on hand Builder's Material Elevator, which work in connection with this Hoisting Engine. Can make immediate shipment.

It will pay any Contractor to investigate the merits of this Hoisting Engine and Material Elevator of which we have a great many in use.

FOR PRICES AND PARTICULARS APPLY

Climax Road Machine Co.

Hamilton, Ont.

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

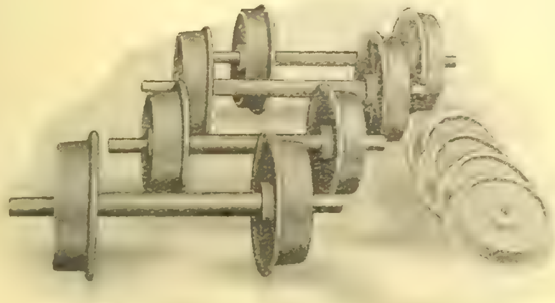
Manufacturers

Flexible and Flange Pipe,
Special Castings and all kinds of
Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Hamilton, Ont.
Three Rivers, Que. Midland, Ont. Londonderry, N.S.
St. Thomas, Ont. Fort William, Ont.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE
The Ready Mixed
Hard Wall Plaster
Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver
Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established 1882
THE COMMERCIAL
The Weekly Financial Commercial & General Trade Newspaper of the Great West.
Winnipeg Manitoba

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

Continental Life Bldg. TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, **Vancouver, B. C.**

The John Galt Engineering Co.

**Consulting, Civil and
Sanitary Engineers**

General Municipal Engineering

Specialties: { **Waterworks, Sewerage
and Electric Lighting.**

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Reid & Brown

**Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock**

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

**VACUUM STEAM HEATING
and DRYING SYSTEMS**

Canada Office, 72 King St., E, **Toronto, Ont.**
Phone Main 1907

Queen City Foundry Co., Ltd.

**Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.**

67 Esplanade E.,

Phone Main 7692 **Toronto, Ont.**

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

**Building Granite, Granite
Setts, Curbing, Etc.**

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.

Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto —

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i........	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to colo., 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off, lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends 50 per cent

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch.... .	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $9.00, bags extra; sanded, $5.00; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, 94 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 91 cents per gallon of 9 lbs.
Turpentine, in barrels, 89 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

THE IMPORTANT THING FORGOTTEN

"Giles," said De Whizz to his chauffeur, before he started on his run, "have you oiled the machine thoroughly?"

"Yes, sir."

"Are you sure, Giles?"

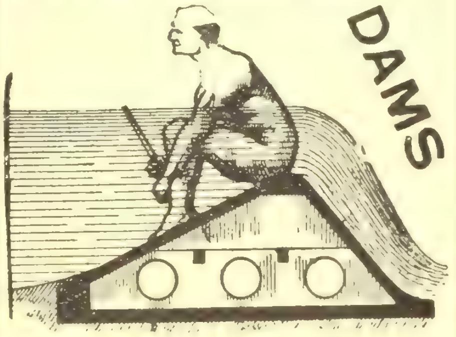
"Yes, sir; I have filled the spring cups and the engine reservoir, and I have greased the [illegible] piston, the [illegible] union, the exhaust pipe, the muffled [illegible], the [illegible], the [illegible], and both the hot boxes."

"Are those all the parts you have oiled, Giles?"

"Yes, sir."

"You have forgotten the most important place of all. Take the can and squirt a few drops of oil on the license number, so that the dust will collect on ti and make it hard to read. Always remember to lubricate the license number, Giles."

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



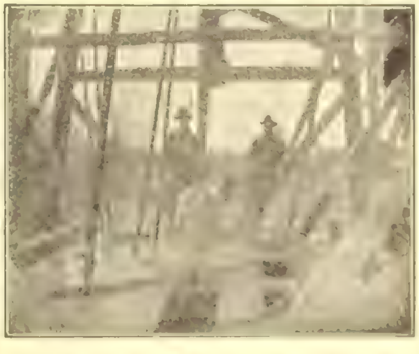
AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry, Galt, Ont.

Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD



Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

New Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

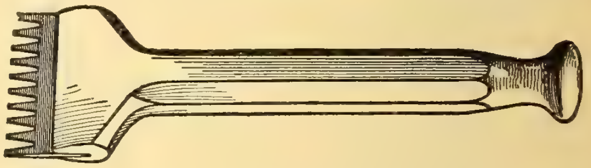
Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co.
Limited
Woodstock, Ont.



The
"Simplex" Stone and Marble Cutter

No need of carrying a heavy load of tools. Use "Simplex" handles with adjustable cutters. Cheaper than sharpening and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"

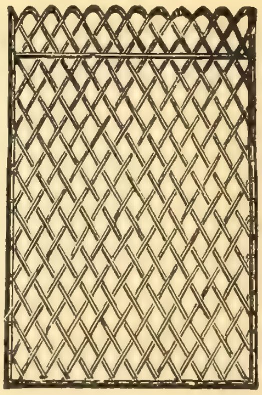
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

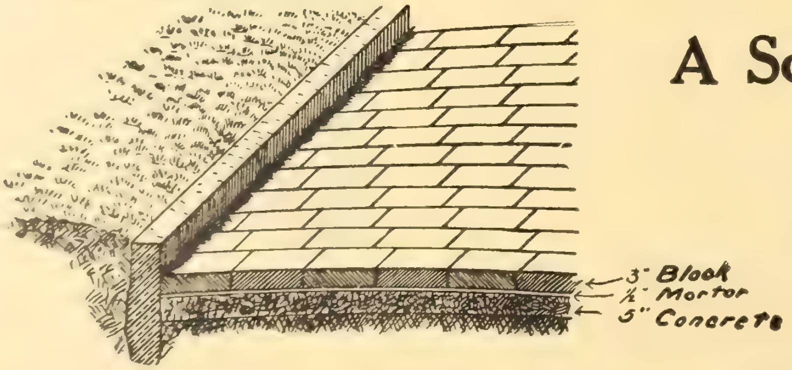
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

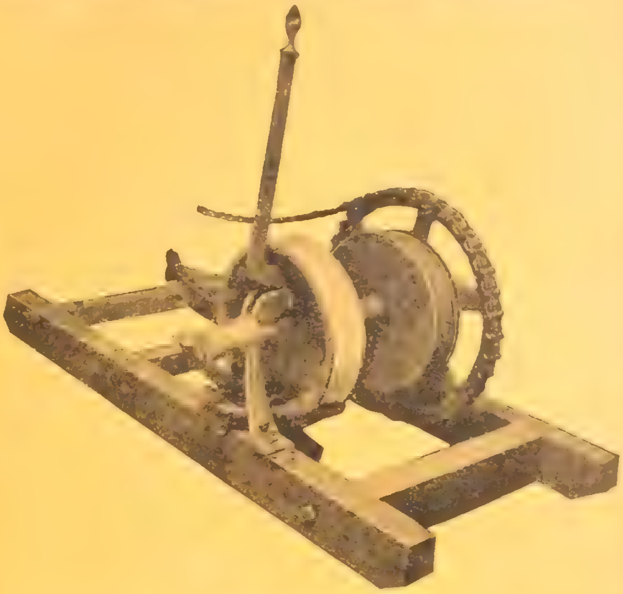
We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited
Engineers and Machinists
London, Canada

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

We Manufacture

Frames - Sash - Doors

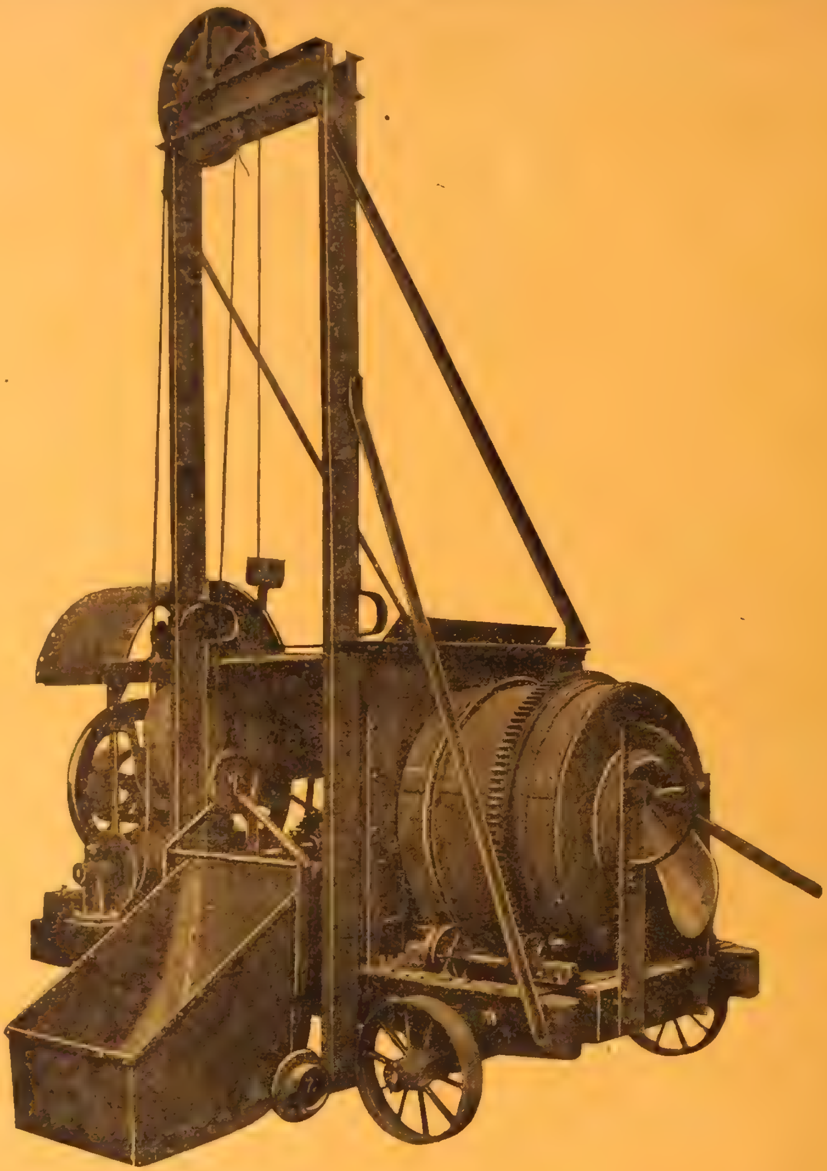
House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



Ransome Street Concrete Mixer

The above cut illustrates our Street Concrete Mixer, designed especially for handling concrete quickly and efficiently. Three batches of materials are handled at the same time, but independently of one another. No delay whatever, a continuous stream of concrete is discharged, but each batch is mixed separately. No poor concrete—every particle well mixed.

Four of these mixers are being used by Messrs. Laurin & Leitch, Contractors, Montreal.

Let us send you free particulars and prices.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

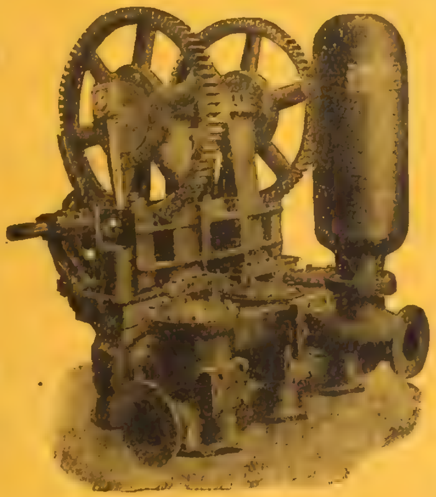
Vol. 24 Toronto, October 26, 1910 No. 43

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and
Steam
Pumps
Condensers,
Travelling
Cranes, etc.



WRITE FOR CATALOGUE

The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

Large Bent Plate Glass for Shop
Fronts a Specialty

The Toronto Plate Glass Importing
Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

"Redcliffe"

TRADE MARK
REDCLIFFE

Corrugated Iron

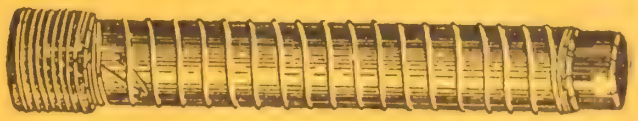
The most popular Corrugated Iron in Canada

SOFT LIGHT

ALWAYS RELIABLE

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems,
Fire Protection, Power Plants,
Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—
and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

The Canadian Boving Co.

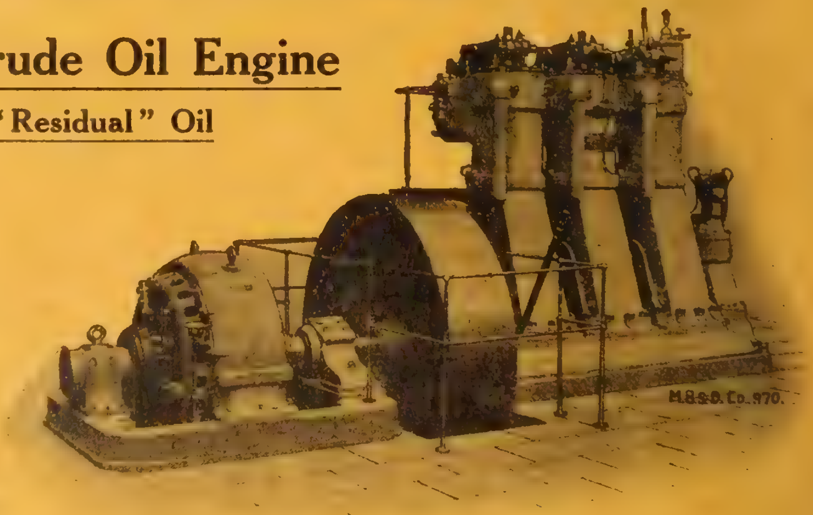
164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings



The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear	No Vapourizer
No Producer	No Boiler
No Chimney	Self Contained

Continuous Running
No Breakdown
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canada Wire Goods Mfg. Co. 57
Dennis Wire & Iron Works 10

Belting

Federal Engineering & Supplies, Ltd 55

Boilers

Inglis, John 24
Jenckes Machine Co 2
Leonard & Sons, E 63
Marsh & Henthorn 55
McDougall Caledonian Iron Works 33
Mussens Limited 34
Taylor-Forbes Co
Waterous Engine Works Co. 22

Brick

American Enamelled Brick Co.
Canadian Pressed Brick Co. 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co. 22
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co. 36

Bridges (Steel)

Canadian Bridge Co 18
Cleveland Bridge Co. 18
Dickson Bridge Works
Dominion Bridge Co. 18
Phoenix Bridge and Iron Works 19
Pennsylvania Steel Co. 18

Builders' Hardware

Taylor-Forbes Co.

Cement

Alsen Portland Cement Co. 66
Britnell & Co 56
Bremner, Alex 63
Canada Cement Co 3
McNally & Co., W. 59
Morrison & Co., T. A. 64
Rogers, Alfred 4
Rogers Supply Co. 33
Sand and Supplies 59

Conduits Page

Conduits Co., Limited 56

Concrete Mixers and Machinery

Canada Foundry Co. 61
Cropp Concrete Machinery Co. 6
Goold, Shapley & Muir 9
Hopkins & Co., F. H. 68
Jenckes Machine Co. 2
London Concrete Machinery Co. 23
Mussens Limited 34
Morrison & Co., T. A. 64
Rogers Supply Co. 33

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co. 65
Buffalo Steel Co.
Canada Wire Goods Mfg. Co. 57
Hamilton Iron & Steel Co. 36
Trussed Concrete Steel Co. 5

Contractors' Plant

Beatty & Sons, M. 57
Factory Products Limited
Hepburn, John T. 17
H. & E. Lifting Jack Co. 19
Hopkins & Co., F. H. 68
Katie Foundry Co. 65
Marsh & Henthorn 55
Mussens Limited 34

Crushers (Stone and Rock)

Hopkins & Co., F. H. 68
Jenckes Machine Co. 2
Mussens Limited 34
Morrison & Co., T. A. 64

Corrugated Iron

Galt Art Metal Co. 20
Metallic Roofing Co. 55
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 5
Roofers Supply Co. 63

Contractors Page

McIlwraith, Jas. A. 64

Drills

Beatty & Sons, M 57
Canadian Rand Co. 1

Deafening Felts

Cabot, Samuel, Inc. 59

Drilling Contractors

Harvey, J. 65

Dredges

Beatty & Sons, M 57

Engines

Canadian Boving Co. 2
Inglis, John 24
Jenckes Machine Co. 2
Leonard & Sons, E. 63
Mussens Limited 34
Waterous Engine Works Co. 22

Excavators

Harris, J. W. 11

Electrical Apparatus and Supplies

Factory Products Limited
Northern Electric & Mfg. Co.

Engineers (Civil and Mechanical

Barber & Young 64
Chipman & Power 64
Bowman & Connor 64
Farmer, John T. 64
Fuce, Edw. O. 64
Galt Engineering Co., John 64
Glaubitz, H. J. 64
Hunt & Co., Robt. W. 59
Inglis, John 24
Kennedy, Jas. C. 64
Lea & Ferguson 64
Mace, T. Harry 64
Mitchell, C. H. 64
McRae, John B. 64
Moore & Scollan 64
Nadel & Adler 64

Fire Apparatus Page

Factory Products Limited
Morrison & Co., T. A. 64
Seagrave, W. E. 16

Fireproof Doors and Windows

Douglas Bros. 14
Mussens Limited 34
Ormsby, A. B. 5

Granite and Marble

Laurentian Granite Co. 64
Missisquoi Marble Co. 12
Rogers Supply Co. 33
Smith Marble & Construction Co. 58

Glass

Chance Brothers & Co.
Consolidated Plate Glass Co.
Luxfer Prism Co.
Thompson & Co., B. & S. H.
Toronto Plate Glass Importing Co. 1

Heating Apparatus

Jenckes Machine Co. 2
Leonard & Sons, E. 63
Taylor-Forbes Co.

Hoisting Machinery

Beatty & Sons, M. 57
Factory Products Limited
Inglis, John 24
Jenckes Machine Co. 2
Hopkins & Co., F. H. 68
Marsh & Henthorn 55
Mussens Limited 34
Scott Machine Co. 61

Hydrants

Canada Iron Corporation 63
Gartshore-Thomson Pipe Co. 62
Kerr Engine Co. 21

Lime

Christie, Henderson & Co. 17
Jamieson Lime Co. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

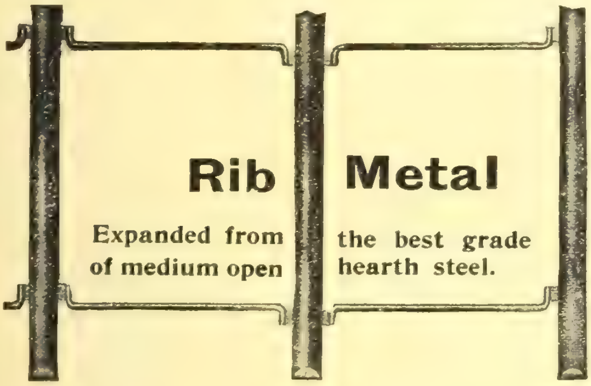
ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.


Rib Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

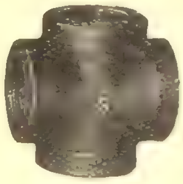
Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

These are Right

ELBOW

TEE


CROSS

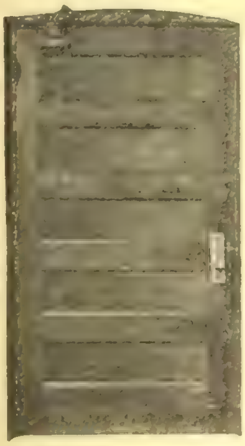
IF THERE IS AN
S ON THEM **S**

We manufacture and stock a full line of Screwed and Flanged Cast Iron Fittings.

Send for a Catalog

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

For Apartment Houses and Office Buildings



or any building where appearance is a consideration. Our KALAMEINED CLAD FIREPROOF DOORS have the artistic appearance and at the same time give Fire Protection. **We make them by machinery**, the wood and the iron become practically one. There is no bulging. They can be finished to any detail with trim to suit and they **mean a reduction in Insurance Rates.**

Let us give you an approximate figure

A. B. ORMSBY, Limited

Factories:

Cor. Queen & George Sts. TORONTO	677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	10
DeLaplante, Ltd.	23
Eaton & Sons, J. R.	23
Georgian Bay Shook Mills	67
Rhodes Curry & Co	62
Seaman Kent Co	66
Siemon Bros.	61
[illegible] Co	20
Woodstock Lumber Co	66

Metal Lath

Galt Art Metal	20
Metallic Roofing Co.	55
Noble C. W.	20

Meters

Hopkins & Co., F. H.	68
Neptune Meter Co.	57

Paving and Paving Materials

Dominion Carbolineum Works	8
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	66
Silica Barytic Stone Co., of Ontario	65

Plaster

Albert Mfg. Co.	
Britnell & Co	56

Pipe

Canadian Pipe Co.	62
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	62
Municipal Construction Co.	16
National Iron Works	63
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel, Inc.	59
Glidden Varnish Co.	
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery

Beatty & Sons, M.	57
Goulds Pump Co.	
Hopkins & Co., F. H.	68
Inglis Co , John	24
Leonard & Sons, E.	63
Martin Steam Pump Co.	67
McDougall Caledonian Iron Works, John	33
Mussens Limited	34
Ontario Wind Engine & Pump Co.	61
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	22

Roofing Materials

Barrett Mfg. Co.	
Galt Art Metal Co.	20
Metallic Roofing Co.	55
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	33
Roofers Supply Co.	63

Railway Supplies

Factory Products Limited	
Gartshore, John J.	64
Hopkins & Co., F. H.	68
Mussens Limited	34

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	62
Climax Road Machine Co.	21
Morrison & Co., T. A.	64
Mussens Limited	34

Sewer Pipe

American Sewer Pipe Co.	60
Britnell & Co	57
Canada Iron Corporation	63
Dominion Sewer Pipe Co.	60
Gartshore-Thomson Pipe Co.	62
Hamilton & Toronto Sewer Pipe Co.	61
National Iron Works	63
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	33
Standard Drain Pipe Co.	60

Sand

Rogers Supply Co.	33
Sand & Supplies	59

Stone

	Page
Britnell & Co.	56
Christie, Henderson & Co.	17
Consolidated Stone Co.	56
Contractors' Supply Co.	20
Corinthian Stone Co.	57
Crushed Stone, Limited	59
Doolittle & Wilcox	63
Hagersville Contracting Co.	5
Laurentian Granite Co.	64
Maloney John	19
Morrison & Co., T. A.	64
Myers, Oakley	59
Rogers Supply Co.	33
Roman Stone Co	17
Sackville Freestone Co.	11
Sand and Supplies	59

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	18
Eastern Canada Steel Co.	15
Hamilton Iron & Steel Co.	36
MacKinnon Holmes & Co.	19
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	64
Reid & Brown	64
Salter, W. H	19

Shovels (Steam)

Beatty & Sons, M.	57
Hopkins & Co., F. H	68
Mussens Limited	34

Shingle Stains

Cabot, Samuel, Inc.	59

Slate

Roofers Supply Co.	63

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Smoke Stacks

Leonard & Sons, E.	63

Safes and Vaults

	page
Taylor, J & J	

Stone Cutters

Bailey-Underwood Co.	66

Sheathing Papers

Cabot, Samuel, Inc.	59

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	58

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	63
Marsh & Henthorn	55
McDougall Caledonian Iron Works	33
Ontario Wind Engine & Pump Co.	19

Valves

Canada Iron Corporation	63
Gartshore-Thomson Pipe Co.	62
Kerr Engine Co.	13
Marsh & Co, Jas.	56
Standard Fitting & Valve Co	5

Ventilating System

Gardiner & Gaskill	61

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	59

Wire Rope

Dominion Wire Rope Co.	68
Greening Wire Co., B.	66
Smith, Thos. & Wm.	

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	57

Water Wheels

Canadian Boving Co.	2

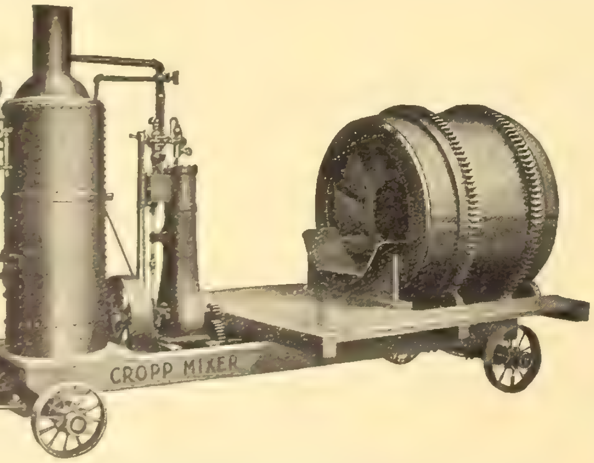
Wire and Cable

Factory Products Limited	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co.,

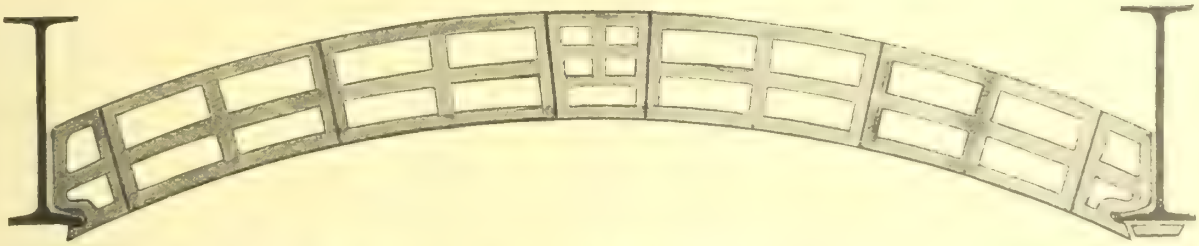
84 Lasalle Street,
Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

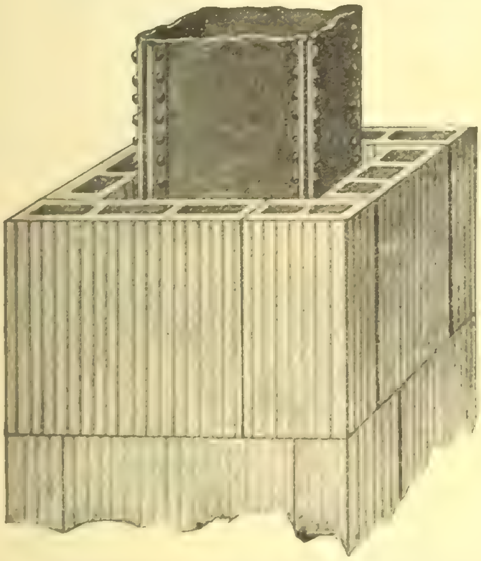
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

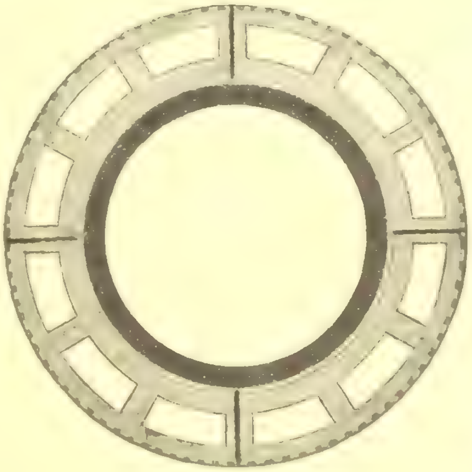


Section showing style of Skewbacks and Keys

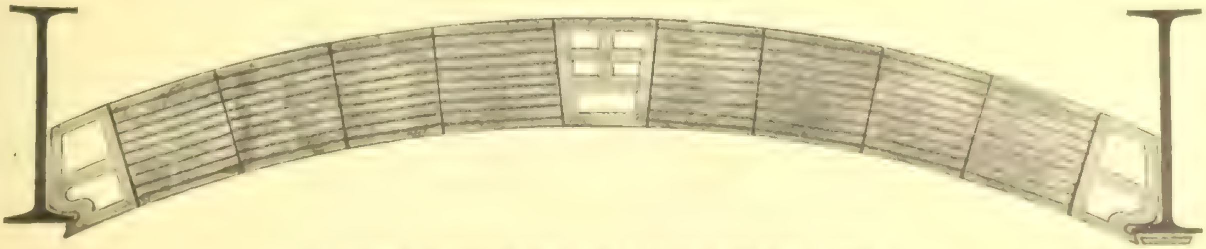


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



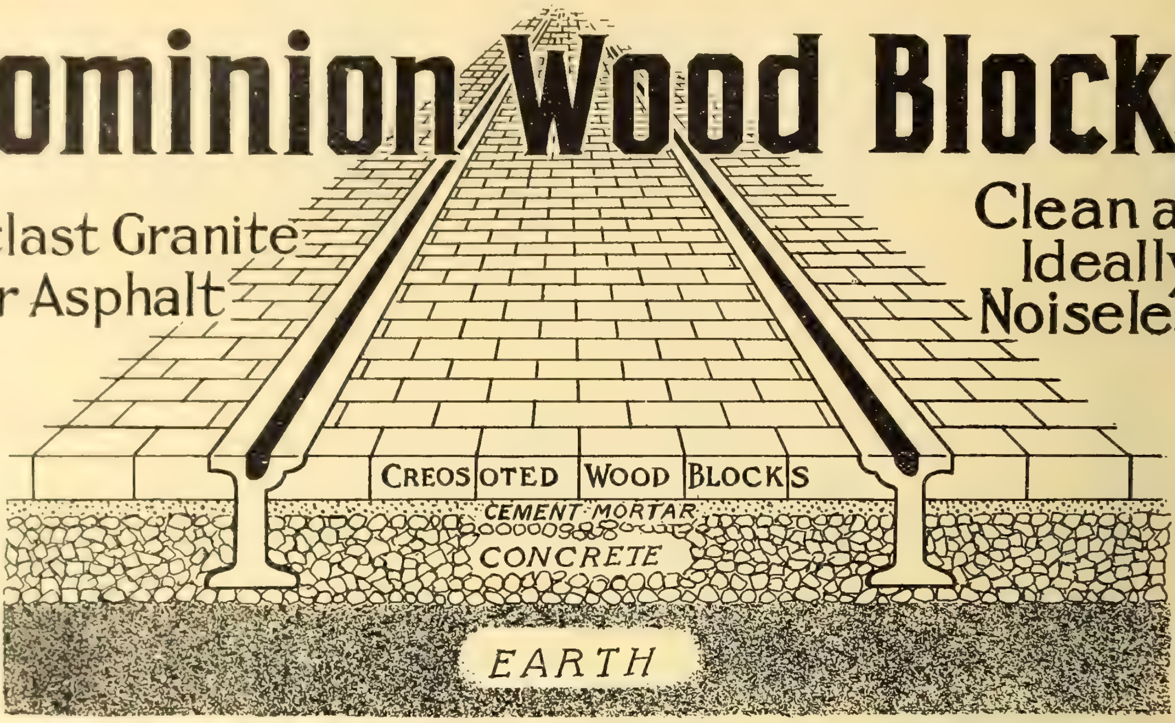
Section showing style of Skewbacks and Keys

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Dominion Wood Blocks



Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless

Dominion Wood Blocks make an ideal pavement.

Owing to the elasticity of the wood they will not pulverize.

Make relaying after excavating for water connections etc. easy and inexpensive.

Impervious to water.

Noisless as tan bark.

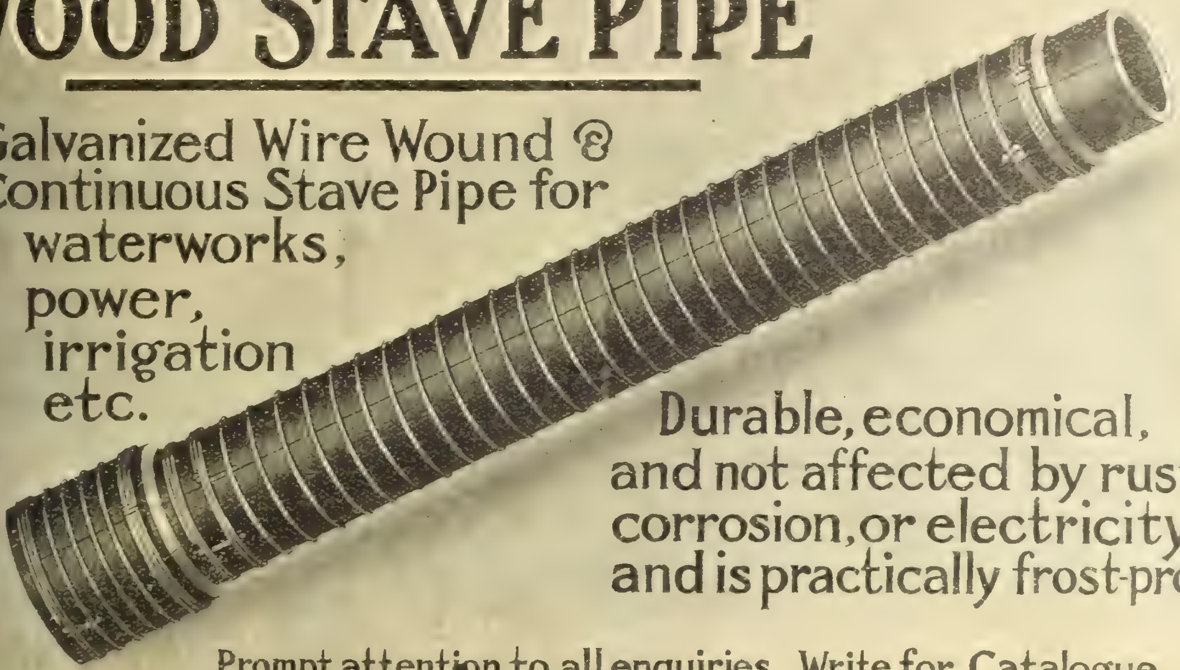
Impregnated with creosote which prevents decay.

Outlast asphalt or brick pavement.

Native live Douglas Fir logs used for their manufacture.

Dominion Carbolineum Works
Vancouver, B.C.
LIMITED

WOOD STAVE PIPE



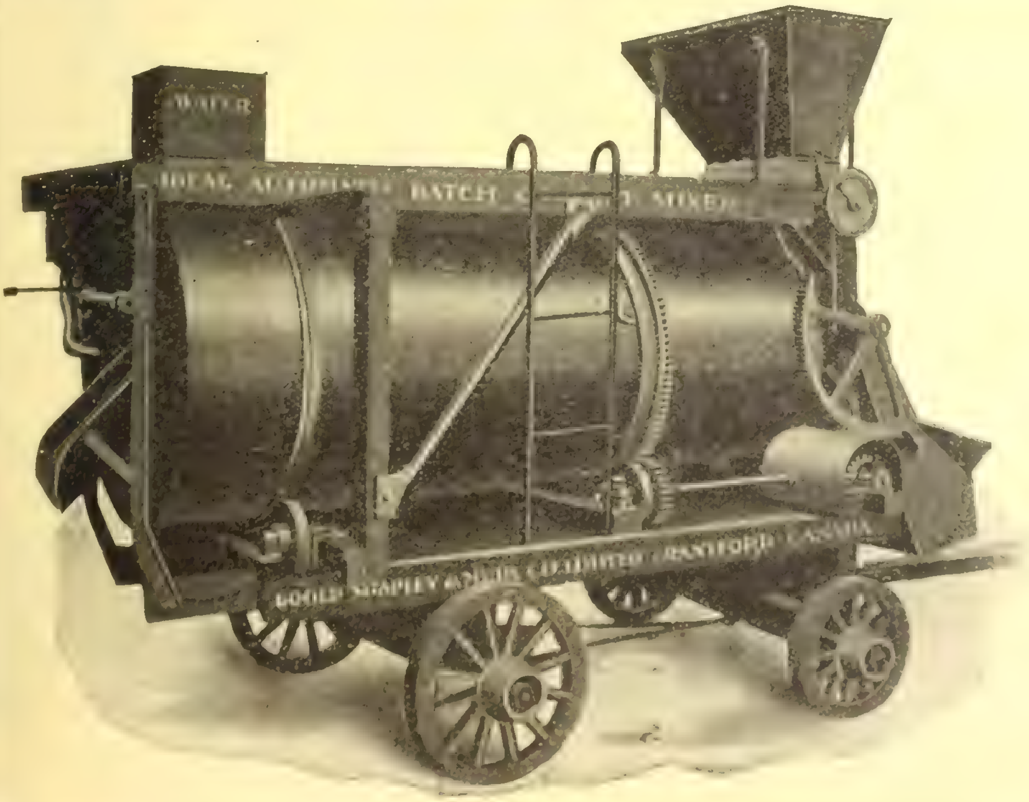
Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer


WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

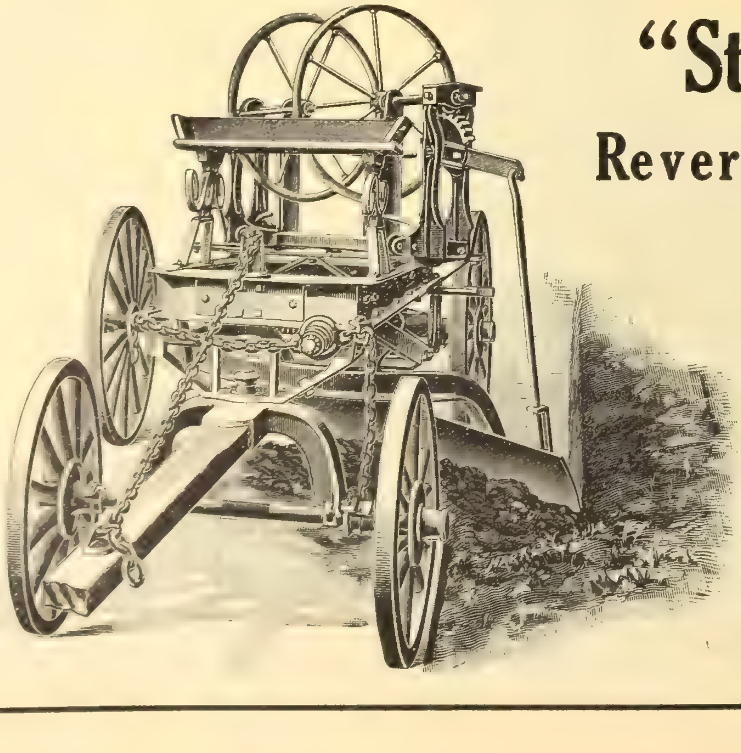
Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a

"Steel Champion"

Reversible Road Machine

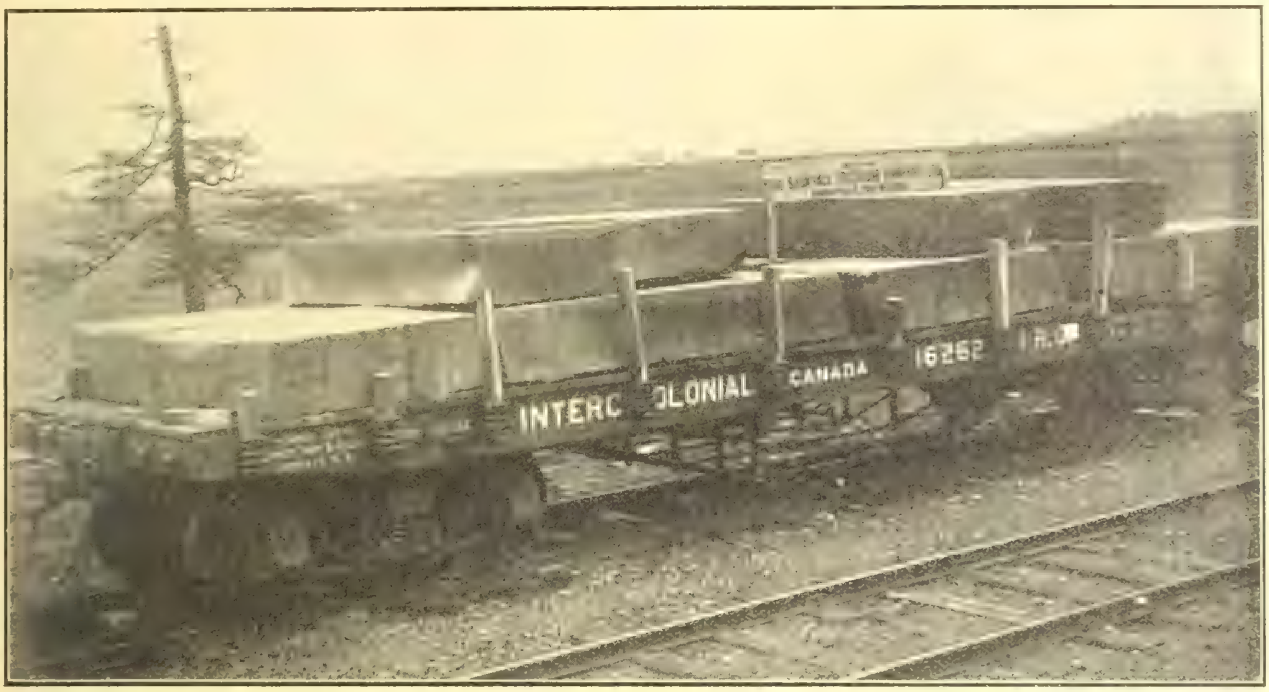


This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery



Block Stone
Head Sills

Dimensions
Shoddy

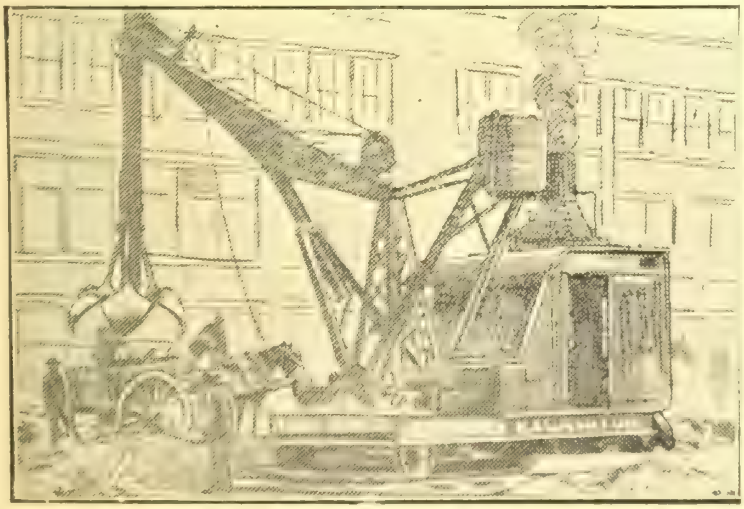
Random
Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Marble Exteriors

These have not become nearly so general in the Canadian cities, up to the present, as they are in Europe and the United States, partly because of the great cost of imported marble, partly because of the difficulty and delay in delivery.

These difficulties are, however, now entirely removed. Our beautiful light grey marble is being sold at a price which makes marble a material of general availability.

Our new plant, giving us a total equipment of 18 gang saws, besides circular saws, rubbing beds, planers, lathes, carborundum machine, pneumatic tools, electric cranes, etc., puts us in a position to finish 2,000 cubic feet of material every week.

The test of the material made at McGill University, showed a resistance of 22,000 lbs. to the cubic inch, a strength equal to the best grades of granite. The absorption test was very low.

We have put in several moderate sized exterior jobs, which have given the architects and owners entire satisfaction.

Our method is to furnish the material, all finished, ready for setting, f.o.b. car at any desired destination.

We are always pleased to make up prices.

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**
85 Sparks Street, Ottawa, Ont.

District Sales Agents :

Bosse & Banks, Quebec, Que.
Jas. Robertson & Co., St. John, N. B.
Walker & Barnes, Edmonton, Alta.
G. R. Duncan, Fort William, Ont.

Eadie-Douglas Co., Toronto, Ont.
General Contractors' Supply Co., Halifax, N.S.
Wm. N. O'Neil & Co., Vancouver, B.C.
C. N. Barclay, Winnipeg, Man.

Satisfaction With

IRON

BODY

GATE

VALVES

K E R R

We have been making "Kerr" valves and hydrants for a long time and know what a good valve is.

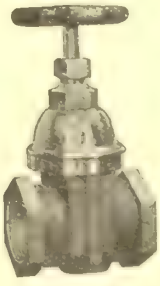
The many cities and towns throughout the Dominion that have used our goods say they are very satisfactory.

If your town or city intend making extensions or installing a new system of waterworks it will pay you to specify "Kerr" goods.

Their value has been proved by long and satisfactory service.

V A L V E S

Compression Hydrant



"Weber" Gate (Brass)

Hub End Gate

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

PERMIT US TO REMIND YOU

that

MIMICO PIPE

makes the

SEWER SURE

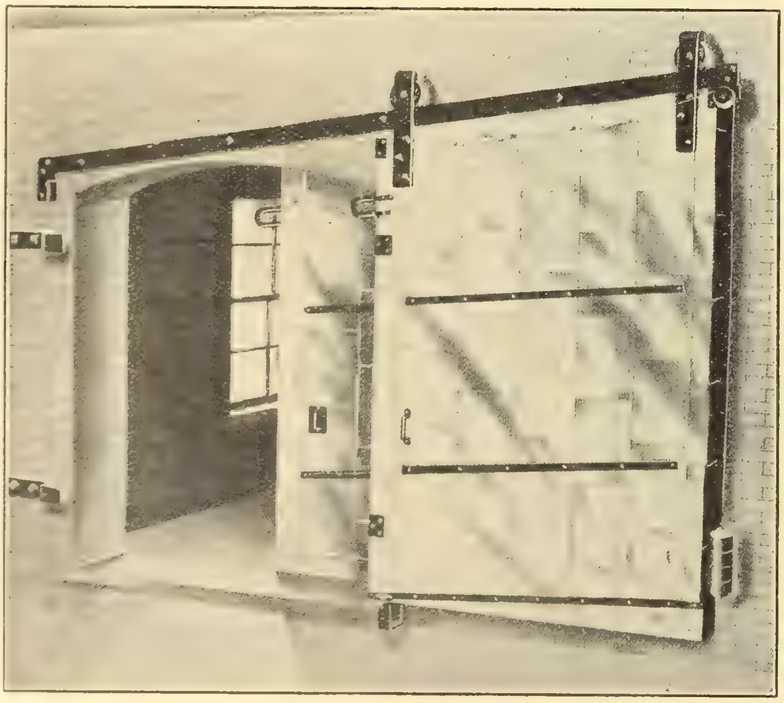
and

IT IS BETTER TO BE SURE THAN SORRY

Sizes 4" to 24" inclusive

Manufactured by

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones: Toronto Connection, Parkdale 422, Evenings and Holidays, Park. 3888 and 3889



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P. Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction

Manufacturers of

Wire-Wound Stave Pipe
and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

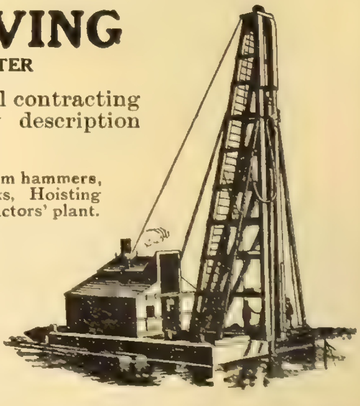
PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

John T. Hepburn

Derricks, Cranes and Winches

We manufacture Winches, Cranes and Derricks for all purposes, and in all sizes

Scotch Derricks
Overhead Cranes
Foundry Cranes
Warehouse Cranes
Crab Winches

They are made outright in our own shops. They have been tested under all conditions, in all parts of the Dominion. They are right in every detail.

We are glad to quote for anything in this line

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges and Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

Bridge and Construction Dep't.

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P. [illegible]

Steel and Wood **TANKS**

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

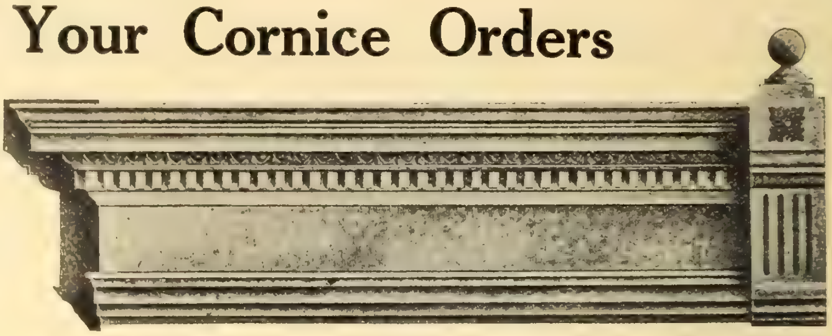
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company Montreal

Send Us Your Cornice Orders

"Galt" Galvanized Iron Cornices are made on a 1909 model Ohl Power Press by men with years of international experience in this line. They fit accurately.

Prices right. Deliveries prompt. Let us quote on your requirements in **Cornice, Skylights or Fire-proof Windows.**



The Galt Art Metal Co., Limited, Galt, Ontario

This space is ordinarily used to explain the advantages of

Herringbone Metal Lath

It is useless now. We have been running day and night for several weeks past and the orders are still gaining on us. When our new machinery is installed we will again explain why **Herringbone,** which is not the cheapest metal lath on the market, is such a favorite among close figuring contractors. At present we are merely holding this space.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

WE MANUFACTURE

HOUSE TRIM Pine and Hardwood

Special attention given to

Chestnut Trim

Estimates promptly given for quick and good work

The Tillson Co., Limited
Tillsonburg, Ont.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

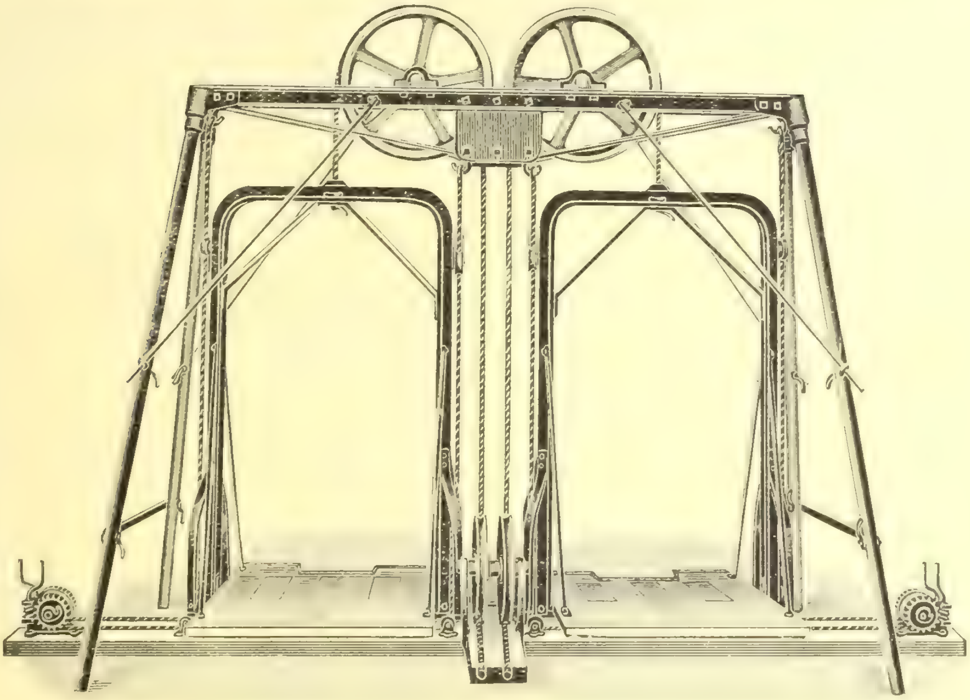
—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto **Tel. M. 6859**

Contractors and Builders Attention!

If you would increase your profits purchase a

Climax Material Elevator



With a **Climax Material Elevator** the upper stories of a building can be built at but a trifle greater expense than the ground storey, and the time occupied in putting up the building is decreased to about one-third, enabling the contractor to erect a greater number of buildings during the building season. The first cost of a machine cuts but a small figure when divided up on a very few contracts. We can also supply this style of elevator with single platform, which will carry two barrows.

Testmonial received from Mr. Edward Webb, Orillia, who purchased a **Climax Material Elevator and Hoisting Engine** one year ago :

TO WHOM IT MAY CONCERN :—This is to certify that we purchased a **Climax Hoisting Machine** with a four horse power gasoline engine attached, also one complete **Climax Material Elevator** with two platforms. Same has been installed in our contract—the Tudhope new factory now under course of construction. We find that this hoist will take up material fast enough to keep thirty (30) bricklayers supplied with material. The machine has so far proven most satisfactory.

Yours truly,

Sgd. Edward E. Webb.

FOR CALALOGUE APPLY

Climax Road Machine Co.

Hamilton, Ont.

THE
MILTON
PRESSED BRICK Co.
LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

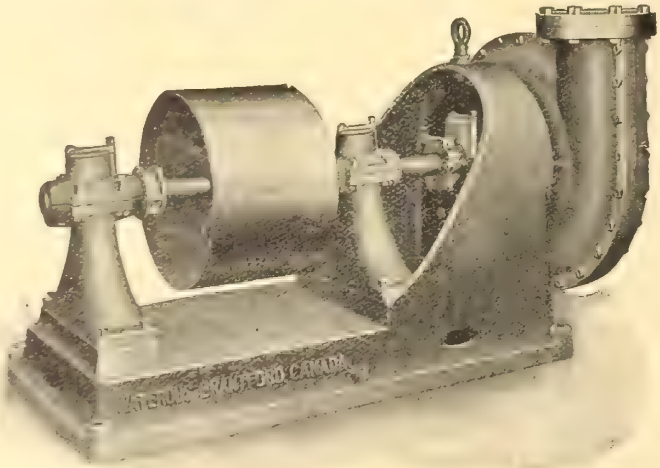
Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

THE

CONTRACTOR'S PUMP



We have designed a pump in which Simplicity, Strength, Durability and Compactness are combined, and which is specially adapted for general contracting purposes.

It will not clog up, will run every minute of a ten hour day, and can be left to the care of an unskilled laborer without going to pieces.

Built in sizes with discharge openings from four to fourteen inches. Can be belt, engine or motor driven, in Vertical or Horizontal styles.

Write for our complete Pump Bulletin No. 200.

Fully Illustrated

NOTICE THE SPLIT-BASE!

The Waterous Engine Works Co., Ltd. Brantford, Canada

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

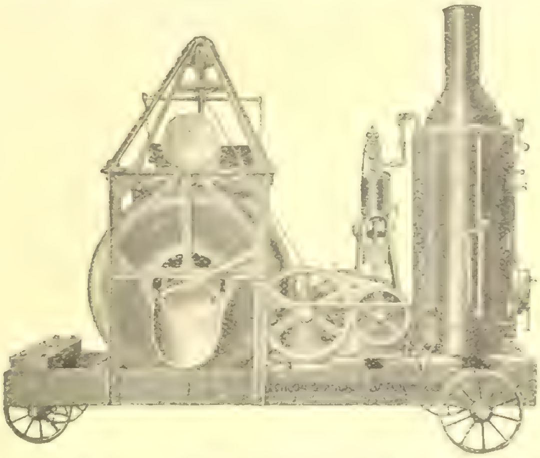
This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada



London Standard Drum Batch Concrete Mixer

Made in several sizes and with any equipment. This machine embodies the latest improvements in Batch mixers and is second to no other machine. Send for catalog stating capacity required.

We ALSO MANUFACTURE the now famous LONDON AUTOMATIC BATCH MIXERS Nos. 1 and 2, also Face-down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machine, Hand Drain Tile Machine, Sill and Lintel Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada **Limited**

Manitoba Branch:	Agent for Nova Scotia:	Agent for B. C.:
W. H. Rosevear, Agent, 52½ Princess St., Winnipeg, Man.	Geo. B. Oland & Co. 28 Bedford Row, Halifax, N. S.	A.G. Brown & Co., 1048 Westminster Ave., Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

Hardwood Flooring

Those who use

"Empire Brand"

are delighted with its perfect finish and elegant appearance and will use no other. Only the best lumber is used. We are equipped and have the workmen to turn out the highest class of "hardwood flooring" on the market.

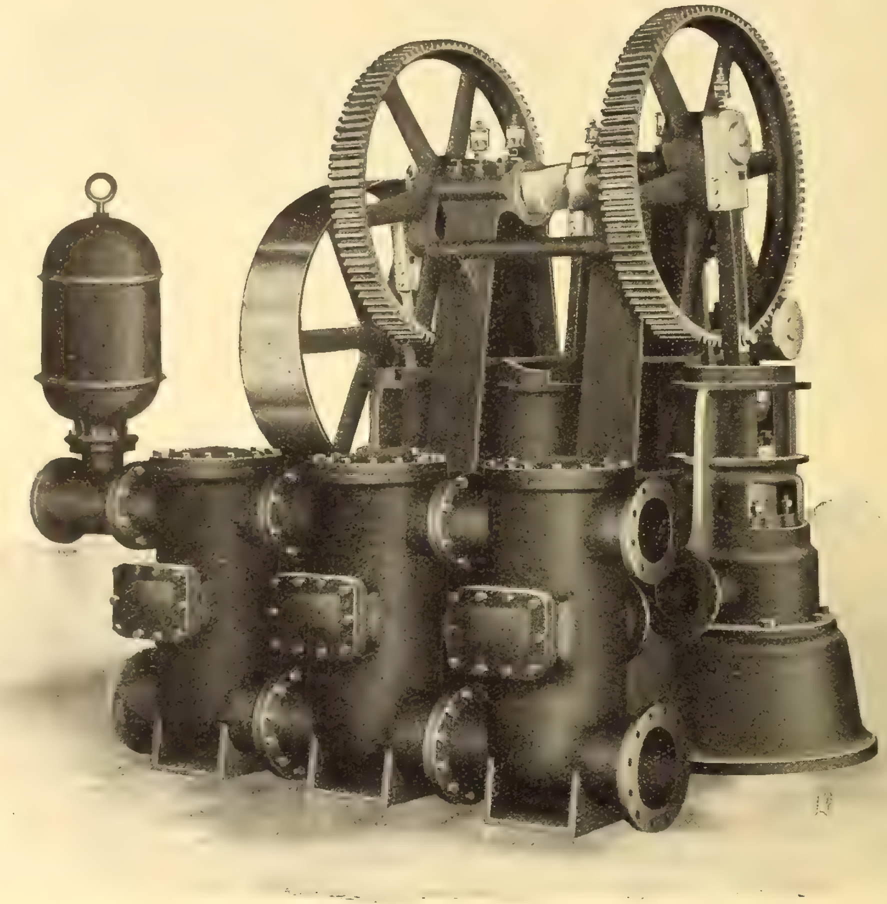
J. R. Eaton & Sons

Limited

Orillia, Ontario

Montreal Agent: C. I. SPENCER, 55 St. François Xavier S

Special Machinery



10¾ in. x 12 in. Single Acting Triplex Plunger Pump.

Our Plant and Equipment are modern and up-to date in every respect—and as a consequence we are enabled to promptly execute all orders for Plate Work, Pumps, Pumping Machinery, Engines, Boilers of all kinds.

We have just made and installed four (4) of the above pumps for the T. Eaton Co'y, Limited, Toronto. We do all kinds of repair work including ship repairs.

Give us an Opportunity to Serve You

The John Inglis Company Limited

ENGINEERS AND BOILERMAKERS

Sole Canadian Manufacturers of Erie City Water Tube Boilers, Vertical and Horizontal

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.

The council decided to put asphalt pavement on Front street and a sewer on Front between Victoria avenue and Dundas streets.

Biggar, Sask.

It is proposed to expend about $15,000 for waterworks improvements. J. Lukey, city, secretary-treasurer.

Brandon, Man.

The ratepayers will vote at an early date upon a waterworks by-law to issue $50,000.

Chilliwack, B.C.

Immediate steps will be taken towards the acquiring of water rights on Ford creek. On the granting of this, a company will be organized to install a system of waterworks to provide Rosedale with water for domestic and fire purposes.

Esquimalt, B.C.

It is announced that Mr. James Dunsmuir will advance the money on bonds, thus giving this district the opportunity to install a sewerage system. J. A. Mohun, Messrs. J. Jardine, M.P.P., and H. Pooley waited on the government.

Fort William, Ont.

The Board of Works authorized the city engineer to pave the roadway in front of the C.P.R. station. Estimated cost, $7,000, will be borne by the company.

Hull, Que.

The addition to the Hull pump house is nearly completed and the set of pumps, with the capacity of 7 million gallons a day, will be installed this fall. They are being furnished by William Hamilton Co., of Peterboro.

Ladysmith, B.C.

The awarding of contract for cement sidewalk was laid over for another week. The Worswick Paving Company, the Pacific Coast Construction Company and Parfitt Bros., of Victoria, have tendered.

New Westminster, B.C.

The by-law authorizing the raising of $70,000 for building sidewalks throughout the municipality of Burnaby was carried. Work will commence at once and separate tenders called for the construction.

New Glasgow, N.S.

Contract will probably not be let until spring for the proposed waterworks. J. Roy, town clerk.

North Vancouver, B.C.

Tenders addressed to G. S. Hanes, city engineer, will be received until October 31st for supplying and delivering a 15-ton road roller.

Tenders were called until October 24th for supplying 1,400 lin. feet of 18 inch vitrified clay sewer pipe, 1,350 lin. feet of 15 inch vitrified clay sewer pipe, 14 junctions of 18 inch and 16 junctions of 15 inch. G. S. Hanes, city engineer.

Ottawa, Ont.

The first summer under the good roads system, the County of Carleton has graded and gravelled about 25 miles and macadamized about 4 miles. R. W. Farley is engineer. The work this summer will cost about $20,000.

Petrolia, Ont.

Bids will be received until Nov. 1 by J. McHattie, town clerk, for constructing about 6,500 square yards vitrified brick pavement with cement curb and gutter. C. A. Jones, town engineer, Petrolia.

St. Catharines, Ont.

Tenders were called until October 24th for construction of bitulithic pavements here. J. A. Pay, city clerk.

A by-law will be voted on in January by the ratepayers to issue $75,000 waterworks debentures.

Toronto, Ont.

Tenders for asphalt and bitulithic pavements, concrete curb, and walks and sewers on various streets are called until Nov. 1st. R. G. Geary, chairman Board of Control.

Vancouver, B.C.

See "Business Buildings."

Victoria, B.C.

The plan of the Douglas street widening from Humboldt street through to Beacon Hill Park has been approved of by the Streets Committee. Noted in last issue.

Extensive additions to the city's sewerage system were recommended by the city engineer in his report. The extensions are estimated to cost in the neighborhood of $235,000, the chief portion of the work being the extensions in that part of the city north of Edmonton road and east of Cedar Hill, where no sewer system is at present installed. $88,000 will be required to build sewers in this locality within the city limits, and $12,000 for an outlet in Oak Bay municipality, and for the construction of a septic tank near the sea. There will also be required extensions to the old system, principally in the Cook street and Fairfield section, amounting to $41,300, and in the section in the vicinity of Hillside and Blackwood streets, amounting to $47,600. There will also be required additional extensions in Hollywood Park, amounting to $11,500. In the vicinity of Douglas street and Burnside road sewers will be required and a septic tank needed, the cost amounting to $[illegible]1,600. There should be $9,400 spent in Victoria West and $3,800 in James Bay, in all $235,000. This scheme is exclusive of the $46,400 to be immediately used for sewerage extensions which have been authorized.

Tenders for paving Vancouver street between Pandora avenue and Burdette avenue were as follows: Worswick Paving Company, on standard specifications prepared by the city engineer, $2.25 per sq. yard for pavement and 65 cents per yard for removing material, a total of $42,820. Alternative bids for a pavement according to the company's own specifications were submitted of $1.70 and $1.40 per square yard, the total figures being $33,630 and $28,590 respectively. The city engineer's tender was on his standard specification at a cost of $1.90 per yard and 80 cents for removing material, a total cost of $38,160. Westrumite, Limited, bid on the standard specification at $2.25 per square yard and 60 to 70 cents for removing material, a total cost of $42,680, and submitted also an alternative bid of $1.68 per yard for pavement and 60 to 70 cents for removing material, a total of $32,604; and a second alternative bid of $1.46 per yard, a total of $18,064. The tenders were referred to the city engineer.

AWARDED.

Blairmore, B.C.

The Dominion Wood Pipe Company, Limited, New Westminster, are supplying the wire wound wood pipe required for the installation of waterworks here.

Montreal, Que.

The contract for installation of filtration plant for the Montreal Water & Power Company is in the hands of Messrs. Laurin & Leitch, Montreal.

Ottawa, Ont.

The Ottawa Construction Company were awarded contract for asphalt pavements on Wellington street, Flora street and Melgund avenue, at $15,586, $20,560 and $4,395 respectively. The Barber Asphalt Company got the contract for Anne street, $1,900. N. H. H. Lett, secretary, Board of Control.

Oshawa, Ont.

Tenders for extension of outfall sewer were received as follows: W. T. Gibson, Port Hope, Ont, $5,300 (accepted); T. Reid, Brantford, $6,100; McKnight Construction Company, Toronto, $6,216; J. W. Ritton, Kingston, Ont., $6,350; J. Hartnett, Toronto, $5,737. Frank Chappell, engineer in charge.

St. Andrews, N.B.

The contract for the excavation and laying of the water pipes from Chamcook lake to this place has been awarded to Joseph McVey & Son, St. Stephen.

Walkerville, Ont.

Tenders were opened for the construction of a lateral sewer between Argyle and Devonshire roads, and the contract given to Mr. Thomas Chick, Windsor.

Railroads, Bridges and Wharves

Annapolis Royal, N.S.

Tenders are being called until November 8th for [illegible] here by the Public Works Department. R. C. Desrochers, secretary.

Belleville, Ont.

The council will [illegible] to the Board of Railway Commis[illegible] sioners regarding the number of piers for the proposed new bridge to be built over the river by the C.N.R.

County of Ontario, Ont.

On November 29th a by-law will be voted on to raise [illegible] 4 per cent. 20 year bridge debentures.

Cobourg, Ont.

Instead of the proposed union subway of the C.N.R. and G.T.R., the former railway company has decided to build its own subway, and its request has been acceded to by the Railway Commission. The subways will be where the railways cross [illegible] street, and about 600 feet apart.

Fredericton, N.B.

It is expected that the report of the survey and estimates of cost of construction for the St. John River Valley Survey will be presented to the Provincial Government by the end of the year.

Hull, Que.

Joseph Cousineau, of Gatineau Point, according to a 3-year old agreement with the City Council, will spend the sum of $5,000 on repairs to the Gatineau bridge.

Moose Jaw, Sask.

The finance committee brought in a recommendation that, pursuant to the order of the Railway Commissioners, the city engineer prepare necessary plans and specifications for a subway under the C.P.R. tracks, to provide for not more than five tracks side by side as closely as they can be constructed safely, at the point known as the Eleventh avenue crossing.

North Sydney, N.S.

It is stated that tenders for construction of wharf at the ballast heap will be called soon. Estimated expenditure, $50,000. Plans will be prepared for breakwater at Point Aconi. Estimated expenditure, $20,000. Mr. Bernsconi, C.E., is engineer in charge.

Quebec, Que.

The plans for the bridge which is to join Quebec to Limoilou over the River St. Charles have been completed and submitted to Hon. L. A. Taschereau, Minister of Public Works. The proposed trusses of the bridge will be 240 feet long and 52 feet wide, and will consist of two car tracks, two foot passenger tracks and two carriage-ways. L. A. [illegible]alle, Provincial Public Works Engineer.

Toronto, Ont.

The C.P.R. and city have agreed on the following: a 30-foot subway at Scarlet road; a 26-foot subway at Jane street; a 56-foot subway at Elizabeth street.

The Board of Control decided on an appropriation of an additional $15,000 to put in a new span over the Don at the Queen street high level bridge, the old one, according to the City Engineer, not being in sufficiently good condition to warrant placing it in the new structure.

Vancouver, B.C.

The Minister of Railways has approved, with certain restrictions, the plans of the Burrard Inlet Tunnel & Bridge Company for the bridging of the Narrows.

Wallachin, B.C.

Tenders are called until Nov. 28th by Public Works Department, Victoria, for erection of superstructure of 2 span steel bridge over the Thompson river near Wallachin (formerly Penny's) a station on the line of the C.P.R., 218 miles east of Vancouver; also for erection of substructure for same bridge. Tenders are also called for the manufacture of superstructure for bridge, delivered and unloaded. Drawings, etc., at office of E. McBridge, road superintendent, C.P.R., 39 Fairfield building, Granville street, Vancouver, and at office of the Public Works Engineer, F. C. Gamble, Victoria.

AWARDED.

Montmagny, Que.

Contract for wharf extension has been awarded to E. Boulanger, Montmagny, $5,250.

Shelburne, N.S.

Contract for wharf here was awarded to F. A. Ronnan & Company and D. Stewart, of Halifax, $24,790.

Wiarton, Ont.

Contract for breakwater extension in Colpoy's Bay was awarded to Kastner & Porter, Wiarton, $13,990.

Public Buildings, Churches, Schools, etc.

Belleville, Ont.

A by-law was introduced at Council to provide for $30,000 for erection of public school and site.

Dunnville, Ont.

Tenders addressed to J. W. Holmes, town clerk, will be received until November 1st for $30,000 school debentures.

Dresden, Ont.

Tenders are being called until November 9th for construction of post office building here by the Public Works Department, Ottawa. R. C. Desrochers, secretary.

Edson, Alta.

Tenders addressed to J. Bruce Walker, Commissioner of Immigration, Winnipeg, Man., will be received until Oct. 31st for immediate erection of Dominion Emigration Halls. Tenders are also called for erection of same at Entwistle, Alta. Tenders may be for both halls, or for each hall separately. Plans, etc., at office of Mr. Manson, clerk of Dominion Public Works Department.

Fort William, Ont.

At the annual meeting of the hospital board it was decided to spend within the next twelve months about $25,000. A new nurses' home, a larger kitchen, refrigerating plant, etc., are some of the needed improvements.

High River, Alta.

Tenders are being called until November 2nd for construction of armory here by the Public Works Department, Ottawa. Plans, etc., at office of W. Womerton, High River, and at office of J. J. O'Gara, architect, Calgary.

Hull, Que.

An option has been taken on 80 acres of land on the Aylmer road by a syndicate, chiefly of American capitalists, on which it is proposed to erect large stables, grand stand and construct a race course.

Lethbridge, Alta.

Tenders addressed to John Stocks, Deputy Minister of Public Works, will be received until Nov. 5th for supplying and erecting of electric lighting fixtures for the court house here. Specifications at engineer's office, public works, etc.

Montreal, Que.

The Hebrew community are anxious to obtain possession of the Labor Temple. If the deal goes through it is understood that the present building will be pulled down and a synagogue erected.

The Jesuit Order has purchased a large block of land back of the mountain as a site for the new college building. Work has been started on clearing off the land preparatory to the commencement of building operations.

At the annual meeting of the Montreal Foundling and Baby Hospital, the question of erecting a new building to cost $100,000, was discussed, and it was decided to appeal to the public for the funds. Miss D. M. Robertson, secretary.

Newmarket, Ont.

Tenders addressed to J. E. Hughes, town clerk, will be received until November 3rd for sale of $15,000 debentures for high school purposes.

North Battleford, Sask.

The Council have agreed to meet the wishes of the Sisters of the Order of Providence, Montreal, in regard to the proposed hospital here. Estimated expenditure, $50,000.

The provincial government has decided to locate the provincial asylum here on the banks of the Saskatchewan river.

New Westminster, B.C.

A local syndicate will, it is stated, erect a theatre of brick and concrete. Estimated cost, $150,000. Work to be finished by August, 1911.

Ottawa, Ont.

Tenders for the electric fixtures for the city hall are being received by C. P. Meredith, architect.

The Woman's Auxiliary of St. Luke's hospital will have a conference with the hospital board in regard to the building of an up-to-date laundry in connection with the institution.

An addition to the children's ward of Water street hospital is contemplated.

Permit has been issued to Dominion Government for addition to East Block, $222,800; Doran & Devlin, contractors.

Ponoka, Alta.

Tenders addressed to John Stocks, Deputy Minister of Public Works, will be received until Nov. 5th for supplying and erecting of electric light fixtures for asylum here. Specifications at Department of Public Works, Edmonton, at the branch office of the Department, Calgary, and at the inspector's office, Lethbridge.

Regina, Sask.

The Dominion Government received a permit for brick dwelling at the barracks, $15,000.

St. John's, Que.

It is proposed to erect a curling ring beside the skating rink. Major Parke, or G. P. Smith are interested.

South Vancouver, B.C.

W. T. Broderick, a Cedar Cottage real estate agent, is calling for tenders for the erection of the Orange Hall near the station.

Toronto, Ont.

Tenders are being called for trades required in the erection of fire hall on St. Clair avenue until Nov. 1st. Advertisement in "Tenders and For Sale Department" of this issue.

The city architect has granted the permit for the erection of the medical wing of the proposed new General Hospital. It will be erected on College street, and will be three storeys in height, with basement. The cost will be $250,000.

Vancouver, B.C.
Plans for the campaign for raising $500,000 for the purpose of building new quarters for the Y.M.C.A. were considered favorably at a meeting of the directors recently. E. W. Keenleyside, president; Mr. J. M. Graham, secretary, and Mr. C. R. Sayers, field secretary for Western Canada.

Winnipeg, Man.
The city solicitor has been instructed to frame a by-law to provide ultimately over $2,000,000 for a new city hall on the site of the present one. Alderman Douglas is interested.

AWARDED.

Arthabaska, Que.
The contract for public building here was awarded to Paquet & Godbout, St. Hyacinthe, Que., $22,000.

Battleford, Sask.
The contract for post office here was awarded to M. A. Pigott & Son, Hamilton, Ont.

Brampton, Ont.
The contract for temporary market building, 18 x 60 feet, has been let to W. B. McCulloch.

Brandon, Man.
The contract for brick work on city stables was given to J. Chambers. Work will be done by city, city supplying material. A Struthers is in charge. W. A. Elliott, architect.

Fredericton, N.B.
Contracts for the new school building on the Weldon lot were awarded as follows: P. Mooney & Sons, masonry, $22,195; R. J. Green, carpenter work, $13,500; J. E. Wilson & Company, steel and fire escapes, galvanized iron and steel ceilings, $5,115; J. H. Pullen, painting, $1,440; R. E. Fitzgerald, plumbing, $3,715; J. H. Doody, heating and electric wiring.

Fort William, Ont.
M. H. Braden, this city, has been awarded the contract for erection of police station and court house here, $50,251. The contract for the heating plant and plumbing was awarded to the Fort William Hardware Company, $5,064.

Halifax, N.S.
The Halifax Canadian Club has accepted the tender of Mr. S. M. Brookfield to build a memorial tower at a cost of $23,960. The tower is to be completed July, [illegible]

Kaslo, B.C.
The contract for the erection of the new court house has been awarded to John Burns & Son, Nelson. It is understood the building will be completed and ready for occupancy not later than next autumn. The contract price is given at [illegible]

Marieville, Que.
The contract for the public building here was awarded to Lachance Bros., of Ottawa, [illegible]

Moose Jaw, Sask.
The contract for erection of curling rink here has been let to Thos. Grayson, this city, for $10,185. Storey & VanEgmond, architects, Regina.

Montreal, Que.
The general contract for erection of church on St. Zotique street has been awarded to Messrs. Bonnell Bros. contractors, Guy street. J. R. Gardiner, Quebec Bank Building, architect.

Niagara Falls South, Ont.
T. E. Ferris was awarded the contract for building the new south end fire hall, $5,000. Work to be completed by February 1st, 1911.

Ottawa, Ont.
R. W. & C. Lester have been awarded the contract for the excavation and foundation of new Bethany Presbyterian church. J. A. Ewart, architect.

Smith Brothers have been awarded the contract for erecting the model dairy at the Exhibition grounds, an addition to the fat stock building. It will be concrete up to the windows and iron-clad for the remainder. Cost $6,000. Plans have been approved by Provincial Government.

Smith's Falls, Ont.
The contract for erection of new collegiate institute here was awarded to John Davidson, $38,100.

Victoria, B.C.
Contracts have been let by the provincial government for the construction of the Central School at Fort Langley, at a cost of $3,000; to Mr. John L. Bruge, for the construction of a school on Graham Island, at a cost of $2,325; and to Mr. W. G. Simpson, for a school at Okanagan Landing, at $1,750.

Waterloo, Ont.
The contract for public building here was awarded to L. B. Lachance, of Ottawa, at $36,975.

Residences

Calgary, Alta.
Building permits were issued recently to S. H. Haslam, two $4,000 frame houses on Fourteenth avenue, between Sixth and Seventh streets, also frame house, $2,000, on Sixteenth avenue, between Tenth and Eleventh streets; Lee Goulding & Company, $2,500, frame house on Mission property; G. A. Allan, $2,000, house on Thirteenth and Fifteenth street west.

Ottawa, Ont.
The building permits include: R. P. Moodie, dwelling, Fentiman avenue, $2,500, McArthur Brothers, builders; M. Korn, dwelling, Bell street, $2,200; Daniel O'Byrne, dwelling, Gladstone avenue, $2,500; Victor Realty Company, dwellings, Monk street, $8,000, G. Tomlinson, builder; J. B. Cannon, dwelling, Irving street, $4,500, N. Hollister, builder; W. F. Fraser, dwelling, Arlington avenue, $4,000; Augusta Boehmer, dwelling, Shanley avenue, $2,500.

St. Boniface, Man.
The following permits for dwellings were taken out: J. A. Senecal, Mason street, $5,300; alterations to house on Mason street, $2,500.

Toronto, Ont.
The Provident Investment Company have sold to W. O. McTaggart 600 feet of vacant land on Primrose avenue. Houses will be built on the property.

Victoria, B.C.
Building permits were issued to [illegible] Bell for three dwellings on [illegible] street to cost $6,250; to William Dunford & Sons, dwelling on Chamberlain street to cost $2,400; to G. H. Barnard for a dwelling to be erected on [illegible] avenue, [illegible], and to Mrs. I. Staples for a dwelling on Lansdowne avenue to cost $2,200.

AWARDED.

Calgary, Alta.
W. M. Johnston has been awarded the contract for the erection of 3-storey residence for Lt.-Col. Walker. Estimated cost $10,500. Size, ground floor, 38 x 40; Lang & Dowler, architects.

Victoria, B.C.
Mrs. K. C. Wilson has awarded contract to D. H. Bale for residence on Admiral Rd.

Business Buildings and Industrial Plants

Burton, N.B.
The McLellan-Smith Lumber Company, it is stated, will rebuild their mill which was destroyed by fire on the 16th inst. Estimated loss, about $7,000.

Berlin, Ont.
The Wunder Furniture Company are erecting a large addition to their furniture factory.

Buckingham, Que.
A stable and carriage house for Alex. Maclaren will be built at Buckingham. J. P. Maclaren, architect, of Ottawa, is preparing plans.

Carlyle, Sask.
Marlatt & Clarke Company, Fort Atkinson, Wis., are negotiating for the establishment of a creamery here. One is already under way in North Portal. H. [illegible], representative.

Calgary, Alta.
We are informed that the business block mentioned in October 12th issue will be five storeys, of solid brick with concrete basement. Estimated cost, $120,000. Architect, D. S. McIlroy, this city; owner, Thos. Underwood, Box 91, Calgary.

Tenders were called until October 22nd for excavation and concrete work required in the erection of business block for Wendell Maclean. Messrs. Lang & Dowler, Room 17, Alexander Corner, architects.

Duncan, B.C.
A committee composed of G. H. Hadwen, W. H. Elkington and others were appointed to prepare a report on proposed fruit canning and packing plant. W. Hanham, of the Bank of B. N. A., secretary-treasurer.

Emard, Que.
It is expected that contractor C. E. Deakin will start this fall building the plant for the Canadian Tube Company on St. Patrick street. Site purchased covers 5½ acres.

A conjecture is abroad that the recent purchase of 65 acres attributed to the C.P.R. is for factory sites. H. Hadley, ex-mayor of Verdun is interested.

Elmwood, Man.
The Stewart Sheaf Loading Company will [illegible] Western Iron Works, on Union avenue, for the manufacture of sheaf loaders. The plant will be in operation in time to sup[illegible]

Edmonton, Alta.
[illegible] plication made by H. E. Davis, of Pittsburg, for a permit to erect an 8-storey building on Jasper avenue, at a cost of $1,500,000, was fraudulent. The applicant has disappeared.

Fort William, Ont.
[illegible] corporated for the purpose of erecting a

[illegible] [illegible] and cold storage plant. The [illegible] [illegible] interested in the company are [illegible] Armour and Robert Armour, of this city, and Mr. Paisley, of Scotland. Capitalization, [illegible].

Franklin, Man.
[illegible] Campbell's elevator was destroyed by fire on the 14th inst.

Goderich, Ont.
It is stated that a representative of Chicago and Duluth interests has been looking over the ground with a view to the erection of a [illegible],000,000 bushel elevator.

Harriston, Ont.
On October 24th the town passed a by-law granting free site and factory building to the Canada New Shoe Company, Limited.

Hamilton, Ont.
We are informed that the Acme Motor, Carriage & Machinery Company, Limited, mentioned in issue of October 19th, will start operations at once on their new building. The intention is to erect three buildings, 600 x 60, one storey, corrugated iron roofing and siding, but only one will be erected this year. The plans are in the hands of a Detroit automobile factory. F. J. Woods, Waldorf Hotel, representative of the American Road Machine Company, is local manager.

The Canada Steel Company has taken out a permit for a frame and corrugated iron mill building, 210 x 70 feet, and one storey high. It will be located on Sherman avenue north, and will cost $10,000. The entire plant, when finished, will cost about $400,000.

Halifax, N.S.
H. E. Macarthur's woodworking factory was destroyed by fire on the 20th inst. Loss about $5,000.

The Traders Bank are said to be interested in the purchase of a building site on Granville street.

Maisonneuve, Que.
The branch of the Bank of Toronto to be erected here will cost, it is stated, about $25,000; the Tetrault Boot & Shoe Company will erect a new factory building.

Medicine Hat, Alta.
The by-law granting site to the Alberta Iron Roller Mills Company was carried. Work is expected to commence on the 24th inst.

Montreal, Que.
A building permit was issued to St. Lawrence Flour Mills Company, Limited, Notre Dame street, for 6-storey mill building, $50,000.

Montreal, Que.
Marler's garage, 431 Guy street, was destroyed by fire on the 18th inst. Total estimated loss, $50,000.

New Westminster, B.C.
The Cloverdale hotel and Bernard & McIllroy's livery barn were destroyed by fire recently. Total loss, $8,500.

Port Arthur, Ont.
The Port Arthur Wagon Company have deposited their guarantee in connection with the proposed large factory to be erected here.

Ottawa, Ont.
Tenders were called until October 24th for the stone, brickwork and fireproofing for new baking premises on Catherine St. for the Slinn-Shouldis, Limited. James Mather, architect, 110 Wellington street.

Permit was issued for C.P.R. warehouse, Botelier street, $3,500. E. G. Laville, builder.

S. Kronick will convert a double tenement on St. Patrick street into stores, and L. Rosin has purchased another tenement on the same street to be converted into a commercial property.

Work on the new Blackburn building has been discontinued as the result of an interim injunction issued against the owners, which prevents them using a certain yard which forms part of the site of the new building.

Penetang, Ont.
Tenders were called until October 25th for the trades required in erection of foundry building here. Forster & Clark, architects, Owen Sound.

Quebec, Que.
It is understood that a company, not yet incorporated, will take over the Price limits and lumber mills here and that a large paper making plant to handle the raw material will be erected. Notice was given in last issue of the increased capitalization of Price Bros., Limited. W. M. Aitken, of Montreal, is interested. Location of mill probably at Lac au Sable.

Tenders will be received by R. P. LeMay, architect, up to November 4th, for the construction of an office building for the Quebec Railway, Light, Heat & Power Company.

For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Mr. Wm. Wainwright, 2nd vice-president G.T.P., is authority for the statement that a large hotel will be built here.

Price Bros., Limited, are reported to be planning the erection of a large paper mill at Lac au Sable, Saguenay county.

Regina Sask.
Permits were issued to E. J. Blaquer for brick warehouse on Rose street, $17,000; to P. McAra, Jr., brick garage on Albert street, $10,000.

It is again stated that the Hart-Parr Company, a United States firm, will locate a branch here, a site being selected in block 186. W. H. Williams, representative.

The plans have been approved and permit secured for the plant to be erected by the Canadian Overland Company, Limited. Messrs. McAra Bros. and Wallace are in charge of the erection.

Stellarton, N.S.
H. S. McArthur's factory was destroyed by fire recently. Estimated loss, $10,000.

Sault Ste. Marie, Ont.
It is understood that the Hearst interests are interested in the proposed establishment of a pulp mill by a syndicate of American newspaper proprietors, including capitalists in Chicago and San Francisco.

St. Boniface, Man.
The Rice Malting Company of Canada has taken out a building permit for their plant in St. Boniface, amounting to $252,500. The size of the building is 280 by 86 feet, the portion containing the elevators being 60 by 40 feet and 138 feet in height, while the engine room is 40 by 28. It is expected that the plant will be ready for operation in about three weeks' time.

The Winnipeg Ceiling & Roofing Company, on lot 31, was given a permit for a plant 160 feet long and 110 and 80 wide, costing $59,000, which will be completed and ready by January.

Tilbury, Ont.
The vote on the auto top by-law was carried.

Toronto, Ont.
The north-west corner of Peter and Richmond streets has been purchased by George Weston for $15,000. A biscuit factory will be erected on this site in the near future.

The Dayton Scale Company have purchased through the Provident Investment Company 200 feet of vacant land on Campbell avenue, near Royce street, wherein a branch of the Dayton, Ohio, works will be erected.

The C.P.R. has purchased more property beside the present office, corner King and Yonge streets. Eventually a large central office building will be erected. Work on the tearing down of the Rogers building purchased previously has begun. This will give room for the extension of the ticket offices.

Victoria, B.C.
It is understood that plans will be drawn up within a short time for the erection of the five or six storey building for the Union Bank of Canada on Government St. G. H. Balfour, general manager. Noted in issue of Sept. 21.

Vancouver, B.C.
The Westrumite Limited, of Brantford, Ont., are preparing to erect a plant in Victoria or in this city. L. S. Van Westrum, president.

Tenders are asked for excavation for the new 12 storey Standard Building at the south-west corner of Homer and Pender streets to be erected by the Consolidated Buildings, Limited. Bids are also being called for the steel work. Architects, Donellan & Donellan, 219 Pender street.

A new four storey annex to the Hotel Vancouver, with a frontage of 125 feet on Robson street and a similar frontage on Howe street, and a depth of 40 feet, will be built immediately. Brick will be the material used, and the architecture will conform as nearly as possible to the new wing of the present main structure. Tenders for excavation work and the foundations were called on the 11th inst.

Among the building permits issued this week was one to Mr. E. E. Hewson covering a three storey brick block on Richards street just south of Georgia street. The building will be three storeys in height and is planned for stores and apartments, the expectation being the new tramline on the street will lead to its being developed as a retail business centre. The estimated cost of the building is $36,000.

Important announcements of proposed terminal improvements to be made here by the Canadian Pacific Railway were announced by Mr. William Whyte, of Winnipeg, second vice-president. They include better accommodation at the station, better wharfage facilities and double elevator capacity.

Woodstock, N.B.
The Fleming Gibson, Limited, organized recently, will erect on their newly acquired property near McAdam Junction, a new mill to manufacture lumber. They have a contract for supplying 25,000 railroad ties. Capitalization, $24,000. J. Gibson, Benton, president; M. L. Hayward, Hartland, secretary-treasurer; Hon. J. K. Fleming, managing director.

Winnipeg, Man.

Mr. D. Van Doresser, secretary-treasurer, Winnipeg Tanning Company, Limited, writes that no changes are contemplated in the Mullins tannery, acquired recently, until next year. Noted in last issue.

E. R. Gabett, consulting engineer of a large British firm engaged in manufacturing creosote, is in the city collecting data for the establishment of a large plant for the manufacture of creosote and allied products.

Negotiations with the city have been completed by the Ontario Wind Engine & Pump Company in regard to their locating here. The proposed plant will be five storeys of brick and stone. Estimated expenditure, $100,000. Foundation will probably be put in this fall. J. M. Reid, representative.

Ymir, B.C.

The Active Gold Mining Company are making preparations to install a sawmill at Porcupine Creek. P. V. Loth, secretary-treasurer.

AWARDED.

Calgary, Alta.

J. H. Gunn & Company, this city, has been given the contract for basement only of the business block to be erected for Thos. Underwood. D. S. McIlroy, architect.

Cobourg, Ont.

The C. N. O. Railway has let the contract for its station here to Martin, Jex & Company, contractors, Cobourg, who also have the contract for the mason work in the Port Hope station.

Montreal Que.

Contract for electric wiring of the new store building for Messrs. A. E. Rea & Company, Limited, have been awarded to the Sayer Electric Company, 14 Beaver Hill. General contractors, Byers & Anglin, 18 St. Alexis street. Architect, A. F. Dunlop, Lindsay building.

General contract for erection of store on St. Catherine street west for Mr. A. Larue has been awarded to R. Brouillet, contractor, 79 St. Elizabeth street. Architect, A. St. Louis, 80 St. Gabriel street.

Winnipeg, Man.

A. B. Ormsby, Limited, Toronto, received the contract for the sheet metal, copper and roofing work for the new Bank of Montreal now being erected at the corner of Portage avenue and Main street.

Power Plants, Electricity and Telephones

Brandon, Man.

City Engineer Speakman has completed his investigation of the hydro-electric power scheme submitted to the city by the Western Power & Light Company.

Belleville, Ont.

It is stated that Electro Power Company has taken over charter held by local men and that on January 1st the company will apply for the necessary concessions to enable them to build and operate here.

Coquitlam, B.C.

The Western Canada Power Company's by-law was carried. William McNeill, manager.

Duncan, B.C.

The electric light by-law was passed on the 8th inst. The electrical engineer who has been installing the electric plant in Stewart has been sent for and will begin operation. The Eaton property has been secured and a brick building will be put up. At present the electricity will be generated by steam.

Edmonton, Alta.

In view of the action of Mr. A. Violette in seeking to estabilsh prior rights in development of power on the Athabasca river which the city of Edmonton proposed to develop, Commissioner Bouillon, acting under instructions from the city council, it is stated, has taken up the matter with the Minister of the Interior, to ascertain the position of the city's claim, and to safeguard its interests.

Fort Frances, Ont.

The construction of the Rainy River Radial Railway is being discussed. Engineer, G. A. Knowlton.

Lethbridge, Alta.

See "Public Buildings."

Nanton, Alta.

Tenders will be received until Nov. 15 for $7,500 5 per cent., 20 year, electric light and fire protection debentures. W. Robertson- secretary-treasurer.

Ottawa, Ont.

See "Public Buildings."

Ponoka, Alta.

See "Public Buildings."

Phoenix, B.C.

The B. C. Copper Company has commenced construction on their aerial tramway from Lone Star mine in Washington State to Boundary Falls, B.C. (five miles). Estimated cost, $75,000.

Port Hope, Ont.

Col. Ward, K.C., announces that the Ontario Government Cabinet has passed an order in council granting lease of land for power sites at Burleigh Falls to the Central Ontario Power Company, the owners, and also lessees of the Dominion Government of power and also use of canal dam and works.

Regina, Sask.

The money by-law to raise $100,000 for street railway purposes was carried.

A serious proposition is confronted by this city in the form of an inadequate plant for supplying the amount of electrical energy to supply the light and power necessary and this in spite of the installation of a new unit last spring. The present equipment is badly overloaded, resulting in no less than three breakdowns in one day.

Renfrew, Ont.

The power house of the Renfrew Electric Company here, owned by the town, was destroyed by fire on the 21st inst. Manager, A. A. Wright.

Debentures to the amount of $117,000 are being offered by the town of Renfrew, the proceeds to be used for the construction of a municipal plant and distributing system for electricity in connection with the Hydro-Electric Power Commission plant.

Sherbrooke, Que.

Plans are being prepared by Messrs. Ross & Holgate, of Montreal, Que., for the construction of a new power house on the Magog river. The proposed plant will develop about 3,000 h.p.

Stratford, Ont.

The Light & Heat Commission are considering alterations to the old electric power station. Architect Hepburn has prepared plans and tenders will be called.

St. John, N.B.

James Kent. general manager of the C.P.R. Telegraph Company, foreshadows an extension of the company's lines along the Dominion Atlantic Railway.

Vancouver, B.C.

The plans of the local syndicate which has recently applied for a charter to build a scenic mountain railway provide for one similar to that up Mt. Tamalpais in California. Those behind the application are said to be Messrs. Macdonell & Gzowski, engineers and railway contractors; Chas. H. Allen, barrister, formerly of Winnipeg, but now of this city; Mr. Geo. M. Gibbs, former manager of the Dawson branch of the Canadian Bank of Commerce and now a local broker; and Mr. Walter. E. Graveley, of the firm of Hope, Graveley & Company, of this city. A tourist hotel and cottages would probably follow.

Winnipeg, Man.

M. Peterson, secretary Board of Control, writes that the purchase of the motor car for tramway has been deferred for the present.

Tenders addressed to Chairman, Board of Control, will be received until Nov. 2nd for supply of 25,000 carbons for series alternating enclosed arc lamps, one half to be corded, the other half solid. Specifications at office of the city engineer.

Yorkton, Sask.

A deputation of citizens will visit several American cities in order to get data regarding steam or gas producer plants. The town will install one or the other shortly.

AWARDED.

Maissonneuve, Que.

The contract for lighting the streets for ten years was awarded to the Dominion Light, Heat & Power Company. Arc lamps of 2,000 c.p. at a rate of $80 each will be furnished.

Ottawa, Ont.

The Ottawa Electric Railway Company has given the contract for building 18 new "pay-as-you-enter" cars to the Ottawa Car Company.

Toronto, Ont.

The McGuigan Company has the contract for erecting ten sets of concrete piers to support the steel towers for carrying the Hydro-Electric cables from a point opposite the High Park gate to within a short distance of the Exhibition grounds.

Winnipeg, Man.

The contract for the supply [illegible] No. 6 waterproof copper wire, 3,000 pounds No. 8 waterproof copper wire and five miles galvanized iron wire with waterproof insulation has been awarded to E. F. Phillips Electrical Works, Winnipeg.

Miscellaneous

Hamilton, Ont.

The following building permits have been issued: Mills & Hutton, brick dwelling, corner Westmoreland and Delaware avenues, for H. S. Lees; E. B. Patterson, brick dwelling on Argue street, for J. J. Hobson, [illegible]; William McFarlane, [illegible] dwelling on [illegible] avenue, [illegible]; Weeks & Morrell, brick dwelling on Sanford avenue, between Main and Delaware avenue, $2,200; Stewart & Witton, factory for the [illegible]

(Continued on page 31)

Tenders and For Sale Department

Debentures for Sale

[illegible] addressed to the undersigned, [illegible] Tenders for Debentures,'' will be re[illegible] o'clock p.m. NOVEMBER the [illegible] School Debentures for the Town of Dunnville, Ont., interest at the rate of four and one-half per cent. per annum, pay[illegible] Bank of Commerce, Dunnville, in annual instalments of both principal and interest. No tender necessarily accepted.

J. W. HOLMES,
Town Clerk.

[illegible] Oct 13, 1910 43

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked ''Tender for Street Railway Material,'' until the SEVENTH DAY OF NOVEMBER, at 12 o'clock noon, for supplying to the City of Calgary Rails, Cars, Equipment and Overhead Material for extensions to Municipal Street Railway.

Full particulars and specifications may be had on application to the Commissioners, City of Calgary; marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

Specifications are also on file at the office of the Contract Record, 504 Confederation Life Building, Toronto.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

The City of Calgary

Sealed tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked ''Tender for Erection of Bridges,'' until the SEVENTH DAY OF NOVEMBER NEXT, at 12 o'clock noon, for the erection of steel bridges, one across the Elbow River at Twelfth Ave., and the other across the Elbow River at Second Street East.

Full particulars and specifications may be obtained from the Commissioners, City of Calgary, on application.

A marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

W. D. SPENCE,
City Clerk.

Dated at Calgary, Sept. 28th, 1910. 43

Debentures for Sale

Offers will be received by the undersigned up [illegible] DAY OF NOVEMBER NEXT, for the purchase of the following debentures, viz.:

(1) $4,250 payable in 30 equal annual instalments with interest at 5 per cent.

(2) $12,900 payable in 30 equal annual instalments with interest at 5 per cent.

(3) $13,250 (Local Improvements) payable in 30 equal annual instalments with interest at 5 per cent.

H. HARTMAN,
Clerk.

New Liskeard, Ont., Oct. 12, 1910. 43

Tenders

Quebec Railway, Light, Heat and Power Company

SEALED TENDERS are requested from responsible contractors for the construction of an

Office Building

in the city of Quebec, for the Quebec Railway, Light, Heat and Power Company.

Also for the heating and ventilation of same.

For the plumbing system.

The electric wiring, lamps and lighting fixtures.

The passengers and freight elevators.

Plans and specifications for any and all of the above can be seen at the office of the undersigned architect, or may be secured for the purpose of estimating, upon the deposit of a sum of $25.50 as security for the return of the same.

All contractors tendering upon the above works must accompany tender with an accepted cheque, made payable to Mr. C. E. A. Carr, general manager of the Company, equal to fifteen per cent. (15 p.c.) of the amount of tender, which will be forfeited if any person tendering declines to enter into a contract as, and when called upon to do so, or fails to complete the work contracted for. If the tender be not accepted, the cheque will be returned.

Tenders to be written on a special form, prepared by the architect, must be enclosed in sealed envelopes, plainly marked on the outside and addressed to Rene P. LeMay, Architect, 21, d'Aiguillon Street, Quebec.

Tenders will be received until four o'clock p.m., FRIDAY, THE 4TH OF NOVEMBER, 1910.

The Quebec Railway, Light, Heat and Power Company reserves the right to reject any and all tenders.

By order,

RENE P. LeMAY, Architect,
21 d'Aiguillon St., Quebec.

11

Tenders

for Storage Shed for the Fire Department to be erected at the rear of Cowan Avenue Fire Hall

Bulk tenders, or tenders for the several trades mentioned below, in connection with the above building, will be received by registered post only, addressed to the undersigned, up to noon on TUESDAY, 1ST NOVEMBER, 1910:

1. MASON WORK, ETC.,
2. CARPENTER, ETC., WORK.
3. ROOFING.

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents. The usual conditions relating to tendering, as prescribed by city by-law, must be strictly complied with, or tenders may not be entertained.

Tenderers shall submit with their tender the names of two personal sureties, or the bond of a Guarantee Company.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor.
Chairman Board of Control.

City Hall, Toronto, October, 1910. 43

To

Building Contractors

Valuable Manufacturing Plant for Sale in Town of Hespeler

Pursuant to the winding-up order made in the matter of The Parkin Elevator Company, Limited, and with the approbation of the Local Master of the High Court of Justice at Berlin, sealed tenders addressed to The London and Western Trusts Company, Limited, London, Ontario, and marked ''Tender for Parkin Plant'' will be received up till 4 p.m. OF THE 5TH DAY OF NOVEMBER, A.D. 1910, for the purchase of the real estate, buildings, plant, machinery, stock-in-trade and assets belonging to The Parkin Elevator Company, Limited, and situate in the Town of Hespeler, Ontario, of which the following is an inventory:

(a)	Real Estate and Buildings ...	$14,936.00
(b)	Plant Equipment	6,633.00
(c)	Foundry Equipment	3,165.00
(d)	Machinery	9,580.00
(e)	Patterns	8,183.00
(f)	Patents, Prints and Tracings..	1,200.00
(g)	Office Furniture	695.00
(h)	Office Supplies	850.00
(i)	Tools	875.00
(j)	Stock-in-Trade	17,731.66
		$63,848.66

The real estate and plant will be sold subject to an existing mortgage thereon bearing interest at 4½ per cent. per annum and payable in equal annual instalments.

The buildings are new and modern in every respect and the plant is up-to-date. The Town of Hespeler is admirably situate for manufacturing purposes, having both C.P.R. and G.T.R. connections. Switches adjoin the property. Several very large manufacturing industries are located there, among others, R. Forbes Woollen Mills, Canada Machinery Company, Limited, Jardine Tool Works, Hespeler Furniture Company and W. A. Kribs' large lumber and planing mill plant.

The following is a description of the real estate: Lots numbers five and six on the north side of Sheffield street in the George D. Forbes survey.

The property will be offered subject to a reserved bid and subject to conditions of sale.

Terms: A marked cheque for one thousand dollars payable to the order of the liquidator shall accompany each tender and the balance shall be payable in cash within thirty days from the date of acceptance of tender without interest.

The Local Master will attend at his Chambers, King street, Berlin, on the 11th day of November, A.D. 1910, at four o'clock in the afternoon to consider the tenders.

For further particulars, conditions of sale, form of tender, inspection of inventory or other information apply to The London & Western Trusts Company, Limited, Liquidator, London, Ontario, on the factory premises at Hespeler, or to Melvin A. Secord, Galt, Ontario, Solicitor for the Liquidator.

J. J. A. WEIR,
Local Master at Berlin.

Dated 7th October, 1910.

MELVIN A. SECORD,
Galt, Ont.
Solicitor for the Liquidator.

42

We are in receipt of a neat concise map of railroads operating in Western Canada issued by the Board of Trade of Portage la Prairie, Man. On the back is a sectional map of the city showing the sites still available for manufacturing sites. H. G. Coleman, secretary.

Silica Brick & Lime Co., Limited

By order of the Trustees under Debenture Trust Deed, Messrs. Stewart Williams and Company will sell by Public Auction, on SATURDAY THE 12TH DAY OF NOVEMBER, 1910, at 11 o'clock in the forenoon, at the Driad Hotel, Victoria, B.C.

The undertaking and all the property and assets of the Silica Brick and Lime Company, Limited, as a going concern, and which comprise in particular the Freehold Lands forming the Site of the Company's Brick and Lime works at Atkins Siding, Esquimalt District, B.C., and being part (24 acres or thereabouts) of section 105 and all section 113 (about 142 acres), Esquimalt District, and all Buildings thereon and the brick and lime making Plant, Machinery, Fittings, Stock in Trade, Tools, Implements and other Chattels and effects in, upon and about the said premises.

Further particulars can be had and conditions of sale seen on application being made therefor at the Company's offices, No. 512 Fort Street, Victoria, or at the offices of the auctioneers, No. 637 Fort Street, Victoria, B.C. 44

Miscellaneous

(Continued from page 29)

A. Edwards, brick addition to Gurney-Tilden foundry and office, John street, to cost $15,000; Springer & Company, frame dwelling at 11 Monroe street, and one at 23 Niagara street, for Burke-Daniels Company, to cost $2,600; J. H. Williams, two brick dwellings on Westmoreland avenue, to cost $3,000; J. H. Williams, two brick dwellings on Locke street south, between King and Main, to cost $3,000.

Montreal, Que.

The work of widening and deepening the canal, just below the locks, has been progressing slowly, but it is said that it is being well done. It is said by the officials of the Government that further big improvements will be made to the canal in the vicinity of St. Paul, and that it would take about two years to carry out the improvement schemes.

Recent building permits include: G. Caichioni, 1449 St. Clair street, house containing two dwellings on Evelyn street, $2,000; A. Larue, Longue Pointe, a store building at 32 St. Catherine street east, $4,000; T. Sauve, 1161 Simard street, house containing three dwellings on Marquette street, $2,500; J. A. Rochette, 1128 Rachel street east, house containing four dwellings on Messier street, $3,000; Geo. A. Joannes, 670 Huntley street, two houses containing four dwellings on St. Hubert street, $13,000; Richer & Freres, 1817 Christopher Colomb street, house containing five dwellings on Christopher Colomb street, $6,000, and house containing two dwellings on St. Denis street, $4,500; Jos. Mayrand, 50a Lacasse street, house containing two dwellings on Old Orchard avenue, [illegible]; Jos. Perron, 1141 Huber street, house containing two dwellings Gilford and St. Hubert streets, $3,000; Z. Michaud, 982 Sanguinet street, house containing three dwellings on Sanguinet street, $3,500; J. Paquette, 1931 [illegible] street, two houses containing six dwellings on Dufferin street, $3,500; A. Sauvageau, 500 Laval avenue, house containing three dwellings on Boulevard St. Joseph, $4,500; J. Leveille, 66 Mareil avenue, a 3 storey house on Mareil avenue, $2,000; Synod of Montreal, 1729 Dufferin street, a church building on St. Zotique street, $14,000; L. Langevin, 48 Parc Lafontaine, two houses containing six dwellings on Lagauchetiere street east, $5,000; L. Larue, 2514 St. Lawrence Boulevard, two houses containing six dwellings on Alma street, $3,000; C. Bastien, 19 Laurier avenue, two houses containing five dwellings on Laurier avenue, $7,000; J. E. Vanier, 5 Beaver Hall Square, a two storey stable building on Sanguinet street, $4,000; N. Landry, 655 Beaudry street, house containing three dwellings and store, on Beaudry street, $8,500; C. A. Lemieux, 668 Casgrain street, two houses containing four dwellings on Casgrain street, $3,000; E. Major, 312 Clark street, house containing three dwellings on Waverly street, $4,500; A. Dubreuil, 702 Mount Royal east, two houses containing two dwellings on Evans avenue, $4,000; L. A. Meunier, 285 Letourneux street, two houses containing four dwellings and two stores on Laurier avenue, $11,000; L. W. Chaput & Frere, 965 St. Catherine street east, an apartment house on St. Luke street, $18,000; A. Garaleik, 329 Elm avenue, house containing two dwellings on Elm street, $2,000; Ideal Saving Loans & Land Company, 292 St. Catherine street west, house containing two dwellings on Dandurand street, $2,500; L. Lafleur, Lachute, Que., two houses containinfi six dwellings on Dufferin street, $4,500; A. Croquette, 170 Bourbonniere street, house containing five dwellings on Stadacona street, $3,500; A. Giguere, 427 Charlevoix street, two houses containing six dwellings on Park Lafontaine, $8,000; D. Denis, 685 Cowan street, two houses containing six dwellings on Belgrave street, $4,500, and a two storey house on Belgrave street, $2,500; J. F. Lavoie, Cote des Neiges west, a two storey house on Lacombe avenue, $3,000; P. Cote, La Salle avenue, house containing three dwellings on Garnier street, $2,300; Y. Sauvageau, 209 Aylwin street, house containing five dwellings on Aylwin street, $4,500; J. Fauteaux, 71 Marin street, house containing five dwellings on Albert street, $4,000; U. Marcotte, 629 St. Edward street, house containing five dwellings on Christopher Colomb street, $4,000; L. H. Maher, Guardian Building, alterations to property at 622 St. Catherine street west, cost $5,000.

Temiskaming, Que.

Tenders are called by the Public Works Department, Ottawa, until November 15th for excavation of part of a channel above the completed sluices of the Temiskaming dam on the west side of the Ottawa river. R. C. Desrochers, secretary.

Toronto, Ont.

Recent building permits include: T. Gardiner, pair semi-detached 2½ storey brick dwellings, Beech avenue, $4,600; Symons & Rae, two storey and attic brick dwelling, Bedford, $12,000; Toronto General Hospital, 3 storey brick medical wing, College, $250,000; G. Lawrence, 3 storey brick addition to bakery and garage, corner Carr and Denison, $39,000; Mr. Dalton, pair semi-detached 2 storey brick dwellings, Brock, $4,500; Canada Metal Company, 2 storey brick factory, Fraser avenue, $35,000; Lewis LeGrow, pair semi-detached 2 storey and attic brick dwellings, Manning avenue, $5,000; Jos. Bollons, pair semi-detached 2 storey brick dwellings, Constance, $5,500; R. C. Vaughan & Son, 2 pair semi-detached 2 storey brick dwellings, Summerhill, $7,000; J. H. Stanford, 2 storey and attic brick dwelling, Oriole road, $4,500; Glidden Varnish Company, 1 storey brick melting house, Wal[illegible] avenue, $[illegible]; C. Weston, [illegible] factory, corner Peter and Richmond, $40,000; D. M. McConkey, 3 attached 2 storey brick dwellings, Palmerston Gardens, $[illegible]; J. A. Duggan, 3 attached 2 storey brick dwellings and 2 storey brick store, corner Sorauren and Geoffrey, $8,000; Geo. E. Case, 2 detached 2 storey and attic brick dwellings, corner Indian and Westminster, $8,000; H. Disston & Sons, 1 storey brick factory, Fraser, $6,000; Toronto General Hospital, 1 storey brick emergency building and 2 storey brick patients' building, College, $130,000; Hewitson & Proctor, pair semi-detached 2 storey brick and stucco dwellings, Ingham avenue, $7,000; A. Edmunds, pair semi-detached 2 storey brick dwellings, Symington, $5,800; K. McWhinney, 26 semi-detached 2 storey cement dwellings, Laughton, $46,800; S. Stewart, 2 storey and attic brick dwelling, Glen road, $6,500; M. T. Kent, 2½ storey brick dwelling, Walmer road hill, $6,100; Faramel, Limited, 1 storey brick elevator and warehouse, Dupont street, $15,000; H. W. McDonald, 2 storey brick bank and dwelling, corner Bloor and St. Clarens, $10,000; Massey-Harris Company, 1 storey brick addition to printing office, corner King and Strachan, $5,000; Thos. Hill, pair semi-detached 2 storey brick dwellings, Hillsborough, $5,000; H. L. Kerr, 2½ storey brick dwelling, Roxborough east, $15,000; N. Labracco, pair semi-detached 2 storey and attic brick stores and dwellings, Elm street, $5,000; A. A. Kennedy, 3 attached 2 storey brick dwellings, Concord avenue, $6,000; Toronto Carpet Company, 2 storey brick addition to warehouse, King street west, $15,000; J. A. Orr, pair semi-detached 2 storey brick dwellings and 2 storey brick dwelling, Garden avenue, $6,000; Consolidated Plate Glass Company, 5 storey brick warehouse, Spadina avenue, $60,000.

Vancouver, B.C.

Under the terms of the contract awarded by the Dominion Government to William Simons & Company, Renfrew, Scotland, for the large bucket ladder dredge to be used in the Narrows at the entrance to Burrard Inlet, the dredge is to be delivered at Vancouver within six months. As delivery entails a long trip of 10,000 miles, which will be made under the vessel's own steam, construction will be started immediately. Heavy penalties for delay are included in the contract signed. The Scottish firm tendered for the dredge through their Canadian agents, Messrs. John Reid & Company, of Montreal. The dredge will be the largest and most powerful on the Pacific seaboard. Messrs. Simons & Company were recently awarded a contract for the construction of a large bucket ladder dredge, similar to the one intended for Vancouver, to be used on the Panama canal.

Winnipeg, Man.

Tenders addressed to J. D. McLean, secretary, Department of Indian Affairs, Ottawa, will be received until October 27th for spruce timber on the Crane River Indian Reserve, Man.

Permits issued recently are as follows: G. Jones, dwelling, west side Home, $3,800; Barker & Anderson, dwelling, west side of Horne, $2,000; M. Montgomery, dwelling, west side of Agnes, $2,000; A. G. Davidson, dwelling, west side of Craig, $2,000; F. Swanson, dwelling, west side of Home, $2,500; Borland Bros., dwelling, south side of McDermot, $2,000;

AWARDED

Moose Jaw, Sask.

[illegible] Company, [illegible] for the supply of [illegible] ed.

Laying C. I. Pipe Culverts in Soft Ground

Suggestive Ideas Obtainable from Practice of Prominent Railroad Engineers —Essential to Provide Substantial Foundation—Methods of Repairing Pipe

Some time ago the American Railway Bridge & Building Association appointed a committee to gather data on methods of preventing cast-iron pipe culverts from pulling apart in soft ground and on the ways of repairing them when pulled apart. A large number of engineers stated that they take great care in placing such culverts in soft ground to provide a substantial foundation under the pipe; old bridge timbers or ties are used for grillage and a cradle, a concrete foundation is placed under the entire pipe, or concrete piers under the joints, thus practically avoiding the danger of pulling apart.

A number of roads clamp the pipe together longitudinally, where it is liable to pull apart, by passing two or more rods fitted with turnbuckles through the inside of the culvert and hooking them over the extreme ends. The rods are then taken up by the turnbuckles. This method is also used to draw pipes together after they have pulled apart. Many, however, advocate digging up the pipe and relaying, or digging down to the joint and repairing with concrete.

The following paragraphs from some of the replies are taken from the appendix to the committee's report:

Mr. W. C. Cushing, chief engineer, maintenance of way, Pennsylvania Lines West, advises the folowing method: In placing cast-iron pipe 24 inches or more in diameter, build under each joint a block of concrete 12 inches thick, 24 inches wide and 48 inches long, parallel with the track. The pipe should be laid in position before the concrete is placed, so that it will get a good bond on the hub. The ground around the pipe, for its full length, should carefully tamped. Where pipes are put in under tracks in service the stringers supporting the track should be left in place for several months, until the ground has become well settled around the pipe, before the full weight is thrown on it.

In slips the best method of holding the pipe in place is to carry the small concrete piers to the bottom of the slip, if this is not too deep. In cases where the slips have been deep he has driven pile foundations, three piles in a row, spaced 2 feet on centres, parallel with the track, and spaced 4 feet centre to centre parallel with the pipe. The top of the piles were concreted and the pipe laid on the concrete. Where a culvert in a slip was treated as above, in 1907, no movement has since occurred, either in the pipe or in the slip.

Mr. R. G. Develin, assistant engineer, maintenance of way, Pennsylvania Railroad, described a case where a 24-inch culvert separated. It was put back and clamped by placing two split collars around it, one on each side of the joint in question. These collars were connected by a 1-inch bolt above and below the pipe. Wedges were driven between the collars and the pipe to prevent slipping of the former.

In another case where joints spread, due to the settlement of a fill, the joints were exposed, concrete placed around them and parapet walls built at the ends.

On the mountains or where culverts have much fall the pipe is clamped together with three 3 x ¾ x 16-inch flats attached to the pipe by bolts passing through the pipe. Clamps are not placed on the bottom, where a smooth surface is desired. This method, Mr. Develin states, has been used for years and no trouble has been experienced with pipe pulling apart.

Mr. D. C. Zook, of the Pennsylvania Lines West, in his reply gives data on the use of a timber foundation. Our method, he states, where the ground is only moderately soft, is to lay a floor of track ties, placing the ties as close together as possible, to form a bearing of about 8 feet wide. On this we lay our pipe, on a saddle of square timber. These pieces of timber are chamfered to conform to the curvature of the pipe as nearly as possible.

When, in our judgment, the ground is too soft to allow this mode of construction, we drive two-pile bents at about 6 feet centres, our pipe being 12 feet long. We cap those piles and on this foundation lay our pipe, supporting it between bents with the saddle already mentioned made of 12 x 12-inch timber fitted up to each side of the pipe and securely fastened to the cap. The object of the timber is to afford additional bearing to the pipe and prevent it from crushing.

We have already obtained good results from these methods and have never had any trouble where they were used, although when we first began using cast-iron pipe for this purpose we had trouble with our pipes sinking, as they were not supported other than by earth. We then had to dig them out and support them, as I have indicated.

Mr. S. C. Bowers, Pittsburg, Cincinnati, Chicago & St. Louis Railroad.—In slips the method of holding pipe has to be determined by the depth to solid material. We had a case of pipe pulling apart in a slip where solid ground was about 6 feet below the bottom of the pipe. In this case we excavated down to the rock and into it about 6 inches, and built up small concrete piers under the joints. The pipe had pulled apart about 2 feet before this was done. The work was done early in 1908, and there has been no trouble since.

Where the slip is too deep to excavate, piles should be driven, three in a row, 2 feet on centres parallel with track and 4 feet on centres parallel with pipe. Then concrete should be placed on top of these and the pipe laid in the concrete. This method was used in 1907 at a slip and there has been no movement since. This is not only a preventive from pulling apart, but also keeps the slip from moving.

Mr. B. F. Gehr, Pittsburg, Cincinnati, Chicago & St. Louis Railroad.—My experience with laying cast-iron pipe in soft ground is to place a concrete pier just back of each bell; and, if under a heavy fill, also at the centre of the pipe section, on a uniform grade. If the soil is such that it is necessary to build concrete piers and there is still fear of settling a small amount under the track, it is well to leave the line of pipe crowning in the centre. In addition, holes may be drilled in ends of the pipe and ¾-inch rods may be run through from the inside and bent over on the outside. I would use four clamps at each joint for a 3-foot pipe and more or less according to the size of the pipe.

Disagreeable tastes and odors in the water supply from the high service reservoir at Lowell, Mass., during the winter of 1909, were due, it is thought, to algae which had remained in the basin since the previous summer. To remedy the trouble, as much of the old water as possible was first drawn out and a thin coating of ice over the surface was broken by rowing a boat through it several times. This was done, according to the last annual report of Mr. Robert J. Thomas, the superintendent, to expose the water to the action of the air. In eight days the reservoir was filled with fresh water to its regular depth. No further complaint is said to have been made regarding the supply.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone

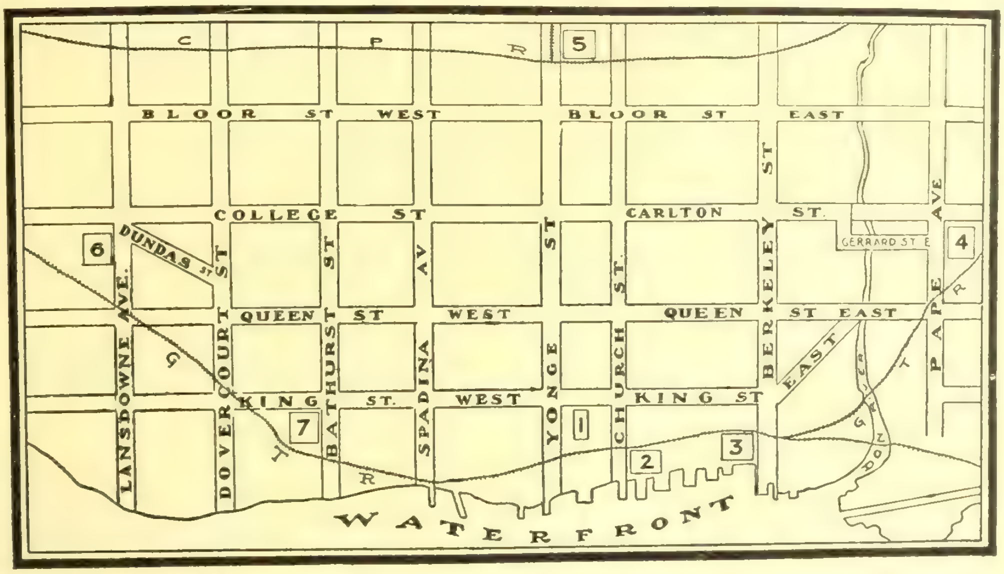
Main

4

1

5

5



No's

2,

4,

5,

6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is

PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

CONTRACTORS' PLANT

BOILERS

PUMPS

TANKS

CONDENSERS

WORKS: MONTREAL

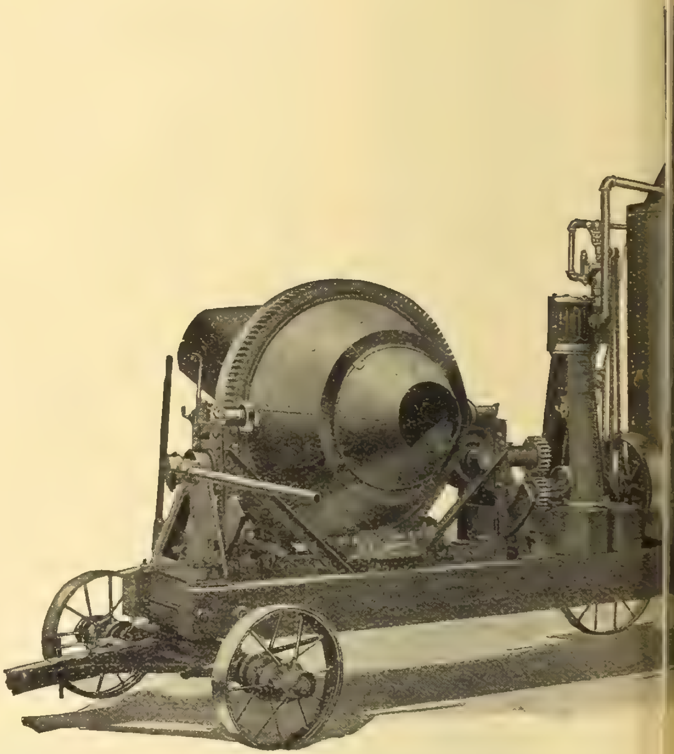
THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.

Limited

THE SMITH

We make the Smith Mixer in four sizes mixing from 50 to 300 yards per day, and mounted in any style and with any combination of power. :: ::

Write for catalogue

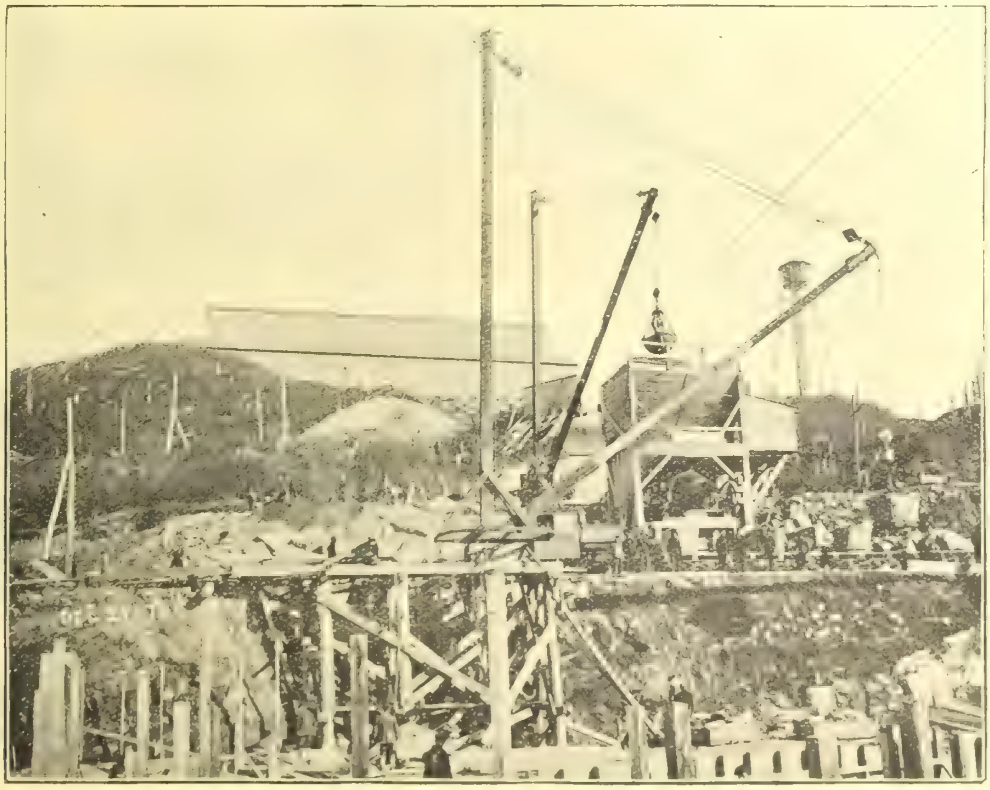


When there is one mixer made that has never been known to fa
When that mixer has withstood all manner of competiti
When that mixer is being sold in larger numbers than ever befo
When the use of that mixer is a point in your favour with t
architect and engineer.

Head Offices and Warehouses :
Montreal

MUSSEN

S SUPREME



Smith Mixer at Work on a Large Power Dam.

hen that is the mixer you ought to buy, and it is the SMITH. xperience teaches that the possession of a reliable and thorough oncrete Mixer is of the greatest importance to a contractor. lany Contractors have bought their experience and are now using mith's, as they find them the only mixers that can be relied on.

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The Hamilton Steel & Iron Co. Limited
Hamilton - Canada

Rounds, Squares, Twisted Squares, Maxwell Deformed Bar

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS for Reinforcing Concrete

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
J. R. HOOPER, Representative.
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto October 26, 1910 No. 43

"Wake up, England!"

At a recent annual meeting of the North Staffordshire Chamber of Commerce, Major A. E. Blizzard, managing director of Messrs. George Woolliscroft & Son, Limited, delivered an address, which should be particularly instructive and beneficial to his countrymen in general.

Readers of the "Contract Record" will require no introduction to the Woolliscroft firm, but it may be as well to state that the company has an extensive plant at Hanley, in Staffordshire, where roof, floor and glazed tiles, terra cotta, Faience, mosaic, and other products of world-wide reputation are turned out. The firm is paying particular attention to Canada, and it was in this connection that Major Blizzard paid a visit to this country earlier in the season. Upon his return he made a number of pointed observations. It was inevitable, he said, that with the development of Canadian trade and the natural expansion of local industries, many of the statements of imports from the mother country should show a decrease. At the same time, however, he advised his hearers to strengthen their hold on the market as far as possible. He found, he said, a general desire amongst business men to increase business with England. But there were many complaints of old country methods, chiefly in the matter of delivery. He had asked for some concrete cases, because general remarks very often flew about and amounted to very little. An important business man had told him that galvanized iron was sent in to him in cases, and the manufacturers in England would not send it to him in bundles. Consequently that manufacturer ceased ordering from that particular source, and his order went to another country. He wanted a particular knife which was used in the skinning and ranching business, and which he could not get in England, and had to get in another country. This gentleman also showed him an order for chains and anvils which had been given some months previously, and in one case there had been no acknowledgement of the order. An order given for sanitary ware in June, 1909, had not been delivered in June, 1910, and another sanitary order which was wanted promptly was given in March, and not executed in June. Canada could get very prompt deliveries of goods ordered from the United States. Those were very serious complaints, and were specific cases about which there could be no doubt.

There still remains another indictment of British traders, which is that they do not readily adapt themselves on the spot to Canadian business methods. This mistake is not made by American manufacturers. Altogether Great Britain will have to wake up if she is not to find herself supplanted in the Canadian market by the United States, which have the advantage of proximity, promptness of delivery, and adaptability. Efforts are being made by the Dominion Government to people its territories from the Mother Country, but the latter must help in more ways than in mere emigration.

An Instructive Discussion

Whether municipal work is done more cheaply and more satisfactorily by contract than by day labor:—that is the question. A familiar one it is, but it is presenting itself in many new aspects to readers of the "Contract Record." Engineers and contractors will derive appreciable benefit, not only from following this discussion closely, but by participating actively in it. The preparation of such letters as are contributed to this issue by A. W. Godson (Toronto), A. J. Latornell (Edmonton), and others, induces careful reflection, and tends to give the writer, even more than the reader, a better and broader conception of what is undeniably one of the most vitally important matters before the interests concerned. Whatever differences of opinion there may be between the writer and the reader, the latter will at least admit that the former has the courage of his convictions. The avoidance of publicity is only to be commended in certain well defined instances. In matters of vital interest to his profession at large, a man should give proof of having some identity and not be afraid to submit his views. We should indeed be an unenlightened community and make poor progress if everyone refused to impart his experience for the benefit of his fellow-worker. We trust that this incidental observation may lead those of wide experience, but reticent tendencies, to contribute to the discussion.

Rumors, as they Affect Labor Conditions

Railway construction in the west is hampered by the lack of men, and doubtless some of the contractors on the Government roads would welcome the introduction of Asiatics as a means of solving the problem. A Toronto paper thinks that the contractors have themselves to blame for the scarcity of labor, and, on the strength of "many rumors," discusses the alleged unsatisfactory conditions existing in construction camps, enumerating certain charges made against contractors by the men. The article concludes: "Instances are cited where hundreds of workmen have refused to work under such conditions and have left the camps."

The dissemination of such "news" as this is inimical to the interests of the country. Rumors [illegible] at any time, but coming at this juncture and [illegible]

[illegible] as are most stories the origin and veracity of which are doubtful, they are particularly undesirable.. The merest allegation of this kind is sufficient to deter many who would otherwise seek this kind of employment. We would strongly advise those of our readers interested in railroad construction to give this matter some consideration, with a view to taking steps tc counteract this harmful influence.

Engineers and the Press

The Ottawa branch of the Canadian Society of Civil Engineers are discussing the advisability of closing their doors to representatives of the daily press. It is contended by one faction that the reporters should be admitted, as many things are discussed that are of much interest to the public; and by the other that they should be excluded, on the ground that they make such a hash of technical matter. We understand that a decision has been left with the executive. Our own impression is, as one might expect, that the interests of publicity should not be made to suffer for the occasional distortion of a technical matter. A little co-operation in the latter connection would mean a great deal. If members of the profession are sufficiently interested in being reported correctly they will take the trouble to see that the newspaper man is properly provided with the gist of their remarks and that he gets it down correctly. This is the day of the newspaper man. He is ubiquitous; and seeing that he will not let one work without him, there is only one alternative, and that is to work with him.

The Contract System Versus Day Labor

Toronto Contractor Defends his Position—Some Pointed Observations and Open Queries — Municipal Engineers' Views — "Construction Department" Suggested

The letter written by Mr. Charles Curtis, of the Western Pavers, Limited, Winnipeg, published in our issue of September 14, is resulting in a most interesting and instructive discussion. Mr. Curtis contended, it may be remembered, that if the city engineer was to estimate on the work of his own department, he should be compelled to bid under the same restrictions that are laid upon contractors. The writer cited an interesting case from his own experience, and after stating that the contractor, by reason of his specific experience, was the best man to handle city work, concluded in part as follows: "City engineers have admitted to me that they would rather see work left undone than have it carried out by day labor." This is somewhat at variance with the expression of Mr. G. G. Powell, principal Assistant City Engineer, of Toronto, who, writing in our issue of the 12th inst., says: "Day labor work is becoming so popular in some cities that the citizens themselves are requesting that local improvements be done by day labor instead of by contract." Mr. Powell contends that the engineer and the contractor *do bid on even terms*. Mr. Powell's letter was in criticism of one contributed to our issue of September 28, by Mr. A. W. Godson, of Toronto, who held that it was unfair for the engineer to tender against the contractor, there being so many circumstances and opportunities favoring the former in the execution of the work. Mr. Powell's statements, however, by no means convince Mr. Godson, who puts up some stiff arguments in a letter published in the following columns. After reading this letter an unbiased reader will surely be disposed to wonder whether the advocates of day labor will be able to stand their ground.

There is one particularly noteworthy suggestion made by Mr. A. J. Latornell, City Engineer of Edmonton. This is for cities to establish a construction department, an organization complete in itself and separate from the department responsible for design and supervision.

Contractor Godson Hits the Nail on the Head.

Toronto, October 14, 1910.

Editor, "Contract Record":

I notice in your last issue, Mr. Powell's criticism of a letter written by me at your request giving my opinion as to the advisability of engineers doing civic work themselves—as it is termed by day labor. Before going into further details I desire to impress upon you the fact that I have the most friendly regard for our city engineer and his subordinates, but I do feel, and complain of, the unfairness of our city specifications and the system which requires the engineer to compete for work as a contractor.

If you have not already obtained a copy of these specifications for the different road work, I would ask you to get one, and I think you will agree with me that it is entirely one-sided, as against the contractor. It stipulates that the city engineer shall be sole judge and arbitrator in case of any misunderstanding between the contractor and the city, and it requires that the different materials entering into the work comply with certain conditions and tests made by the city. The contractor then uses the material without further question after the same has been approved, and proceeds with his work, which calls also for a guarantee for maintenance of from five to ten years.

If this work proves to be faulty within the guarantee period, the contractor is called upon to make repairs or have them done by the city at his expense, and the amount deducted from any drawbacks or money coming to him from the city.

Take a brick pavement for instance, where the bricks have been inspected and, as the contractor supposes, subjected to the tests called for by the department and passed by them as being up to the required standard: Is it fair to hold the contractor responsible for repairs due entirely to their inferiority? Is it not enough to hold him responsible for his workmanship? Surely when he has paid the manufacturer for them on the basis of their having passed the city's tests, he should not be held responsible for anything faulty on their part. This is one of my contentions: we are not allowed to put anything into the works that is not up to standard and city tests. Why, then, should we be further held to make good when the only fault in the work is due to the poor quality of the material passed by the city officials as O. K.

As I stated in my former letter, although all our material has to comply with the specifications, and exacting as these are, the city employs from one to three inspectors on contract work: one, perhaps to see that the subgrade is according to plan, another to look after the laying of curb and gutter, and another to see that the correct quantities of cement, sand and stone are used and properly incorporated, as called for by the specifications.

When this has all been done you would think the contractor had done his duty and was entitled to his money, and so

I think. Contractors, however, as a rule have sufficient faith in their engineer to guarantee the work, feeling that where a fault, if any, shows later and is beyond question not due to their work, that they will not be held responsible, and that is where the city holds, or expects to hold, the winning card.

Years ago when Mr. Frank Shanly was city engineer, he spoke to me about the one-sided aspect of the specifications. "It may be necessary," he said, "to hold a troublesome contractor, and the clause may be used, but where a desire is shown to do good honest work I hold a contractor only to the spirit of my specifications." Since then, year in and year out, these specifications have been added to and revised apparently with the object of putting all contractors out of business. Why should it be so, if there is nothing further than an engineer's desire to do his own construction work? You see what the contractors have to submit to in the way of inspection. Do you suppose that the city is employing inspectors, and paying them to help contractors, to make money at the expense of the constructional part of it—I think not.

Do you think it safer to put a gang of men on to do the work by day labor under the sole control and inspection of a foreman, and the occasional visit of the engineer himself?

I am sorry Mr. Powell has read my letter to construe dishonesty on the part of the engineer or his foreman, but I do contend that the city engineer and his staff cannot be more anxious to secure stable work than a reputable contractor, who has these specifications and guarantees to contend against.

The fact that the city's foremen knows nothing about the estimated or contracted cost of the work does not acquit him of a desire to make a reputation for hustling it along, and doing it cheaply—perhaps too cheaply.

Is it fair and in the interest of the community to employ public money to destroy private enterprise? A continuance of these methods will certainly result in this. My ambition has been to build up a business, and after acquiring a very large plant and equipment for carrying out public works required in this and other cities, it seems hard to find a disposition on the part of our engineers to crowd us out, thereby not only making us lose our money, but destroying the result of many years' work and enterprise.

I trust that this letter, which contains my views on this vexed question, may not give offence to anyone, but that it may be received as an honest and out-spoken expression of opinion.

Yours very truly,
A. W. Godson.

P.S.—It may be well to direct your attention to the fact that only the lowest tenders are accepted by the city. Why, then, not give the contractor credit for having saved for the city the difference between his tender and the next lowest? In our work alone we can show a [illegible] thousand dollars a year, for which the city has benefited by the contract system. A.W.G.

An Engineer's Admissions and Suggestions.

Edmonton, Oct. 10, 1910.

Editor, "Contract Record":

I have read with considerable interest Mr. A. W. Godson's letter, published in your issue of Sept. 28th. I do not fully agree with all that Mr. Godson says, but this is hardly to be expected, as he speaks from the contractor's point of view. However, it must be admitted that there are a great many things about the engineer's estimate that are open to criticism.

The system has objections both from the standpoint of the engineer and from that of the contractor. The contractor's main objection is that he is placed on an unfair basis, that the engineer is bidding on work which he himself will control, and consequently is in a position to deal leniently with himself; in other words, the engineer is not governed by the specification under which the work is obtained. The result might be a very inferior job.

Another objection that might be raised on behalf of the contractor is that the engineer runs no financial risk, and that if the work should cost no more than his bid, he does not pay for it out of hi sown pocket, as the contractor must do. Briefly, there are two ways of taking care of a low estimate: first, to do the work honestly according to plans and specifications, making up the loss from some other source; secondly to skimp the job so as to come within the estimate. One of these methods is honest, the other dishonest. The engineer who practices the latter method, because he may do so, and the contractor who attempts the same thing, because he hopes he may accomplish it in spite of inspection or the restraining power of the engineer, are equally dishonest. The only difference is that it is easier for the one to succeed than the other.

The aim should be to adopt such method of doing work as will give the best grade of work at the lowest possible cost. In my opinion, the question is very closely associated with that of municipal versus private ownership. Where work is undertaken by a municipality by day labor, it is usually done because it is assumed that it can be carried out more cheaply than by contract, for the reason there are no profits to be made—just as in the municipal ownership it is assumed that cheaper service can be given the people because there are no dividends to pay. If it is true in the one case, why not in the other?

I believe, however, that it is desirable to eliminate from the method of securing this work certain features which are more or less objectionable to the engineer as well as to the contractor. The engineer does not like to feel that he is awarded the work, owing to a handicap having been placed on all other bidders; nor does he like to feel that, even though he may carry out the work strictly to the plans and specifications, the method leaves him open to the charge of being lenient with himself. In this connection I might point out that the engineer has always a strong incentive to do good work, from the fact that as long as he holds his position he must stand behind and maintain that work.

Most cities find it necessary to do some day labor work and to keep a quantity of plant, tools and machinery on hand. Also, they must have a number of foremen and other officials constantly in their employ. It is desiarble, where it can be be done to advantage, to carry on enough work to keep these occupied constantly.

There are two methods of deciding to do work by day labor: first, to make the decision without calling for tenders; second, to call for tenders and award the contract to the engineer, provided he is the lowest bidder. The first method is open to the objection that if no estimated cost is fixed before the work is started, it may lend itself to the inefficient prosecution of the work, resulting in costly construction. The second method is the one to which Mr. Godson, with some reason, takes exception.

A method which, it seems to me, should eliminate these objections would be for the city to have a Construction Department absolutely distinct and separate from the Engineering Department, who design and supervise the construction of the work. It is desirable, in my opinion, that the party concerned with obtaining good workmanship should have no interest in the quantity of work done per day or in the financial side of the work. Let one side look after the quality, the other will look after the finances. Quantity and quality are the two chief elements that enter into construction work and these should be properly balanced. Quality must not be sacrificed to quantity; neither must quantity be sacrificed to quality by striving to obtain such a state of perfection as would make the cost of the work beyond reason. This balance may be obtained by having one expert control both the essentials, but probably it would be better obtained by having quality looked after by one party, and quantity, or rate of progress, by another. It should be the aim, first of all, to do good work, and then to accomplish as much of this good work as possible per day..

A construction Department, as separate from the Engineering Department, should be financed by the city at large, just as a contracting firm would be financed by its shareholders. It would bid on the work on behalf of the municipality, and the price bid would be the price charged up to this work. In the case of a loss it should be charged to the General Fund. If on the other hand there should be a gain, i.e., the work completed below the price tendered, the difference between the actual cost and the price bid should be credited to the General Fund. The Engineering Department would supervise and inspect the work, and pass estimates in favor of this company in the same way as they would do were the work being done by a private contrastor. In other words they would be placed in competition with all other contractors on an equal basis. It should be the aim of the municipality not to discourage bidding on work by private contractors, for, without this, competition would be eliminated, and all the worst features of the day labor system would probably make their appearance.

Yours truly,
A. J. Latornell,
City Engineer.

A Satisfactory Arbitration Clause.

New Westminster, B. C., Oct. 11, 1910.

Editor, "Contract Record":

I have read carefully Mr. Godson's letter, published in your issue of September 28, and agree with the writer on certain points. I certainly think that it should be the aim of every engineer to write a clear concise specification, leaving no doubt as to the kind of construction he requires.

With regard to the Arbitration Clause, I never allow myself to be sole arbitrator, as I consider that it puts the engineer in a position which would weaken his case should there be any legal proceedings.

The clause that I always insert is as follows:

"If at any time during the progress of the works or after their completion, there should be any disputes or differences in opinion respecting the true intent and meaning of any part of the Contract or this Specification, or with regard to the quality of the material or workmanship, or with respect to anything affecting the carrying out of the works comprised in or connected with this Contract, such dispute may be finally and conclusively settled by the decision of three (3) Arbitrators, the first to be appointed by the Corporation, the second by the Contractor, and the third by the two Arbitrators then chosen. In case the two first chosen fail to agree upon a third, the latter shall be appointed by a Judge of the County Court of the City of New Westminster. By the decision of these three Arbitrators, or by the ruling of the majority of them, both parties of this Agreement shall be finally bound."

I think this clause is perfectly fair and gives the contractor a chance to have any dispute fairly judged.

Unreasonable clauses in my opinion no doubt weaken the engineer's case in the case of a dispute.

Yours truly,
J. W. B. Blackman,
City Engineer.

"Sound Business Wisdom to Have the Engineer Tender."

Editor, "Contract Record":

I have read with interest the letters of A. W. Godson and "R. W.," appearing in your issue of September 28.

The system of having a city engineer tender upon work in open competition against contractors, seems to me a wise step, and I fail to see any legitimate cause of complaint against it. As a city engineer of some years' experience, I found that when I tendered on any work, the competing contractors were proportionately lower in their bids than they had been heretofore; further, that on occasions where the bidding was liable to be shared by only a few contractors the fact that I was bidding on behalf of the city prevented any pre-arrangement of bids.

Mr. Godson's assertion that poor workmanship and material are put into the work by the city engineer if he underbids the contractor, does not bear the appearance of fact. The engineer, of all men, is the one most interested in having his design properly executed in every way, for upon the results he is adjudged competent or incompetent.

As far as the ratepayer is concerned, he reaps the advantage, as he is saved both the contrator's profit and the salary of the inspectors.

To sum up, I consider it sound business wisdom to have the engineer tender on all works that he can undertake, placing him on the same footing as the competing contractor, as to time limit and cost. In a properly conducted civic enterprise, all orders for materials and plant, time sheets, etc., pass through the storekeeper or city clerk's department, where they are audited and checked, thus preventing improper and dishonest practices, such as are hinted at in the correspondence in question.

Yours truly,
An Ex-City Engineer.

Value of Good Workmanship in Cement Floors

Good workmanship is seldom more essential to good results than in the laying of granolithic floor finish. An engineer and mill architect, reporting his own experience and observance, said:

"There is a tremendous difference in the wearing qualities of cement finish, and I believe it is largely a matter of workmanship. To wear well, in my opinion, the top finish must be much more thoroughly trowelled than is customary among cement finishers. I also seem to find that a finish made only with cement and sand, like the ordinary sidewalk, does not stand the trucking nearly so well as where we get in as much stone as possible. We have found also that it is an absolute necessity to use in the finish as hard a grade of stone as we can get to have a floor that will stand.

"The average cement finisher dislikes to work with stone in the top finish. I would not object so much to the wearing down of the top finish if I knew of some practical way for repairing it. When the top finish is removed and we attempt to put a new one down, it is always more or less of a gamble as to whether the repaired finish will stand up under the trucks."

A suspension footbridge, 435 feet long, built of discarded ¾-inch derrick cables, has been erected across the north fork of the Feather river, Cal., near the masonry dam now under construction for the Great Western Power Company. The main cables consist of two groups of three ¾-inch cables each, and the suspenders are 3/8-inch wire rope. The floor is 2 feet wide and bracing is provided under it to prevent twisting. Wire fencing is placed on both sides of the walk. The towers are of timber. The main cables are anchored to old rails concreted solidly into a cross tunnel driven through the rock.

Carborundum cement was placed on steps at the entrance to one of the stations of the Metropolitan Railway in Paris in 1905 to determine its wearing qualities. According to the "Annales des Travaux Publics de Belgigue," the stairs, after being used by at least 50,000,000 people, showed no appreciable wear; this type of construction, it is stated, has been adopted by the Metropolitan Railway for all its new stations.

Collapsible Mold for Sewers and Culverts

Constructional Details of a Simple Device for Facilitating Form Work —Economical and Readily Adaptable—Valuable to Concrete Workers

By A. A. Houghton

The necessity of getting up and taking down forms in making this class of concrete work is a large waste of time, in addition to the great amount of lumber required.

With the simple form described and illustrated in this article, which can be constructed by any one in a short time and at a slight expense, the labor in handling forms when molding all classes of bridges, sewers and culverts will be saved, as in a moment's time the form can be placed in position to mold a section, and by simply removing the "key" blocks the form will neatly fold together so that it can be removed and used again without delay in construction.

Another advantage is the slight amount of lumber required. In building a sewer several forms can be used, and by working at both ends of the sewer, or starting work in the middle of same, while the concrete is setting over one form, the other can be removed from previous section molded and set in position ready to mold another section.

The use of a pin hinge in fastening the sections together will allow them to be taken apart into six sections, easily, when necessary to handle same in a difficult part of sewer, as well as to set up in such a place easily.

This form should greatly facilitate the work as it will remove the necessity of a gang of men in building forms, and where the grade is understood, any laborer can remove from section molded and set in position for the next section in a very short time, thus enabling the contractor to put in an increased amount of work, with less help each day.

To illustrate the manner of construction we will take a size with a breadth of 6 feet 9 inches and a height of 3 feet 4½ inches when completed and give measurements for that size.

First, it will require for each section 24 one-twelfth segments of a circle, as four setts of six each are used as supports to each section. The easiest manner to cut these, for this size, is to cut twenty-ofur pieces of 8-inch plank, two inches thick and 19½ inches long; take one of these for a pattern and on it at each end make a mark 1½ inches from the top or one side; in this one and one-half inch space draw a semi-oval line from the marks at each end so as to bring the highest point of same in the centre of the top edge of plank; this will give you a one-twelf segment of a circle the required diameter. In mitering same, mark 1½ inches from each end along the bottom of the plank; draw a line from this to the end of the oval line at top and when this three-cornered piece is cut off it will make a miter that is correct for the purpose. The plank is cut along the lines drawn, making the one-twelfth segement of circle complete and correct. Use this one as a pattern in cutting the others.

Now supposing the length to be 12 feet of the completed section use lumber 2 inches wide and 1½ inches thick, of this length, lay four of the segments of circle with oval sides up at equal distance apart and cover with the 12-foot lumber, nailing on top. The oval segments should be so covered as to leave one-half inch projecting on each side, this is planed down on one edge, in a bevel, even with the ends of the supporting timbers so as to make a tight joint when they are joined together.

After completing the six sections in the above manner join them together with a hinge on each support as illustrated in Fig. 1 and Fig. 2, requiring twenty hinges. As illustrated in Fig. 1, the hinges are all placed on the bottom side of supports, except those in the centre on top; these must be on the outside to enable it to fold together. By using a flat strap hinge for this, there will be very little mark left in the completed work.

For the cross supports cut four strips of 2 x 4 inch lumber (these should be strong enough for this size of section), 4 feet 10½ inches long. Cut these as follows: One foot from each end and the balance of strip in the centre, making four pieces, join together with the hinges as illustrated in Fig. 1 and Fig 2, putting one hinge on top of strip and two on bottom, at joints, and then fasten to the bottom supports with hinges, at bottom of strip and fastened to support at about the centre. This allows these cross supports to break down as illustrated in Fig. 2, and thus folds the section together.

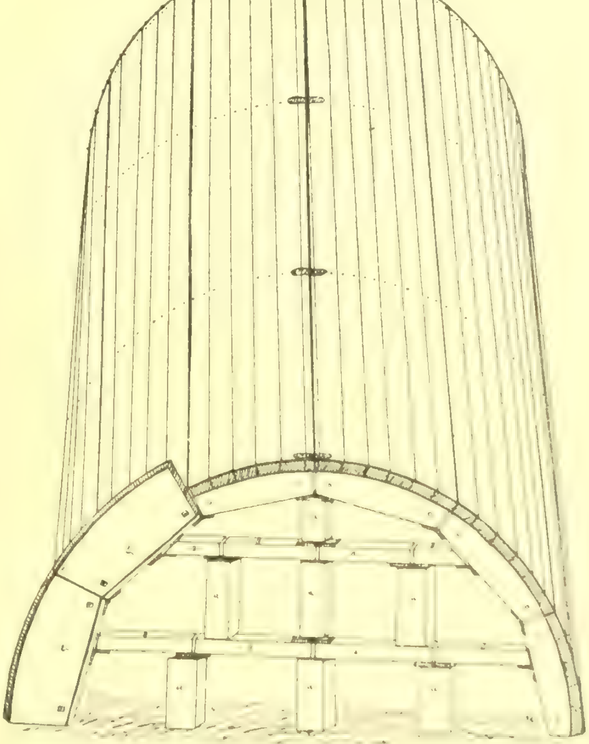


Fig. 1

The top cross strips or supports are cut from the same lumber (2 x 2) and 3 feet 6 inches long, and are divided into four pieces, in a proportionate manner as the bottom cross supports, and are hinged together and fastened to sections in the identical manner as the bottom ones. This allows both cross supports to fold down alike, and thus drawn in the sections together, so that it can be removed from the completed work in a very short time and without damage to the concrete.

As illustrated in Fig. 1, blocks marked (a) are used to hold the cross supports in position while the section is in use. These should be at least 4 x 4 inches and the proper length to closely fit into the spaces. As illustrated seven of these are used at each set of supports.

In removing the section or mold from the completed work, all that is necessary is to knock out these blocks, and by breaking down the cross supports the outside sections are folded in together. In setting up, the opposite method places and locks the entire form in position, and does away with fitting together a number of pieces, saving a large amount of unnecessary labor and expense, as well as a vast amount of time, as this form can be folded and unfolded very rapidly.

On the outside supports of the semi-oval section, bore a one-half inch hole at each end of the sections, as illustrated in Fig. 1. Through these holes bolts are placed to bolt on the guide forms at each end of which two are shown in position in Fig. 1. By having holes at each end of the complete section, the guide forms can be used on either end of mold, and removed at will, and by having them cut in six sections, as illustrated, they will not interfere with the folding of the main form when it is desired to leave them in place while removing the mold from completed work.

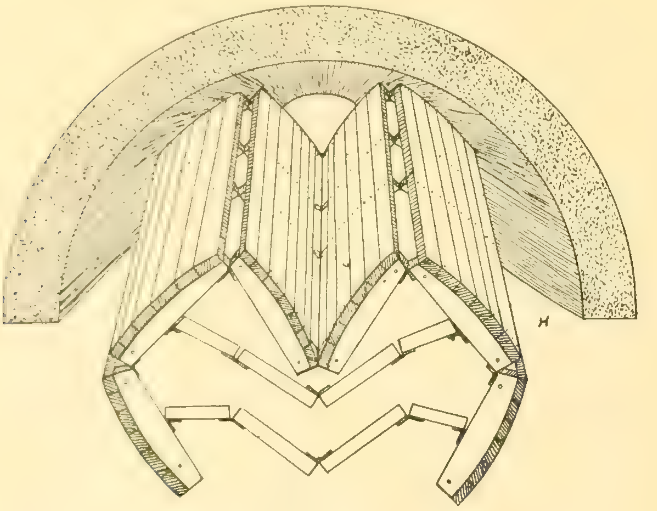


Fig. 2

This form is adaptable to any size of work desired, as any one can easily change the dimensions given to suit any large or smaller size of work that it is desired to mold. The size of lumbe rused must be increased in proportion (except outside boards), as you increase the size of the form or mold, so as to secure the proper strength. This allows any reinforcment desired to be used in the work, and will not interfere with any design of bridge.

For casting a number of bridges of the same size, as in railway culverts, this would be of great value as it is always ready for use at a moment's notice, and the one form does for all, without the necessity of a gang of men to build the forms.

In all form of sewer work (except tunnels) it should be of great value to the contractor, as with several forms in use he can keep his concrete workers busy all the time without the expense of hiring form builders, resulting in a saving of time, labor and expense and with the advantage of completing the work with greater rapidity.

The Minister of Railways has warned the C. P. R. that unless construction is commenced within eighteen months route approvals for the second C. P. R. line from Toronto eastward may be cancelled.

Maintenance Guarantees*

I am firmly of the opinion that pavement guarantees extending beyond a term of one year, which is ample to test the integrity of material and construction, are against the best interests of the taxpayers. In support of this view, I offer the following reasons:

1st. Guarantees are always of doubtful legality. On assessment work, which is the basis of payment for over 75 per cent. of the street pavements laid in the United States and Canada, the courts have frequently if not generally declared maintenance guarantees to be illegal, because they provide for indirectly assessing abutting taxpayers for the cost of maintenance, which city charters usually say shall be paid for by the city at large.

2nd. There is always to be more or less dispute between the contractor and the city regarding the contractor's obligations to make certain repairs, especially when the damage done can even remotely be attributed to causes lying outside the jurisdiction of the contractor and the city as to the extent of repairs and nicety of condition of maintenance of the pavement which is proper under guarantee, cities generally endeavor to require under guarantees, cities generally endeavor to require contractors to make repairs to pavement surfaces that they would not think of making at the expense of the city.

3rd. When guarantees for maintenance are required, prudent, conservative contractors always include in their bids the interest on the cash retained, and the cost of the surety company bond premiums required by the city, and a sufficient amount to cover a conservative estimate of maintenance charges. It has been calculated that if surety company bonds for five years maintenance were required on all pavements laid in the United States and Canada, the premium, always added to the contractor's bid, would each year amount to more than a million dollars.

It has been suggested that in lieu of surety company bonds for guarantee, the cities retain 5 per cent. of the contract price. If this were generally adopted the cash retained by the cities would aggregate approximately $5,000,000 annually, and the interest alone on the accumulation of five-year guarantee periods would amount to $1,500,000. This bond premium, or interest, contractors must add to their prices just as surely as they must increase their prices when the cost of labor and materials advance. Generally speaking contractors, regardless of the estimated cost of maintenance, will add to what would otherwise be their contract prices the full amount retained by the city. Few contractors are sufficiently strong financially to have their capital tied up even when it is drawing interest. Such a system would drive the comparatively small, but reliable contractors out of business, and leave the field in possession of concerns that are financially strong enough to carry or negotiate for carrying the amount of money retained by the cities.

4th. Maintenance guarantees tend to produce lax inspection, or the loss of control of construction by the proper city officials, as the contractor in case of dispute or disagreement as to the methods of construction, will notify the city officials, that if he is not permitted to do the work in the way he thinks best he will not be responsible for the guarantee.

5th. Maintenance guarantees encourage the acceptance of proposals from incompetent or inexperienced contractors, and the selection of pavements of doubtful desirability. How often do we hear the statement made in connection with the awarding of street pavement contracts—"The contractor may not be reliable, or the pavement may not be successful, but we have the surety company bond, or the cash retained to back the five-year guarantee."

---

*Extract from paper by George C. Warren, before the American Society of Engineering Contractors.

In twenty-five years' experience in the street paving business I have seen many paving contract guarantees defaulted, but I have never seen a pavement made good through a guarantee bond or a cash retainer, when the pavement or the contractor failed, or when it was against the business interests of the contractor "to make good."

Finally the best interest of the city in the construction of pavements will be conserved, *as it is in all other classes of construction*, by the adoption of the following policy:

(a) Decide upon the form of construction best suited for each particular case.

(b) Prepare careful plans and specifications for the work, and give the construction the closest and best expert inspection and supervision.

(c) Take entire responsibility for the results. In the long run this policy will produce better pavements and at lower costs, than will the apparently attractive, but misleading maintenance guarantee system.

Modern Road Making

The following illustrates the efforts in England to meet in road making the conditions imposed by moror and trolley-car traffic:

A new and direct roadway is proposed between West Hartlepool and Middlesborough, near Newcastle, in the County of Northumberland, a direct line of 7¾ miles. In designing the roadway the engineer in charge has given attention to the possible development in both heavy, slow and fast vehicular and motor traffic, each of which demands separate consideration, and possibly different methods of road-surface treatment. The plan accordingly provides for a centre footpath 9 feet in width; on the east side of the footpath a road for motor and light, fast traffic, 24 feet in width; and on the west side of the footpath a road for heavy, slow traffic, 22 feet in width. This gives a width for highway purposes of 55 feet

A scheme similar to this will doubtless control future road making in England, and existing roads may be reconstructed on a corresponding plan. One of the chief advantages in separating the several kinds of traffic would be in permitting different methods of surfacing the roads to be used, and those best adapted to the traffic accommodated. Another advantage would be the lessening of the chances of accidents. A third advantage would be the greater speed permissible to fast travelling

Zinc as a Substitute for Mortar

It is stated that zinc instead of mortar was used for joining the stones of two elliptical arches of an eighty-two-foot span that supports a newly completed armored concrete bridge near Lyons, France.

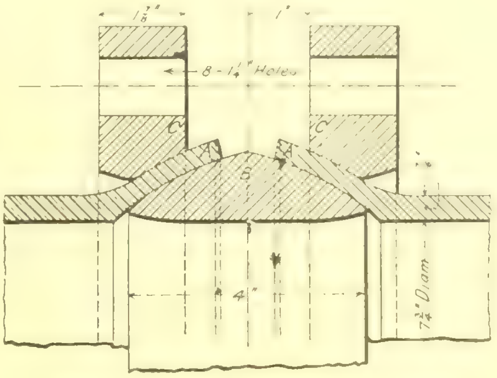
Previous experiment having proved that the molten zinc—at 800 degrees Fahrenheit—caused no fractures in dry stones, the zinc was melted and poured between the stones, forming metallic joints an eighth of an inch thick. The substitution for mortar increased the cost about $2 40 for each square foot of the bridge's horizontal surface.

Tests with cubical stones, 2½ inches on a side, show-of about 14,000 lbs. per square inch, but are 10 or 15 per cent. weaker than- stones having- a strength ed that zinc joints do not weaken stones having a strength between 14,000 and 18,500 lbs. A less compressible metal is needed for very hard stones.

Cement joints, when as thin as one-twenty-fifth of an inch or less, stood the tests equally well, but disintegration gradually reduces the original strength of joints of mortar.

Flexible High Pressure Pipe Joint

A special type of pipe joint for the reduction of damage by electrolysis is used in the new high pressure fire protection system at Baltimore, Md. One of the aims in its design has been to make the electrical conductivity of the joint approximately equal to that of the main body of the pipe. The system of fire mains may be operated either with fresh water from the city mains or, in case of emergency, with salt water. The pressure can be raised to 300 lbs. per square inch. The main supply pipes are 24 inches in diameter, 20 feet long and are made of soft open-hearth steel lap welded. As described in a paper before the Association of Civil Engineers of Cornell University, by Mr. Raymond Schlegel, the two ends of the pipe, AA in the accompanying sketch of an 8-inch pipe joint, are expanded and accurately machined to the same radius as that of the separating ring B. This ring, which is made from the same grade of steel as that of the pipe, is circular and has a cross-section as shown. The flanges, C, C, are made of medium open-hearth steel, having a tensile strength a little greater than that of the steel used for the pipes, being about from 60,000 to 68,000 lbs. per square inch. These flanges are accurately machined and the curved surface which is in contact with the pipe is made true, so that when the two adjacent pipes are deflected the contact between the pipe and the flange is fair and without strain. Preparatory to connecting these joints the rings are heated to a temperature sufficient to just melt the coating on the pipes and so secure a metal-to-metal contact in the joint. The ring is held in position by means of a rod screwed into a small tap hole provided at the peak of the ring, and the pipes brought together so as to bear firmly against the ring.



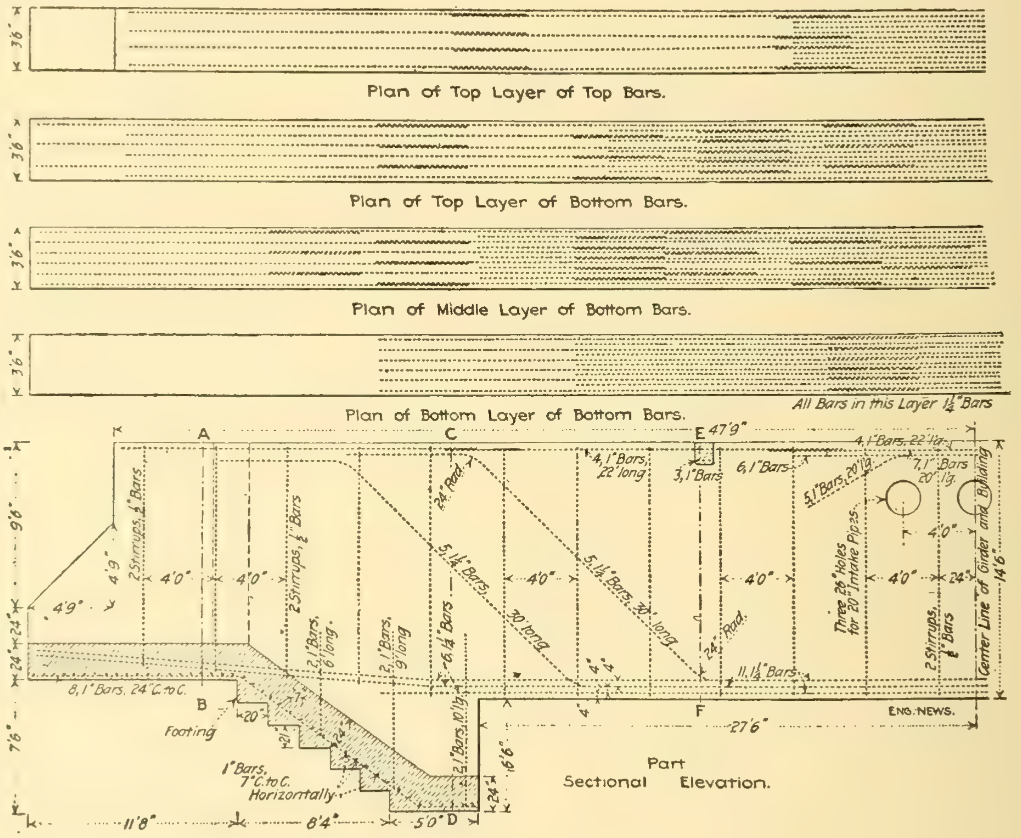
Joint for High Pressure Fire Mains

The bolts are then put into the flanges and the final tightening of the joint is made by the tightening of these flange bolts, without the use of lead, gasket, cement or any other filler. Another marked advantage, according to Mr. Schlegel, is its flexibility. Each joint permits a deflection of about 2 inches for each linear foot of pipe, so that by deflecting the pipe at the joint many obstructions in the ground are easily avoided. Tests of the joint were made at the plant of the Pittsburgh Valve, Foundry & Construction Company by raising one end of a jointed section so that three joints were suspended in the air. Under these conditions a test pressure of 1,000 lbs. per square inch is said to have shown no leakage.

A 105-foot Reinforced Concrete Girder

Noteworthy Construction at the Evansville, Ind., Waterworks Pumping Station Huge Girder Built in Twenty Days—Methods Employed

A remarkable piece of reinforced concrete construction is the great girder which now forms the foundation of the west wall of the waterworks pumping station at Evansville, Ind. It is 105 feet long, 3 feet 6 inches wide and 14 feet 6 inches deep, with footing 20 by 25 feet, and it spans the filling of an old trench, the settlement of which, after a break in the intake pipes, had caused the failure of the wall.



Steel Reinforcement of 105-foot Concrete Girder

The pumping station is a brick structure, with stone trimmings and a steep steel roof covered with slate. It is about 95 x 165 feet, with walls 45 feet high, and contains an engine-room and boiler-room. In the middle of the engine-room is the pump pit, 53 feet inside diameter, with its floor 58 feet below the surface. As originally constructed the three 30-inch intake pipes were about 48 feet below the surface, being laid in a deep trench.

A break in the intake pipes occurred in December, 1903, at a point just outside the pumping station. The resulting flow of the sand and consequent settlement of the ground endangered the west end of the building, and after unsuccessful attempts to reach and repair the break it became necessary to shut down the pumping plant. A temporary water-supply was furnished by pumps installed on the bank of the river, while a new intake connection was made, entering the pump pit about 20 feet above the floor of the pit. This intake was in use until 1906, when permanent repairs were commenced. The old trench was opened, and the pipes were removed. Piles were driven in the bottom of the trench and covered with a timber grillage embedded in concrete. Upon this the three 30-inch intake pipes were relaid. The lower part of the trench was sheeted, and the upper part was sloped. The trench was then refilled to the surface. The three 20-inch pipes which pass through holes in the centre of the conrete girder are connected to the intake pipes inside the pump pit, and are for the purpose of flushing out these latter pipes.

Shortly after the accident occurred, the end wall of the building was down, and a temporary timber wall built about 10 feet inside the building. Heavy inclined posts extended from footings at the base of this wall to support the overhanging ends of the roof trusses. This construction was continued in use until the reconstruction of the wall was taken up.

The cutting edge of the pump-pit caisson rests on a bed of gravel about 72 feet below the surface (22 feet below low water line). Above this is a bed of fine sand 18 to 20 feet thick, covered with a bed of silt or river deposit 24 to 27 feet thick and containing three layers of decayed vegetable matter 4 to 5 inches thick. The silt formed the original ground surface, but was covered with an earth fill 27 to 28 feet thick, which was placed in 4-inch layers and well rolled with a 16-ton roller. This material is quite compact and carries the foundations of the building and of the smokestack. The heavy pumping machinery, however, rests on the wall of the pump pit, and this has shown no settlement..

The building has settled considerably, from 3½ inches at the northeast corner to 11½ inches at the southwest corner, but the walls have not been injured, owing (it is thought) to the steel bands embedded in the brickwork. The settlement is considered to be due to the compacting of the silt and the layers of vegetable matter, rather than to the compacting of the filled material on the surface. The settlement occurred within a short time after the construction of the building, and no further movement has been noted. It was considered, therefore, that the surface fill, where not disturbed by the trench for the repairs to the intake, would form a good foundation for the repairs to the buildings. In view of the running sand it was thought inadvisable to seek a deep foundation.

The plan suggested, and now executed, was to build a heavy reinforced concrete girder under the end of the building; its ends rest on large footings in the solid fill, and it has a clear span of 55 feet over the unstable material with which the trench for the intake pipe was filled. The footings are so designed as to limit the bearing pressure upon the soil to about 1,600 lbs. per square foot.

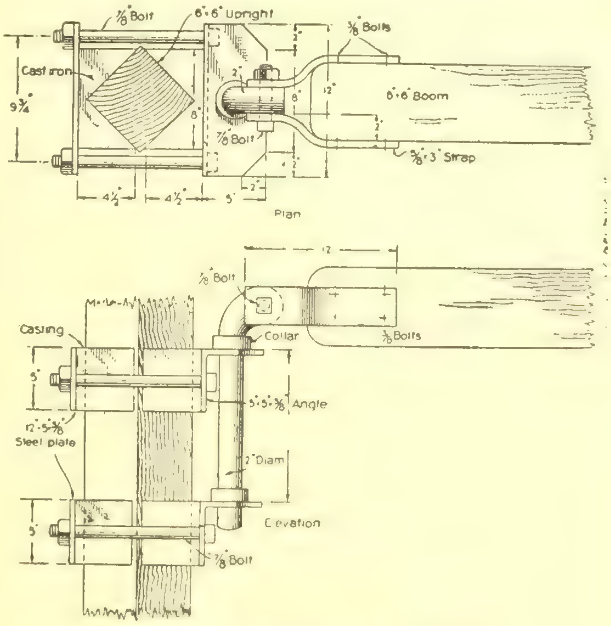
The girder is 95 feet 6 inches long, or 105 feet over the footings, with a clear span of 55 feet between the footings. It has a uniform thickness of 3 feet 6 inches, with a depth of 14 feet 6 inches in the main portion and increasing to 19 feet over the deepest part of the footings. Each footing is 20 feet 6 inches by 25 feet, and has a knee brace against the outside of the girder. On the inner side of the girder, at each end, is a return wall supporting the end of the side wall of the buiding. Two concrete struts 12 by 16 inches extend from the top of the girder to the wall of the pump pit.

The concrete used was a 1 : 2 : 4 mixture, made with broken stone ranging in size from 2-inch downward. The size of the girder is so great, and the reinforcing bars are so large, that there was plenty of opportunity for the concrete to thoroughly surround all parts of the reinforcement, consisting of cold-twisted steel bars, mainly 1 and 1¼ inches square, and steel stirrups. The form was built on the ground. It was left in place 30 days after completion and during this time was kept continuously moist. The construction of the girder occupied 20 days. The concrete was deposited uniformly over its full length in layers 12 inches thick, and on finishing work each day the surface was left as rough as possible. Before depositing concrete the next morning the surface was covered with a thick grout of cement and sand, 1 to 1. Then the first layer was deposited and well tamped.

The old brick wall was 30 inches thick for its full height of 45 feet, and was ornamented with heavy stone trimmings and cornice, the weight above water table being about 6½ tons per linear foot, or 620 tons for the west wall. This construction was unnecessarily heavy. The new wall is 12 inches thick with 30-inch pilasters to carry the roof trusses, and with large window openings to further reduce the weight. The stone cornice was replaced with one of galvanized iron to match the other sides of the building. Altogether the weight of the wall was reduced to 3½ tons per foot. The weight of the girder is also 3½ tons per foot, making the total load supported 7 tons per foot. The cost of the work on girder and wall was $16,270.

A Novel Boom-Seat for Hoisting Derrick

In the execution of building contracts novel expedients are often devised with a view to facilitating the performance of some detail of the work, or some peculiar form of construction is adopted in connection with the apparatus which is likely to command the immediate attention of the contractor or builder who may see it. In connection with the recent erection of a reinforced concrete building a rather novel fastening of the boom to the upright of a derrick was adopted by the concern executing the contract for the work. The boom seat was attached to a construction elevator tower, the elevator being used for hoisting concrete and the derrick for raising reinforcing steel and forms to the various floors of the building. The seat consisted of two pairs of castings 8 inches wide by 5 inches deep by 4½ inches thick cast to fit a 6 x 6-inch timber diagonally. Each pair of these castings was tightly clamped to an upright of the elevator tower by two ⅞ x 11-inch bolts, a 12 x 5 x ⅜-inch steel plate and a 5 x 5 x ⅜-inch angle 12 inches long. The two pairs of castings were spaced so that there was a distance of 12 inches from top to top of the outward flanges of the angles. In the horizontal flanges were holes through which passed a 2-inch steel pin, held in place by a collar resting on each angle. The head of the pin was bent slightly out from the upright, upset and drilled for a ⅞-inch bolt. This bolt held a ⅝ x 3-inch strap to either side of the head of the 2-inch pin, and the 6 x 6-inch boom was tightly bolted to these straps by four ⅜-inch bolts.



Boom-Seat for Hoisting Derrick

The derrick boom seat here illustrated and described was designed and used by the Aberthaw Construction Company, Boston, Mass., in connection with the erection of the building in question.

Messrs. Witchall & Son, who have the contract for building the new addition to the Telegram building at Toronto, have introduced a somewhat novel feature to the city in connection with excavating. The space to be excavated is 40 x 95, and the depth about 20 feet. The ground is first ploughed by steam. An ordinary plow is attached to a steel cable and the earth after being ripped up by the plow is loaded into wagons hauled up to the level of the street by a 10 horse-power engine.

Modern Methods of Treating Road Surfaces

Some Instructive Costs Together with Practical Directions for Obtaining the Most Satisfactory Results — Merits of Various Preparations

In the first place, a road should be prepared and rolled so that it is perfectly smooth before any finishing coat is applied. I am sure you have felt in riding over some roads that the surface resembled the waves of the ocean. This is caused by loads of material being dumped at different points, top leveled off, leaving the centre of the load undisturbed and more compact by being dumped. As the surface material is so much softer, when the road is first leveled and raked these depressions do not appear, but the hard core in the centre of each load will remain there and grow more and more exaggerated by the action of the traffic. The wheels going over the hard place and striking the soft will leave the road very uneven. Every load of gravel or stone placed upon the surface of the street should be dumped upon a platform or every shovelful should be so handled that it will be evenly spread. In this way it is possible to get a smooth, even surface. A good quality of gravel spread upon the surface of the road and thoroughly rolled and wet and covered with a preparation of some of the heavy asphalt oils or the lighter tar preparations will make a road almost free from dust and cheap to maintain. This method will appeal particularly to the towns where the appropriations are small and the mileage great.

Experience of Newton, Mass.

Newton, Mass., has about 37,000 inhabitants, with 9 miles of telford, 82 miles of macadam and 115 miles of gravel road. You can see by this that a large percentage of our streets is macadam; they were built on a good gravel foundation with the average city. Our city has experimented several years with different preparations, and I think it would be hardly fair to say that any one surface preparation on the market is superior to any other, for our choice must be governed by the conditions of traffic.

In the first place, if you have a good gravel road, properly crowned, it must be surfaced with a material suited to the kind of traffic it carries. The best way to decide this is by actually counting for 24 hours two or three times during the season the number of motor-driven and horse-drawn vehicles passing over the road. If the majority are horse-drawn, a preparation of heavy asphalt oil covered with sand or fine stone screenings and spread on the surface of the road will be the best to keep down the dust. It will not be slippery during rainy or frosty weather and gives a good footing for horses.

If, on the other hand, preparations are to be used for motor-driven vehicles, the several heavier asphalt oils and different preparations of tar can be used to good advantage.

If you treat a macadam road with tar or any of the heavier asphalt oils costing 7, 10, 12 or 15 cents per square yard a great saving is made in two years, for you save the surface of your road as well as get rid of the dust.

In 1907 we treated a section of a road where the old macadam surface had became badly worn. It was spiked up and covered with a light grouting of Portland cement mortar mixed in the following quantities: Two parts sand, one part cement. This was spread evenly over the entire surface; it penetrated the sand in such a way as to bind the whole material together, and was then smoothed off with street sweepers' large brooms. The road was closed for about four days, giving the cement time to set. After that it was opened to traffic and was used for about one year. The surface was then swept with an ordinary horse street sweeper and covered with a thin coating of Tarvia A, which was heated to a temperature of 80 degrees. We used about ¾ gallon Tarvia to the square yard. It adhered readily to the cement and has made a smooth and satisfactory surface for three years and remains to-day in first-class condition. On a small portion of this same street a second coating of cement grout was applied, covering it with Tarvia A, to see if the materials would adhere and make a satisfactory surface. The experiment was successful.

Some Instructive Costs.

In the spring of 1908 one of our principal streets was so badly out of shape that it required a new surface of about 3 inches of stone. This was put on an area of 6,290 square yards at the following cost:

Labor and teams	$1,250.08
Crushed stone, 500 tons	610.55
Screen gravel	14.85
Use steam roller	210.00
Tarvia A, 10,890 gallons	816.75
Total cost	$2,902.23

Cost, 46 cents per square yard.

At about this same time another street having an area of 9,821 square yards was treated in like manner, except that it was thought best to give it a much thinner coating of stone. This street was spiked up with the roller, and the crushed stone and Tarvia rolled on the surface in the same manner as described previously:

Labor and teams	$1,085.88
Crushed stone, 546 tons	557.90
Use steam roller	362.50
Tarvia A-10, 767 gallons	807.52
Total cost	$2,813.80

Cost, 28½ cents per square yard.

A third roadway, measuring 39,205 square yards and used exclusively for automobiles, was rebuilt at the following cost:

Labor and teams	$3,298.47
Crushed stone, 521 tons	522.90
Screened gravel	38.30
Use steam roller	571.25
Tarvia A, 31,424 gallons	2,356.79
Total cost	$6,787.71

Cost, 17 cents per square yard.

After this treatment had been applied an experiment was made by taking a small quantity of Texas asphalt, J brand, and heating it to a temperature of about 400 degrees, so that it would run freely through the sprinkler of a watering pot. Less than ¼ gallon to the square yard was used at an additional expense of about 2¾ cents a square yard. The surface has not only been less slippery than the Tarvia road, but it stopped the tar from boiling out on the surface in hot weather, and is as smooth as when it was first applied. It seems to seal over the tar and hold it so tightly that it does not deteriorate with the action of the weather. Records have been taken which show that on an average from 1,500 to 2,000 autos pass over this road in 24 hours, and yet it has not been cut by the chains of the autos, and is in perfect condition to-day.

On another road this year we tried a preparation of 90 per cent. heavy Standard oil. This was heated to a temperature sufficient to make it flow freely through the sprinkler of the oil distributor and put on to the surface of an old macadam road. The road was first spiked up and then covered with 2 inches of screened stone taken from an ordinary gravel pit, and varying in size from 2 inches down to ½ inch. The small stones filled in the spaces between the larger ones. The whole was rolled smooth and hard, then the oil was applied hot and it readily penetrated the entire mass, taking about 1½ gallons per square yard. This was covered with a coating of screened gravel, which had passed through a ½-inch screen and was thoroughly rolled with a steam roller and opened to traffic within 12 hours after it was completed. I have no doubt that this is making a very satisfactory road for heavy teaming. It is dustless as well as perfectly hard and smooth at the present time.

Another road was treated exactly in the same manner, using asphaltoilene. Of the two, this road seems to be a little more elastic.

Mixing Process Not Always Necessary.

I merely speak of these preparations being applied in this way to show that the mixing process is not always necessary, as I believe the penetration treatments have given us as good results as any of the mixing preparations, and the application is cheaper.

Last year dustoline was tried on about 40,000 square yards of one of the main thoroughfares, and the cost was less than 3 cents per square yard for the season.

Tarvia B was used in one of the residential sections of the city, covering an area of 70,000 square yards, at a cost of 3¼ cents per square yard.

Several streets surfaced with macadam, having varying grades, up to a maximum of 9 per cent, all of them having both a heavy horse-drawn and automobile traffic, were selected for a trial of the liquid asphalt treatment.

A quantity of sand was heated to a temperature of about 200 degrees Fahr., then dumped in a pile and leveled. The liquid asphalt was poured over the hot sand in the proportion of 1 gallon liquid asphalt to 1 cubic foot of sand, and the whole mass turned with shovels or mixed in a concrete mixer. This work was done at the pit. The mixture was then carted to the street to be surfaced, and spread on the roadway to a depth of less than ¼-inch, being raked evenly with 14-tooth wooden lawn rakes. Rolling was not considered necessary, and the street was kept open for traffic at all times. This treatment cost about 3 cents per square yard. It also has the advantage of leveling up and building up the surface of the road, and each new application provides a new wearing surface. This work was done in the summer of 1909, and is in perfect condition to-day, without any further expense.

We have had very good results by using gravel from an ordinary gravel pit and running it through a ½-inch screen, putting in a little over ½ gallon of asphaltoilene to 1 cubic foot of gravel. It is better to heat the oil or the gravel before mixing unless applied in the summer time. If done at this season there is no need of heating. A large pile of material can be prepared and ready to use at very short notice. We found it best to apply this after a heavy rain, as all the depressions in the road will show little pools of water, and if these are filled with this mixture and the surface raked with a wooden rake it will become as smooth as it was when first built. We have found this patching process very satisfactory, as in many cases it saves the expense of resurfacing the entire street. After the patching is completed the street can be resurfaced with a coating of heavy asphalt or Tarvia, which will make a new surface at a comparatively small expense.

Use of Heavy Asphalt Oils.

This year we have used a large quantity of the heavy asphalt oils, Tarvia A and B, and also some of the heavier standard oils. All the preparations came to us in tank cars and were heated and unloaded in the following manner: The car was connected with a small steam boiler and was heated to a temperature of about 100 degrees Fahr. This allowed the material to flow through the hose at the bottom of the car after the car had been placed on a trestle about 10 feet above the level of the ground. This material was then run into a Studebaker tank wagon. It is a steel tank, holding about 550 gallons, and contains forty 2-inch perpendicular tubes which pass through the tank. Underneath this tank there are two large burners supplied with kerosene oil, which is forced in by pressure. This heats the oil to the desired temperature, and a thick, heavy asphalt oil can be melted and applied in this manner. There is a firebox that extends the whole length of the tank, which gives an even heat right through. The oil is applied through a sprayer or spreader, which is perforated, and the oil trickles down on to the surface of the road in very fine streams and covers the road thoroughly by going over it once. In my opinion this is a very desirable way of putting on any heavy asphalt oil, as the material can be readily heated and applied in large or small quantities by valves which regulate the flow. We have found this wagon very useful in our work this year and I believe will be one of the most useful appliances for its purpose. It can be regulated so that it will put on as small a quantity as 1-6 gallon to the square yard.

After the oil was applied the road was covered with a light coating of sand, which dried out very readily, and we were able to use the road within a very few hours after the application of the sand coating.

In applying the oil it is better to take half of the road at a time, leaving the other half open for traffic. This saves driving on to the oil by the teams spreading the sand and also the liability of teams getting spattered with the fresh oil. One of the roads treated this year covered an area of 19,194 square yards.

6,115 gallons asphaltoilene at 7[illegible] cents	$481 13
79½ cubic yards of sand	63 60
Labor and teams	163 25
Total	$707 98

The cost per square yard was 3⅔ cents. This price is as small as any of the work done this year, as it has cost as high as 5½ and 6 cents. But this difference in price is accounted for by the long distance that the material has to be hauled and the increased quantity used.

On another section we used Tarvia B. The area treated was 11,288.60 square yards [illegible].

Labor and teams	$[illegible]
Sand, [illegible] cubic yards	[illegible]
Roller	[illegible]
Tarvia, 10,067 gallons	[illegible]
Freight	[illegible]
Total	$[illegible]

Cost [illegible] cents per square yard.

Design Assumptions for Standard Practice

The basis for calculations relating to the strength of structures in accordance with the assumptions recommended by the Special Committee on Concrete of the American Society for Civil Engineers are in part as follows:

Calculations shall be made with reference to working stresses and safe load.

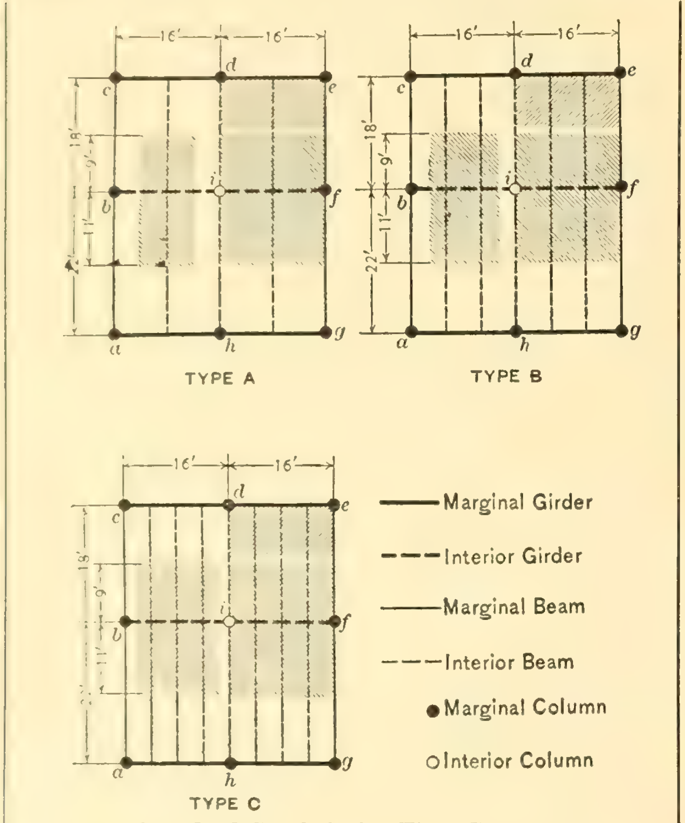
A plane section before bending remains plane after bending.

The distribution of compressive stresses in beams is rectilinear

Tensile stresses in concrete shall be neglected in calculating the moment of resistance of beams.

Perfect adhesion is assumed between concrete and reinforcement. Under compressive stresses the two materials are stressed in proportion to their moduli of elasticity.

The ratio of the modulus of elasticity of steel to the modulus of elasticity of concrete is taken at 15.



Standard Symbols for Floor Design.

Initial stress in the reinforcement due to the contraction or expansion in the concrete shall be neglected.

The above assumptions are quoted from the Blue Book of the Pittsburg Steel Products. The accompaning sketch shows standard symbols for floor design.

The cleaning of water mains by a machine invented by Mr. R. A. Adamson, engineer of the Rivington Works, is described in the engineering supplement of the "Times," London. An opening of 9 feet is made in the main to be cleaned and a bracket is fixed on each end of the opening. The brackets carry two rails and a screw of coarse pitch. A petrol engine is then lowered into the hole so that the wheels on the frame rest on the rails, while the screw passes through the centre of the machine. The shaft of the engine is then central with the main. The frame of the machine is fitted with a hand wheel, by turning which the machine is propelled along the rails in either direction by means of the screw. A specially constructed knife formed on a central bar carrying four cutters is used for the scraping, and is attached to the shaft of the machine. The engine having been started up, the driver turns the hand wheel in the desired direction of travel, the result being that the revolving knife is gradually fed into the pipe after the manner of a boring machine. The apparatus is such that in long lengths it is possible to clean 20 yards in each direction from the hole, or 400 yards in all. The speed of cleaning is about 50 yards an hour, or in ordinary practice an average of about 300 yeads a day. The appliance has been in actual operation at Huyton and one of the machines, it is stated, has been ordered by the Liverpool Corporation Water Committee.

A New Vacuum Street Cleaner*

In constructing this new vacuum street cleaner, it has been the purpose to so construct a machine that will gather all of the street refuse, heavy material as well as the fine dust, without sprinkling, thereby saving an enormous amount of money and doing away with an extensive equipment and making a thoroughly clean street without allowing any part to be afterwards exposed to view, so that no one may breathe the many injurious germs that are contained in this kind of dirt.

The machine is propelled by the same power that operates the fan and revolves the brushes, and in selecting these operating parts, the most simple known to automobile construction have been employed. We use the two-cylinder opposed 24 horse power motor, and the friction type of transmission, enabling us to have a great many changes of speed, and at the same time, making it impossible to strip any gear or break any parts, as it will act as a safety between the power and the driving wheels.

In moving forward, the brushes rotate so that the dirt is swept to the centre, where it is brought under the suction duct, and is lifted into the fan, and as the fan draws its air over the brushes, the dust that is raised is also drawn into the fan. After leaving the fan the separation is by gravitation. The heavier dirt comes out through the first outlet, the next heavy comes through the second outlet, and so on through the other two outlets that part of the dirt that is carried beyond this point is carried, by the air, into the retort, where it takes a downward spiral motion and is taken off at the bottom of the cone. Up to this point it is an easy matter to take care of the dirt, but there is a small quantity that does not want to leave the air or refuses to be separated, for it is as light as air itself; the quantity is small, not being over 1 per cent. of the total, but if allowed to escape, would make it very annoying, and has been the one stumbling block to this great means of sanitary cleaning. We, in our machine, effectively take care of this refuse by employing hydraulic means, but as the water is used over and over again its operation is so simple that it requires scarcely any attention.

This cleaner is one that will clean, with two men, as much street surface as several men could do with their present methods, and do it much better, without raising dust. It travels while working from two to six miles per hour, depending upon the amount of dirt upon the street, and can be governed by the operator at will.

The brushes are so made that they can be adjusted to clean the ordinary street in four laps.

At the first annual convention of the American Society of Engineering Contractors at St. Louis recently, a decision was practically arrived at as to the quantity of cement that a contractor should find in a barrel when he opens it. The standard adopted by the society was: Four cubic feet, weighing 56 pounds each, of loose cement.

---

*Paper by D. C. Smith, of Muncie, Ind., before the Indiana Engineering Society.

Purification of Public Water Supplies

Adaptability and Limitations of Hypochlorite Treatment—Amount of Chemical to be used—Precautions against Under and Over-Dosing*

The use of hypochlorites for sterilization purposes has now reached a stage where its field of usefulness in the destruction of objectionable bacterial life in public water supplies, filtered or unfiltered, is well understood. Until the fall of 1908, the data were scarce and more or less indefinite as regards practical application, but since that time enough history has been made to allow of the statement that a new epoch in the art of water purification has been ushered in; one which is revolutionary in character and which will always remain one of the most striking developments in the art of water purification.

Limitations of Filtration Processes.—When the first municipal filter was built at London, England, in 1829, the only office it was expected to perform was that of a mechanical strainer in removing turbidity from the water, for the germ theory of disease had not been advanced up to that time. It was not until 1849 that this theory assumed definite proportions during the severe cholera epidemic of that year. With the recognition of the germ theory of disease came the realization that polluted water, when passed through beds of sand, was made more safe for human consumption. This, however, was not widely recognized, as before stated, and in the late eighties the art of water filtration for municipalities was on a very insecure and uncertain footing. The striking results obtained at Altona, Germany, during the cholera epidemic at Hamburg in 1892, did more than anything else to convince the sanitary world and the public in general that filtration of polluted waters was deserved of the most serious consideration in connection with efforts to minimize the death rate from water-borne diseases. The splendid work of the Altona filters during the Hamburg cholera epidemic is too well known to require repetition here.

About the time of this epidemic the Massachusetts State Board of Health, as a result of the information accumulated during the early years of the work at Lawrence, arrived at the conclusion that the purification of waters as highly polluted with sewage as those of the Merrimac River could be successfully accomplished at a reasonable cost. Cholera appeared in New York harbor in the same year, probably emanating from Hamburg, and its appearance caused the city officials of Lawrence to decide upon the construction of a slow-sand filtration plant, thereby taking a step which was to prove to be the opening of an era of practical accomplishments in the field of water filtration in America. It must also be pointed out that sand filter plants were built at Poughkeepsie and Hudson, N. Y., as early as 1874.

It is probable that the most sanguine advocates of water filtration have never firmly believed that filtration of polluted water, even when carried out with the greatest care, will render it entirely free of bacteria at all times, or do more than greatly minimize the danger from drinking such water.

The hygienic efficiency of filter plants is usually stated on a basis of the percentage removal of bacterial life from the unfiltered water. Ordinarily such removal amounts to 90 per cent. and over, and it is clear that the danger in drinking polluted water is minimized in proportion to the removal of bacterial life. Filters will not remove all bacteria, and probably a fair statement of the safety of a filtered water for drinking purposes would be to say that, other things equal, it will to a considerable extent vary with the quality of the unfiltered water. In other words, a water which is primarily but slightly polluted, after filtration will be potentially less dangerous to public health than one which is initially foully impure.

Regardless of the initial impurity of a water, efforts have always been directed toward keeping as low as possible at all times the numbers of bacteria in the filtered water. In Germany the effort has been made to set and maintain a standard of purity for filtered waters of 100 bacteria per cubic centimeter, and when the filtered water contained a higher number than this the filter was to be judged inefficient and was to be shut down and cleaned. The results of the practical operation of large filtration works in this country and abroad show clearly that it is not possible at all times to live up to such a standard as this, and there will be times with practically all filters when the number of bacteria in the filtered water will amount to several hundred per cubic centimeter.

Filtration of impure waters has undoubtedly been instrumental in reducing by about 75 per cent. as an average proposition, the typhoid death rate in cities in this country using filtered water. It is by no means uncertain that there is also brought about by filtration a very material reduction in the death rate due to other diseases than typhoid fever, substantiating the theorem of Hazen.

By filtration water may be made at all times clear and free from turbidity and color, and substantially free from bacterial life. In the last two years the practical adaptability of hypochlorites in rendering filtered waters practically sterile, and, for that matter, unfiltered waters, has been clearly demonstrated. The hypochlorite treatment would therefore appear to be a finishing touch in the art of water purification, and to make available an exceedingly economical and harmless means of removing virtually the last fraction of potential danger from drinking water, whether initially impure or merely under suspicion at times.

The Chemical Nature of the Process.—Much has already been written about the chemistry of the process of hypochlorite treatment in the sterilization of water, but it may be that a condensed statement at this time and in this connection may not be out of place.

Hypochlorite of lime, commercially known as "chloride of lime," or "bleaching powder," has been and is extensively used for bleaching purposes in paper mills and many textile industries. It is sold in the form of a dry white powder, and is usually shipped in wooden or sheet-iron containers of a capacity ranging from 100 to 750 lbs. each. It is manufactured at numerous places in this country, as well as abroad, and its cost in large quantities is about 1⅓ cents per pound at the works. When exposed to air the powder deteriorates in strength quite rapidly, due to the absorption of moisture and carbonic acid. It is usually bought on the basis of its strength in so-called "available chlorine." The product in this country usually runs about 35 per cent. pure, according to this standard.

When the hypochlorite in the powder form is dissolved in water containing carbonic acid, hypochlorous acid is liberated. This acid is a powerful oxidizing agent and in the presence of organic matter gives up oxygen in an atomic state with an amount of energy which makes this chemical as an oxidizing and sterilizing agent approach ozone in intensity of action. It is generally considered to be superior to ozone on practical grounds, for the reason that it is more easily applied and brought in contact with all parts of the water to be treated in a speedy and thorough manner, which appears [illegible] possible in the case of ozone. There seems to be no doubt, also, that it always is materially cheaper than ozone.

---

*Extracted from a paper by George A. Johnson, New York, before the Milwaukee Convention of the American Public Health Association.

The chemical itself, as bought, is a mixed salt consisting of approximately equal amounts of calcium chloride and calcium hypochlorite. When the powder is added to water the calcium chloride remains inert, but the calcium hypochlorite, being acted upon by the free and half-bound carbonic acid in water, splits up into calcium carbonate and hypochlorous acid. The decomposition of the exceedingly unstable hypochlorous acid liberates oxygen in a very active state and leaves hypochloric acid. The latter then drives off the weaker carbonic acid and unites with the calcium, forming calcium chloride. It is the liberation of oxygen in this manner that effects by oxidation the destruction of bacterial life.

The general result following the application of hypochlorite of lime to water is the destruction of the majority of the non-spore-bearing forms of bacterial life, which the water may contain, a reduction in the organic color of the water, an oxidation of the organic matter proportional to the amount of the chemical applied, and a slight increase in the total hardness and total solid matter of the water. Where quantities no greater than from 5 to 15 lbs. of the powder are applied to each million gallons of water, as is the common practice, the changes in the physical and chemical characteristics of the water before and after treatment are so light as to be barely noticeable, and are well within the limits of accuracy of the prevailing methods of analysis. The important result and greatest change is the virtual destruction of the bacterial life in the water, more particularly the germs of disease-producing origin. Included in this group are the germs of Asiatic cholera and typhoid fever.

Hypochlorite of Soda.—There is another method of obtaining hypochlorites; namely, through the electrolysis of solutions of common table salt whereby hyochlorite of soda is produced. Careful study of the relative efficiency of hypochlorite of lime obtained from common table salt, shows that, unit for unit, hypochlorite of soda is slightly more efficient than hypochlorite of lime in the destruction of bacterial life. The process of manufacture of hypochlorite of soda is not so well understood from a chemical standpoint, however, but it appears certain that where electric current can be obtained for 1½ cents or less per kilowatt-hour, and salt for ⅓ cent per pound or less, it will prove to be a cheaper germicidal agent than hypochlorite of lime. Furthermore, its use, in some cases, may be preferable to hypochlorite of lime, because of the esthetic objections sometimes raised against the use of bleaching powder which, in the case of the electrolytic solution, should be entirely overcome. It is understood that at the water purification works of the City of Cincinnati, preparations are now being made to install electrolytic cells wherein hypochlorite of soda will be manufactured and substituted for the hypochlorite of lime used in the past.

Absence of Poisonous Features.—It has been asserted by some that free chlorine is liberated from the bleaching powder as applied to water, and that it may persist in water so treated for some time. In this connection it may be well to point out that the term "available chlorine" is a term of convenience used by the analyst to express the strength of the bleaching powder or the electrolytically prepared solution of hypochlorite of soda. The term was adopted by industrial chemists for the reason that in bleaching operations at some places the commercial product is treated with strong acids which can break up the chemical and release free chlorine. It is a perfectly clear proposition that if free chlorine could be released from bleaching powder when applied to water, such free chlorine would immediately combine with the hydrogen of the water and from hydrochloric acid, at the same time liberating free oxygen in an atomic state. The end result, therefore, would be the same.

There is plenty of evidence of a conclusive character to show that the weak carbonic acid as found in natural waters, is capable of releasing appreciable or even measurable quantities of free chlorine from bleaching powder. Instead of this hypochlorous acid is produced, and hypochlorous acid is not a poison. Upon its decomposition with organic matter, the chlorine which the hypochlorous acid contains combines with the alkalinity of the water and forms calcium chloride. No free chlorine within the limits of measurement of laboratory methods is found in the application of this chemical to an ordinary water supply. Efforts have been made in the past by those who did not favor the process to locate a toxicologist who would classify this treatment as a poisonous one, but such efforts have been unavailing.

Preparation of Hypochlorite Solutions.—It is the more common practice to make up hypochlorite solutions of ½ per cent. strength; that is, 1 lb. of the bleaching powder to 200 lbs. of water. It is probable that solutions as strong as 4 or 5 per cent. may be made without material loss of oxidizing power. But the more dilute the solutions are the more easy they are to work with, because of the deposits of quicklime formed in orifices and in pipes. At this place it is well to point out that where electrolytically produced solutions of hypochlorite of soda are used no trouble is had on account of deposits of sludge as in the case with hypochlorite of lime. This is another feature of no little importance in favor of the use of hypochlorite of soda.

As to material for solution tanks, concrete appears to be the most suitable. Iron tanks may be used, but they are attacked by the chemical and eaten through eventually, although they last a long time, owing to the protection afforded by deposits of lime upon the exposed surfaces. Black iron pipes have lasted for over two years at the Boonton plant, and special bronze pumps have lasted well at a number of places. Wooden tanks are the least suitable of all, but of these, cypress seems to be the best material. White pine is reduced to a pulp in a comparatively short space of time.

When the solutions of bleaching powder are used it is essential that the contents of the tank be thoroughly stirred in the beginning in order to get into solution all of the soluble portion of the powder. Afterwards stirring is of convenience in keeping the sludge well distributed, otherwise it gets bothersome as the last portion of the solution is removed from the tank. Tanks 10 or 12 feet deep, containing a ½ per cent. solution of bleaching powder or hypochlorite of lime will show a deposit of lime sludge about 1 inch thick. This sludge contains about as much of the active agent as the ½ per cent. solution does, and care should be taken in its disposal, otherwise it will cause trouble with fish.

Solutions deteriorate but little upon standing in covered tanks that are constantly stirred; perhaps some 2 per cent. in a day or two.

Quite recently considerable attention has been given to the feasibility of applying the bleaching powder in dry form. If appliances can be devised that will allow of the addition to water of a suitable quantity uniformly at all times and do it in a more or less automatic manner, there is no reason to suppose that hypochlorite applied in the form of powder will not act as satisfactorily as in the form of a solution, provided there are afforded adequate facilities for complete mixing of the dry powder with the water to which it is applied. Hypochlorite of lime absorbs moisture rapidly, and this is probably a point which will be most difficult to overcome where the application is in the dry form, as the powder will tend to lump and grow pasty with time.

Period of Contact.—All of the available data indicate clearly that the germicidal action of hypochlorites is exceedingly rapid. This is due, of course, to the fact that atomic oxygen is released promptly when the chemical is applied to the water.

As a general proposition it is thought advisable to provide for a period of contact of at least one hour before the treated water is delivered to the consumer. In some cases even shorter periods have given satisfactory results. Such periods of contact are naturally provided in some cases by long pipe lines or distributing reservoirs between the point of application of the hypochlorites and the nearest consumer. It is also highly important that the chemical be quickly and thoroughly mixed with the water and this is usually effected by mechanical stirrers or baffling arrangements.

Amount of Chemical to Be Used and Best Point of Application.—The best point of application of hypochlorite to a water depends largely upon the conditions surrounding each individual problem. As a general proposition, as before stated, from 5 to 15 lbs. of the powder per million gallons of water are required to effect practical sterilization of filtered or unfiltered waters which contain normal amounts of organic matter. If the water contains abnormal amounts of organic matter, or iron in an incompletely oxidized state, considerably larger quantities of the germicide are required to obtain the best results. Each individual problem must be studied by itself and the correct dose of the germicide ascertained in the beginning.

The earliest studies with hypochlorites were directed at the total elimination of bacterial life. This is not considered necessary in the sterilization of water. The principal object is to destroy all disease-producing germs, such as those of typhoid fever, if such germs are present. This can be done without effecting the complete destruction of all bacterial life in the water, for the reason that the typhoid bacillus, as well as the colon bacillus, is less hardy than most forms of bacterial life which naturally predominate in water, and which are known to be non-pathogenic. Their removal, therefore, is not a matter of consequence as regards the sanitary quality of the water.

It is known that hypochlorite has a selective action upon such germs as the bacillus of typhoid fever and coli, and owing to their less resistant state in water, destroys them more quickly and completely than it does some of the harmless forms of bacteria common to water. It is not unusual to find that such bacteria as resist the hypochlorite treatment are spore formers and other hardy forms of non-pathogenic water bacteria.

In gauging the amount of hypochlorite to be added to a given water, the water must first be carefully studied in connection with the germicidal treatment, and the quantity of the chemical which gives satisfactory results under normal conditions ascertained as nearly as possible. When this is found it is the quite common practice to increase this quantity some 25 or 50 per cent. in order to guard against sudden fluctuations in the quality of the untreated water which may increase its power of absorption of the hypochlorite. Where the germicide is added to a filtered water, such fluctuations are much less marked.

Precautions Against Under and Over-Dosing.—It can be readily understood that if too little of the germicide is used there may result an unwarranted feeling of security, for the reason that for months on end the results may be thoroughly satisfactory with a given quantity of chemical applied and then, owing to a sudden change in the character of the water, unsatisfactory results may be obtained. For this reason it is always better to use more of the chemical constantly than is actually required under normal conditions.

Overdosing, on the other hand, is quite as undesirable. If the attempt is made to effect complete sterilization of the water rather than to aim at the destruction of the pathogenic bacteria then there is a strong probability that at times there will be imparted to the water an undesirable taste or odor which has been variously termed by laymen as similar to carbolic acid or iodoform. It is not believed that within working limits the presence of an excess of this chemical in the water is deleterious to health, but it is objectionable to the senses and is, therefore, inadmissible. There is no excuse for such over-dosing, for when the quantity of chemical required under normal conditions is once ascertained, by making use of a moderate excess over and above this quantity a sufficient margin of safety has been provided under all ordinary conditions.

Advantages of the Process.—Reciting the practical status of the use of hypochlorites in connection with the purification of water, it may be stated that the advantages of the process are as follows:

1. Substantially complete destruction of objectionable bacteria, particularly those of intestinal origin.
2. Reliability and ease of application of the chemical, together with the small variation in the required dose.
3. Total absence of poisonous features, either in the chemical product as applied to the water or in any of its resulting decomposition products.
4. Merely nominal cost of the chemical and its application.
5. Speed of reaction, making unnecessary any substantial arrangements as to basins other than storage facilities.
6. Substantial saving in the cost of coagulation of waters that are sufficiently unsatisfactory appearance to require classification or filtration.
7. Permitting rates of filtration materially in excess of those possible where high bacterial efficiency is required of the filtration process in the absence of sterilization.
8. Reduced clogging of the filter beds with a consequent lengthening of the runs between cleanings, due to the destruction of various forms of algæ.

Limitations of the Process.—In making a complete analysis of the practicability of this process it is necessary to recognize the fact that it is not possible by the use of this germicide to accomplish certain features looked for in connection with certain styles of water treatment, as follows:

1. Inability to remove or destroy all of the spore-forming bacteria, but which kinds of bacteria are not considered to be pathogenic to man; at least those common to water.
2. Inability to remove bacteria which are embedded in particles of suspended matter.
3. Inability to remove turbidity.
4. Inability to remove appreciable amounts of color or dissolved vegetable stain.
5. Inability to remove organic matter appreciably.
6. Inability to remove swampy tastes or odors.
7. Inability to remove creosote tastes or odors coming from the cleaning of stills used in the destructive distillation of wood.
8. Inability to soften water; as a matter of fact, the addition of hypochlorite in the hardness of the water, although this is not ordinarily measurable, notwithstanding the fact that the commercial product usually contains a little free quicklime which reduces slightly the carbonic acid in the water.
9. Difficulties encountered in applying this process except with the greatest care to waters which contain substantial quantities of reducing agents or compounds capable of oxidation, such as nitrites and unoxidized iron.

The above statements set forth the advantages and shortcomings of this process which, like other things that are new, is likely to be, and is, in some cases, considered a cure-all for all water ills, and, no doubt, with disappointing results in some cases.

The application of hypochlorite to a water, while comparatively simple, should always be carried out with much care and fidelity by a competent analyst; otherwise, if the dose is not adjusted so as to meet satisfactorily all local conditions there is liable to be alternately an underdose of the chemical insufficient to sterilize or an overdose which will result in objectionable tastes and odors readily noticeable to the consumers, and due to the bleach itself.

The use of hypochlorites cannot be considered in the light of a substitute for filtration. Where [illegible] [illegible] and unsatisfactory in appearance but open to [illegible] their content in bacteria, the use of the hypochlorite process alone may, in many cases, prove insufficient. Where waters are unsatisfactory in physical appearance and are also polluted and require filtration, the combined process is called for. As an adjunct to filtration processes it has a distinct field of applicability, as above stated, for at a moderate cost it is feasible to obtain a water which is practically above suspicion; and furthermore, there is brought about a substantial economy in the first cost of the filtration plant. This is made possible by the use of higher rates of filtration than are ordinarily used, and the required filter area may, therefore, be reduced. It also effects a substantial economy in the cost of operation.

Vancouver and Coast Correspondence

Importance of Organization urged upon Master Builders by E. T. Nesbitt, of Quebec Rapid Developments at Port Mann, B.C.—General Notes

Office of the "Contract Record."
Vancouver, October 20, 1910.

"There are laws on the statute book of Canada that should never have been placed there," declared Mr. E. T. Nesbitt, president of the Canadian National Association of Builders' and also of the Quebec branch of that body. The statement was one of a number of trenchant expressions delivered on the occasion of a visit to Vancouver on Oct. 8th, when Mr. Nesbitt addressed a gathering of Vancouver master builders on matters pertisent to their business. Mr. Nesbitt has been making a tour of the West accompanied by Mr. J. H. Lauer, of Montreal. Meetings addressed at Winnipeg, Regina and Edmonton, were reported in previous issues of the Contract Record. The importance of organization was emphasized, it being pointed out that the holding of the annual convention at Winnipeg next year would offer a grand opportunity for the western Exchanges to get into close touch with those of Eastern Canada, in reference to legislation and other matters affecting their common interests.

Address Before Vancouver Exchange.

Mr. Nesbitt urged his hearers to organize, and become affiliated with the National Association so that they would be in a position to protect themselves against detrimental legislation that might be introduced into Parliament. The labor associations had accomplished much for themselves and had been successful in getting laws placed on the statute books that should never have been placed there, laws that would never been passed had the builders been properly organized and taken steps necessary for their own protection. He and Mr. Lauer had personally fought the eight hour law when it was introduced at Ottawa, and they had been successful in getting it shelved until next year. The Association had also been successful in getting a Workmen's Compensation Act in Quebec Province greatly modified. Very little permanent work could be accomplished unless the builders were united. The power of the Canadian Manufacturers' Association should be a patent object lesson. There was no good reason why the builders of Canada should not become equally as powerful for their own protection and the furtherance of their objects. Mr. Nesbitt instanced how the Canadian Manufacturers' Association kept a representative for the special purpose of keeping them posted upon everything that was introduced into Parliament tending to affect their interests prejudicially, the timely notice enabling them to frame up an effective opposition. He thought the Builders' Exchanges should adopt similar measures. He did not blame the labor organizations for looking after their interests, but he did wish to impress upon the builders that such harmful legislation as had been allowed to become law might have been avoided if Builders' Exchanges had been formed at all principal points and affiliation sought with the National Association.

President Nesbitt, while in Vancouver, was the guest of relatives and saw a good deal of the city. He was greatly impressed with the great progress on every hand.

Port Mann, C. N. R. Terminal on the Fraser.

Port Mann, opposite New Westminster, where the Canadian Northern Railway will establish its main Pacific Coast terminal, seems destined to become a city without having to pass through the slow degrees of growth peculiar to ordinary centres of trade and commerce. The townsite comprises two thousand acres above the big railway bridge, having two miles of water frontage. According to official advices, the plans of the railway management include provision for the needs of the system following the completion of the Panama Canal, the development of inter-provincial trade and the expansion of commerce between the Dominion and Australia, Central and South America and the Orient. The business and residential section of the new city will be built on a sloping hillside, extending southward in a series of terraces. Along the two-mile water front sites will be reserved for wharves, grain elevators, freight sheds and factories of various kinds. The machine and car shops, which will be immense structures, will be located adjacent to the yards, the laying out of which is now being carried on by Mr. W. G. Swan, divisional engineer, who is directing the construction of the initial wharf, 1,000 feet in length, which will be located about a mile and a half above the railway bridge. Surveyors are now at work subdividing the big area into lots.

Official Inspection Made.

Port Mann occupied the close attention of Mr. William Mackenzie, president of the Canadian Northern, upon his recent visit. The various points of interest were shown him by M. T. C. Holt, executive agent for Messrs. Mackenzie, Mann & Co., in British Columbia, and Mr. A. D. MacRae, a business associate and general manager of the Canadian Western lumber Company, of Fraser Mills. Mr. Mackenzie seemed to enjoy the outing. They left the automobile, and after examining the waterfrontage and the site of the proposed car shops and machine shops, climbed up the wooded terraces in the southern portion of the townsite. As a result of the visit Mr. Mackenzie will finally decide upon the details of the survey and the extent of the railway terminals. Subsequently the party boarded a launch, viewed the townsite from the river, examined the site of the proposed wharves, and then crossed over to Fraser Mills, where the huge mills of the Canadian Western Lumber Company are located. Mr. Mackenzie is a large shareholder in the latter enterprise, and took a keen interest in watching the transformation of saw logs into lumber.

Vancouver Island Activities.

Several days were devoted by Mr. Mackenzie to an inspection of the Vancouver Island coal mines, which he purchased several months ago from Mr. James Dunsmuir for $11,000,000. On the tour he was accompanied by Mr. A. D. McRae, managing director of the new Canadian Collieries (Dunsmuir) Ltd., and Mr. W. L. Coulson, manager of the mining department. The Extension and Comox fields were visited. Mr. Mackenzie after an examination of the mines, discussed with his fellow-directors details of the programme involving the expenditure in the next three years of $3,000,000 in opening up two new coal mines at Extension, and an equal number at Cumberland, as well as increased development of the present producing collieries. In both districts the equipment will be renewed, and steel tipples will be built at the new mines about to be developed. Mechanical haulage will also be installed. A 50,000 horse power plant in the Comox field will also be developed in order to supply power for operating the mines and operating the railway, which, like the line from Ladysmith to Extension, will be rebuilt and laid with 86-pound rails instead of the 56-pound rails now in use. The management expect that the coal output will be increased to about 10,000 tons daily before the end of three years, and the coal bunkers at Ladysmith and Union Bay will be enlarged proportionately.

The new Cambrie Street bridge across False Creek will be a massive and imposing structure. The three caissons for the draw-span were completed last week, these being 35 feet below the bed of the Creek. Twenty of the twenty-four concrete piers have also been finished, and the erection of the ironwork will be commenced in the near future. The bridge will be about 1,000 feet longer than the Granville Street structure, and unlike the latter, the north and south approaches will have concrete retaining walls filled in between with earth. The roadway will be 44 feet in width, or two feet wider than Granville Street bridge, with six-foot walks on either side. The level of the bridge above high tide will be 41½ feet at the draw. The original estimate of the cost of the new bridge was $770,000, but this is likely to be exceeded.

A large limestone deposit on the Chilliwack river has been secured by representatives of an English syndicate, the object being the establishment of a large cement works. The quarry is adjacent to the New Westminster-Chilliwack line of the British Columbia Electric Railway recently opened.

A Lobnitz rock-crushing vessel being built in Scotland for use in Victoria harbor is to be completed in November, and will be shipped on one of the Blue Funnel liners in knock-down shape. The strange craft is operated similarly to a stamp mill, a 20-ton hammer being dropped at the rate of ten times a minute by steam, pulverizing the rock. The removal of reefs and other obstructions in the harbor will occupy about two years unless the work is arranged in two shifts.

Building Inspector Jarrett, of Vancouver, is now predicting that the permits for 1910 will foot up to a round total of $12,000,000, or an average of $1,000,000 per month. Winnipeg's total for nine months has topped the $13,000,000 mark, but for the next five months Jack Frost will be the only builder at work in the prairie metropolis, while in Vancouver an army of masons, carpenters, lathers and plasterers will be steadily engaged all winter adding to the city's building total. If the present rate of progress continues—and all signs point that way—the disparity between the building figures for the two cities is an inspiring one: 1902, 417 permits, value $833,607; 1903, 580 permits, $1,426,148; 1904, 836 permits, $1,968,891; 1905, 910 permits, $2,653,000; 1906, 1,006 permits, $4,308,410; 1907, 1,773 permits, $5,632,744; 1908, 1,697 permits, $5,950,883; 1909, 2,054 permits, $7,258,565; 1910, first eight months, $8,270,645. Watch us grow!

City Engineer Clement of Vancouver has been criticised rather harshly by Mayor Taylor, and a section of the city council in connection with what is termed the fad of bench-grading of streets, as carried out in Seattle and other Sound cities. Certainly the cutting down of a number of streets, and raising the levels of others, has led up to a "messy" condition, but this has nothing to do with the merits of the case. The fact that the work was not undertaken sufficiently early to escape wet weather should not be permitted to "swamp" the facts. Bench-grading is either right or wrong—if the former, Vancouver wants the best system going; if wrong, then the Board of Works is culpable in having allowed the engineer to expend thousands of dollars of the people's money on a Yankee fad.

As a result of the severe weather in northern waters last winter, a number of the acetylene gas beacons were put out of commission for a time, owing to the freezing of water in the buoys. A possible recurrence of the trouble will be avoided by enclosing all buoys in portable houses, a number of which have just been sent north by the Government.

Messrs. Waddell & Harrington, consulting bridge engineers, of New York and San Francisco, will probably be appointed by Vancouver City council to act in a similar capacity for a period of five years, on a percentage basis, 3½ per cent. on the total cost being suggested, the city to pay all expenses. It will be remembered that this firm superintended the construction of the Granville Street bridge. When engaged on work other than bridge work for the corporation it was suggested that the rate of remuneration be $50 per day in addition to travelling and other expenses.

New Westminster city council has decided to appoint a building inspector, and is now wrestling with a large number of applications for the position. It is probable that a re-assessment of the whole city will also be made with a view to adjusting present inequalities. This undertaking will carry with it a re-survey of the town plot, for which permission has already been secured from the Provincial Government. The cost will mount into the thousands.

The roads of Vancouver, B. C., are so bad that coal dealers of that city are thinking of raising the price fifty cents a ton on certain districts, notably Kitsalano, Fairview and Grandview, in many sections of which localities are streets on which delivery wagons sink axle deep in mud during the wet weather. We venture to think that the citizens will find it more economical in the long run to agitate for an extensive street improvement programme next season. A Fairview contractor states that he is now paying 75 cents a load above the normal price for delivery of building materials.

Progressive New Westminster Industry

New Westminster, B. C., has a number of enterprising concerns within its boundaries, but none more so than the Dominion Wood Pipe Company, Limited, who report the most prosperous season in their history. The capacity of their plant has been doubled and at the present time they have sufficient orders to carry them well into December. The probability is that operations will be prosecuted at this rate right through the winter. The Dominion Wood Pipe Company, Limited, manufacture double wire wound and continuous stave wood pipe, also cast iron specials, valves, hydrants and waterworks supplies. They have only four competitors, and it is noteworthy that these are all located on the Pacific Coast. The Dominion Wood Pipe Company's products have earned a reputation for excellent material and high grade workmanship. The officers of the company are as follows: President, Mr. Jno. Schmehl; Vice-President, Mr. D. McKenzie; Managing Director, Mr. F. A. Shand; Secretary-Treasurer, Mr. W. H. Wilson.

A Winnipeg deputation waited upon the Hon. Robert Rogers, Minister of Public Works for Manitoba, last week and submitted the proposal of the Provincial Good Roads Association that the Government set aside a fund of [illegible] for highway improvements. The question will be submitted to the Cabinet at its next meeting.

All Trades Busy at Ottawa

Fall Business Stimulated by Award of a Number of Good Contracts—New Aqueduct Half Finished

Ottawa, Oct. 22, 1910.

A large number of contracts have been awarded lately in Ottawa for remodelling residences in the more expensive part of the city. These are large in the aggregate, and consequently all trades are very busy.

The plumbers have had a good summer and will be very busy all fall. The general extension of the sewer system in the outlying parts of the city, and the enforcement of the by-laws against open privy vaults wherever there is a sewer, has made the plumbing business very active indeed. This large amount of jobbing is increased by the many reconstructions of the plumbing systems in old residences. The master plumbers and the journeymen plumbers are working under a satisfactory agreement, and the supply of labor in this trade is about equal to the demand.

The electricians report a great many contracts on hand for the next few months. The inspector for the fire underwriters has been very active inspecting the wirings, particularly of the commercial buildings. In many cases this has influenced the owners to entirely renovate their systems or install new ones. The many business buildings now being constructed will also mean a number of big jobs in electric fitting. There is a slight scarcity of electricians, but not sufficient to affect the situation.

The construction of the new aqueduct by the city is about half completed. The total distance to be excavated is about 2,000 feet and about 1,000 feet is finished. However, all the difficult parts have been completed, such as crossing under a portion of the river, under the C. P. R. yards, and under the Massey Harris building, without any unsatisfactory results. From now the excavation will be along a street. The excavation in through rock, and is 30 feet deep and about 28 feet wide. The bottom of the duct is the same level throughout its course. The construction of concrete arches, which cover the duct is kept apace with the excavating so that a very small part of the traffic of the street is interrupted at one time. This work will be continued all winter.

The bottom of the river above the aqueduct will be lowered from five feet below the surface to 15 feet for the intake pipe. A dredge has been built especiall yfor this work. This work will be begun at once and will be continued all winter. This portion of the undertaking will cost about $80,000. The entire work is under the supervision of City Engineer Ker.

Winnipeg Making New Records

Western Metropolis Expects to Spend Fifteen Millions on New Buildings during 1910 — Trade Conditions

Winnipeg, Man., Oct. 21, 1910.

As far as important building work goes, 1910 has practically closed its records in Winnipeg. Building figures for actual building—subways and bridges excepted—stand at $13,500,000. Probably there will be enough money represented in house permits before the end of the year to bring the total to fifteen million dollars. Fall weather has arrived and builders and achitects are abandoning schemes to rush through any more big buildings this season. A number of excavations are being started preparatory to next year's activity, but at present there are just two structures upon which it is expected that work will really be commenced in earnest this year. The Canadian Bank of Commerce will start on the eight-storey structure which is to replace and extend the present offices on Main street, and which when completed will cost in the neighborhood of $700,000. Excavations have been made for the new home of the Sterling Bank, on Portage Avenue. It is stated that James Chisholm & Son, the architects for the latter building, have almost completed the plans and will call for tenders within a few weeks. This building will also be eight storeys in height and will cost approximately as much as the Bank of Commerce building.

With either one of those commenced, the city is certain of setting up new Canadian records, for there is no abatement in the stream of home-builders who are pouring daily into the offices of the Building Inspector for permits. To-day more than $50,000 was represented in eighteen permits issued, and for the week, house permits ran close to $200,000.

Now that the season is coming to an end, contractors and builders are commencing to look back over the progress. There is still a very large amount of work uncompleted, and a great deal of this is concrete work. There have been many delays during the season. Practically every possible cause has entered into these. At the commencement, men were none too plentiful. There was a heavy demand on Winnipeg workmen by the western towns, where big wages were offered. When the working forces were brought up to normal, the trades unions brought on the masons and bricklayers lockout, which set back building operations from two to three weeks.

All spring and summer, and up to the present time this fall, the steel companies have been none too expeditious in making deliveries. In some cases the delays were serious. The shortage of brick early in the year had its effect in a slight delay, for which no one was responsible. The stone yards have been entirely unable to cope with orders from contractors all over the city, and this has been one of the most serious drawbacks to the building trades this year. In cement construction there appears to have been no hold-up by men or material.

In apartment blocks and factories, as well as in several warehouses and business blocks, cement construction, faced with brick or terra cotta, or cement supports, has been employed very largely. The greater number of warehouses, however, are of the old style mill construction, while buildings built entirely of brick are remarkably few.

Personal News and Notes

The death occurred recently at Montreal, of Mr. Richard Lynch, assistant superintendent of the western division of the Civic Roads Department.

Up to September 30, 1910, the total value of buildings erected in Port Arthur exceeded that of the corresponding period of 1909, by nearly $210,000.

The Industrial Commission of Montreal have decided to hold an exhibition in that city in 1912. Tenders are now being called for a site of from 100 to 200 acres.

The works committee of the Toronto city council have decided to engage Mr. Rudolph Hering, New York, at a fee of $3,000 to report on the question of establishing garbage incinerators.

Mr. A. E. Hanna, secretary of the Dominion Wire Manufacturing Company, Montreal, is leaving shortly for Winnipeg, where he will assume the position of western sales manager of the Steel Company of Canada, Limited.

The death occurred at Seattle last week of Mr. J. Heney, well known railway contractor, who has carried out extensive work in British Columbia and Alaska. The late Mr. Heney built the White Pass & Yukon railroad system.

A deputation representing the Toronto Building Trades Council appeared before the Fire and Light Committee and asked for an amendment of the building by-law compelling contractors to provide the same proper protection for working-

Smokestacks

We can build them quick of the right quality and at the right price.

Boilers

Do you need a boiler? Let us quote you. We guarantee our Boilers and stand behind our guarantee.

Steel Tanks

We make all sizes and shapes for water, oil or anything else. We make them right and tight.

We have the facilities for manufacturing these goods quickly and in the best manner. We will be glad to quote.

Marsh & Henthorn, Limited
Belleville, Ont.

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

Specify in the Contract

"Metallic"
Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

SCANDINAVIA BELTING

For Conveying and Transmission

SCANDINAVIA M. C. M. BELT
SCANDINAVIA M. C. M. BELT
SCANDINAVIA M. C. M. BELT
SCANDINAVIA M. C. M. BELT

Whether your Belt Drive is **straight** or **crossed,** conditions **wet** or **dry,** of the air dust laden **Scandinavia Belt** will give you satisfaction.

We can save you money.

Write for Bulletin "A" and discounts.

Federal Engineering & Supplies, Limited
284 Yonge St.
TORONTO

AGENTS:
Power Economies Limited, Montreal
Marks-Clavet-Dobie Limited, Port Arthur
McDougall Hardware Co., Ottawa
Great West Saddlery Co., Calgary
Agents Wanted in other Cities

CONDUITS COMPANY LIMITED CONDUITS GALVADUCT LORICATED TORONTO, CANADA

"Galvaduct" and
"Loricated"
CONDUITS
For Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Paten
Toronto - Canada

The Consolidated Stone Company
Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

BEDFORD STONE

The Celebrated
Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.
Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

SAND and GRAVEL
A SPECIALTY

We have the above in various grades
ready for immediate delivery
Let us quote on your requirements.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North {664 665 Evenings, North 2107

men employed on steel frame structures as on brick and stone buildings. They were informed that the city architect was preparing a by-law to cover the situation, and that it would pass the City Council at an early date.

The death occurred recently at Victoria, B. C., of Mr. H. P. Bell, a pioneer civil engineer, who was identified with much important C.P.R. construction in British Columbia.

At Edmonton, Alta., last week, damage to the extent of $5,000 was caused by a cave-in which occurred on the excavation work for the high level bridge. The retaining walls were carried away, and derricks, boilers and concrete mixing machinery buried many feet deep.

Building permits issued at London, Ont., last month totalled $148,950, compared with $54,890 during September, 1909. Mr. Arthur E. Nutter, city architect, informs us that conditions are greatly improved in the Forest City, and that the outlook for the future is bright.

Building permits issued at Toronto from January 1st to September 30th, represented a total of $14,819,508, as compared with $13,064,877 for the corresponding period of 1909. The total for September of the present year, was $1,332,535, as against $1,046,065 for September, 1909.

The Edmonton police are looking for one, H. E. Davis, of Pittsburg, who, representing himself as an official of the American Industrial College, applied for a permit to erect an 8-storey building at a cost of $1,500,000 and afterwards endeavored to practice extensive frauds upon the strength of this application.

Mr. J. J. Flanagan, a well known municipal contractor, of Fort William, left that city last week for Dauphin, Man., where he has extensive contracts for the installation of sewer and waterworks systems, totalling $100,000. Operations will be commenced at once and will be completed, Mr. Flanagan hopes, well within the time limit of two years.

Mr. Chas. M. Hayes, president of the G. T. R. and G. T. P. railways, left Montreal last week for Quebec and St. John, N. B. Mr. Hayes will be a guest of honor at a banquet given by the Board of Trade in the latter city. It is expected that he will make an important announcement regarding the plans of the new transcontinental for their terminals at St. John.

It is stated that a company has been formed to develop the steel and coal resources of the Calgary district, which some people are optimistic enough to believe will become some day a great steel and iron manufacturing centre. Last week, Mr. A. E. Sjosfedt, the well known mineralogist of Sault Ste. Marie, conducted a series of laboratory tests on ore collected within 100 miles of Calgary. On two tests the results were 45 per cent. and 45.2 per cent. iron. Others made have run even higher.

A recent arrival at Montreal was Mr. Wilfrid Stokes, managing director of Messrs. Ransomes & Rapier, Limited, the well known constructing engineers of Ipswich, Eng. Among the many important works that have been carried out by this firm may be mentioned the sluices on the Manchester ship canal and the Assouan dam in Egypt. Mr. Stokes admitted that his attention had been directed to the possibilities of Canadian development, and stated that his firm would consider the establishment of a local branch.

Mr. F. M. Dean, sales manager of the Reo Motor Car Company, of Canada, Limited, St. Catharines, Ont., who is now in New Brunswick, states that the roads of that province, considering the population and general conditions, compare favorably with those of Ontario, Quebec, Ohio, Minnesota, and other parts with which he is familiar. Mr. Dean's testimony is substantiated by the fact that he covered a 97-mile run in about four and a half hours, a circumstance which speaks more for the highway conditions of the province than for its police supervision.

The Original

MARSH - PAUL AIR VALVE

Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture — also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our WINDOW GUARDS

Insist on having HARD STEEL WIRE

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

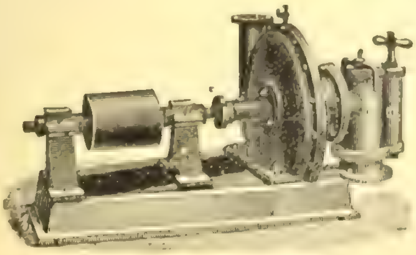
Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

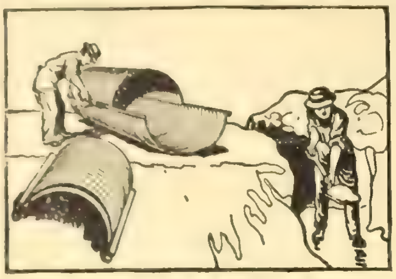
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



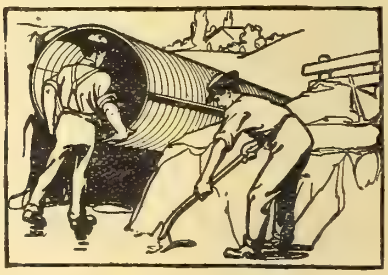
Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.



PEDLAR
NESTABLE GALVANIZED
CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivalled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 23 inform you on the economy and practical merit of the Pedlar Perfect Culvert. Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay-proof. **Investigate** and get prices. Address warehouse nearest you.

The PEDLAR PEOPLE of Oshawa

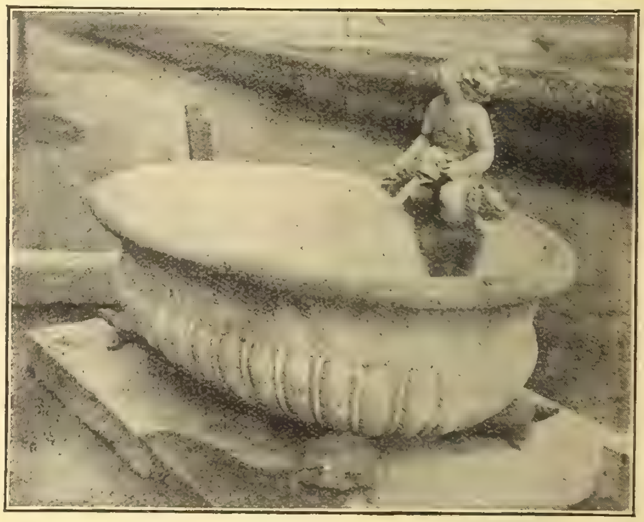
HALIFAX 16 Prince St.
CHATHAM 200 King St. W.
LONDON 85 King St.
QUEBEC 127 Rue du Pont
WINNIPEG 76 Lombard St.
REGINA 1901 Railway St. S
MONTREAL 321-3 Craig St.
CALGARY 1112 First St. W.
PORT ARTHUR 45 Cumberland St.
VICTORIA 434 Kingston St.
OTTAWA 423 Sussex St.
ST. JOHN, N.B. 42-46 Prince William St.
TORONTO 111-113 Bay St.
VANCOUVER 821 Powell St.

Granite Marble
Tiles Slates

Ceramics
Marble Mosaics
Marbleithic Tiles
Wall Tiles
Quarries

We carry a stock of above materials in Montreal and are prepared to supply the trade at lowest prices.

The Smith Marble & Construction Co.
Limited
The Calkins Tile & Mosaic Co.
Limited
458 Bleury Street, MONTREAL, QUE.



Handsome Ornamental Work
Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read **The Cement Era.** The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.
1800 Monadnock Block - - CHICAGO

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper, but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phones: Office 1217
Yard 4507

Sand & Supplies, Ltd.

TORONTO

Are You Interested in Good Brick?

Do you want to be known as a fellow who always uses the best? Then in future see that you specify

"Port Credit" Brick

It's strong, durable and has a rich red color that will please you beyond all expectations.

We are armed for Fall Orders

Port Credit Brick Co.
Limited

Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited

Phone 423 and 2457

HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

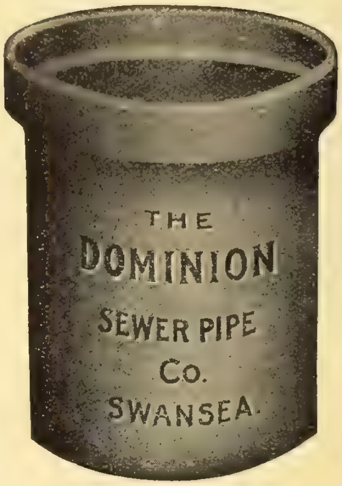
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and **New Glasgow, N.S.**

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.
General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed
Sewer Pipe
in the WORLD

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW,
President.

R. H. NEW,
Vice-President.

The Most Satisfactory Sewer Pipe that is being offered to Canadians

We aim "and our aims are realized" to make the best line of Vitrified Salt Glazed Sewer Pipe that is being offered to the Canadian trade. The consumers, contractors, corporations and dealers throughout Canada mostly prefer our product, quality being their first requirement. Then, too, we pay special attention to inquiries.

Prices, and last, but most important, "DELIVERY"

You simply cannot afford to buy elsewhere

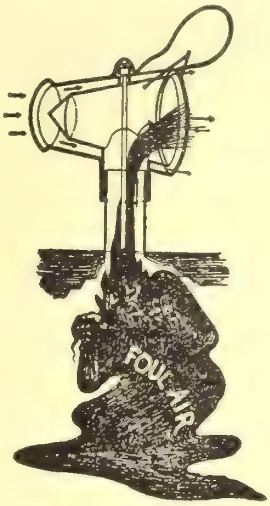
The

Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

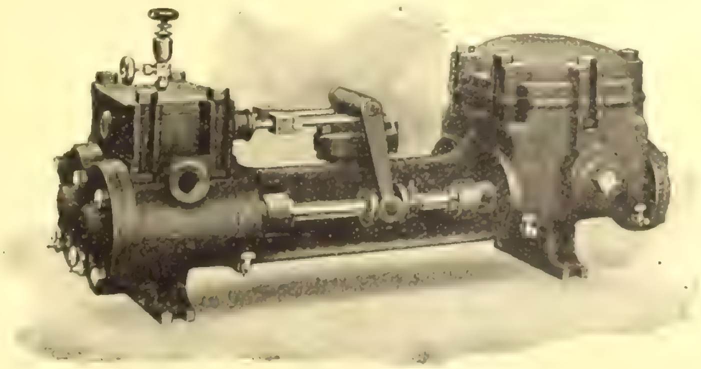
Gardiner & Gaskill, 505 Power Bldg.,
Montreal, Que.

Telephone Main 159

Duplex Steam Boiler Feed Pumps

In design and construction, our new Standard Duplex Pumps conform to the latest and most approved practice, and in addition include a number of special features of merit described in our Bulletin No. 36. :: ::

Full Stroke under all conditions.



Reliable in Service.

Compact in Design.

Canada Foundry Company, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

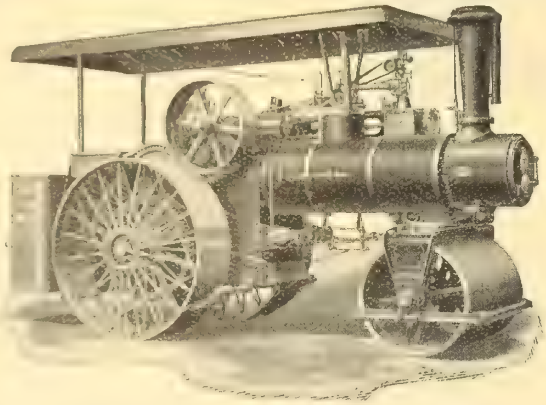
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis.. U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

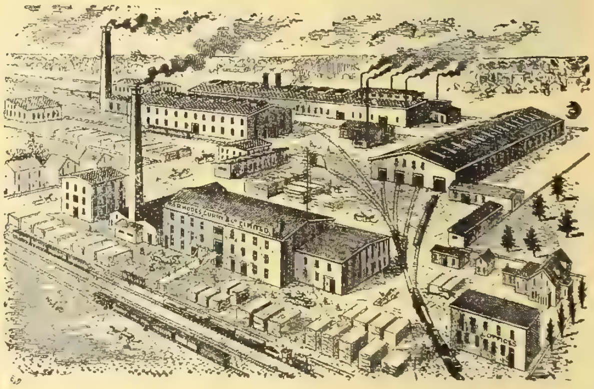
J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Rhodes, Curry Co., Limited
Lessees



Bank and Office Fittings

SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. **Amherst, N.S.**

BRANCHES AT
Halifax Sydney

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work
and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER
Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established 1882
THE COMMERCIAL
[illegible]
GENERAL TRADE NEWSPAPER of the GREAT WEST.
Winnipeg Manitoba

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridges' Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

---

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

VACUUM STEAM HEATING and DRYING SYSTEMS

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

		Star.	D.D.
10 to 25	united inches......	$4.25	$ 6.25
26 to 40	"	4.65	6.75
41 to 50	"	5.10	7.50
51 to 60	"	5.35	8.50
61 to 70	"	5.75	9.75
71 to 80	"	6.25	11.00
81 to 85	"	7.00	12.50
86 to 90	"	....	15.00
91 to 95	"	....	17.50
	Brass Goods, Valves, etc.		
96 to 100	"	....	20.50
101 to 105	"	....	24.00
106 to 110	"	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.......	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off caulking lead, 4½ cents per lb., traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

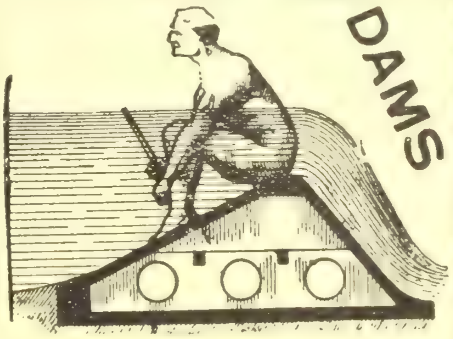
(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, $1.05 per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The B. C. Gazette gives notice of the incorporation of the following companies:—Empress Electrical Works, Ltd., capital $700,000; Vancouver Sewer Pipe and Refractories Company, Ltd., capital $250,000; Bridges Lumber Company, Ltd., $125,000; Electric Railways Construction Company, Ltd., capital $600,000; Canadian Mills & Timber, Ltd., $1,000,000; Lincoln Sawmills Company, $50,000.

A monorail line, 3 miles long, has recently been completed in The Bronx, New York City, and on the first regular trip, when loaded with 100 passengers, the supporting structures failed and the passengers were badly shaken. The car is 50 feet long, 6½ feet wide and seats 50 passengers. It runs on a single rail and is supported above by guide rails engaging wheels on top of the car. These rails also carry the 550-volt direct current for operating the car. The recent accident, it is stated, was due to hasty construction of the roadbed, since it was desired to open the line as soon as possible. The system, designed by Mr. H. H. Tunis, was used on a smaller scale at the Jamestown Exposition.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

The KATIE Foundry, Galt, Ont.
Contractors
Columns, Beam Rests, Beam Hangers, Iron Sills, Sashweights.
Municipal
Water Pipe, Service Boxes, Manhole Frames, Crossing Plates, Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concre

Alsen's Cement

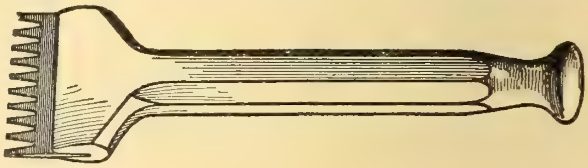
was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.



The "Simplex" Stone and Marble Cutter

This tool is furnished with adjustable blades for both freestone and marble, the blades being replaced when worn. The new blades are cheaper than sharpening the solid tools and save a lot of trouble. They give perfect satisfaction. We also supply double tooth cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

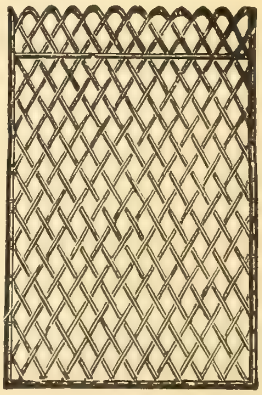
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

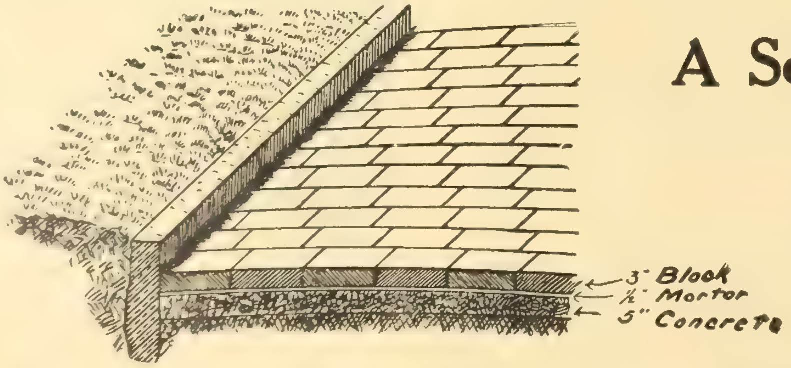
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co., Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

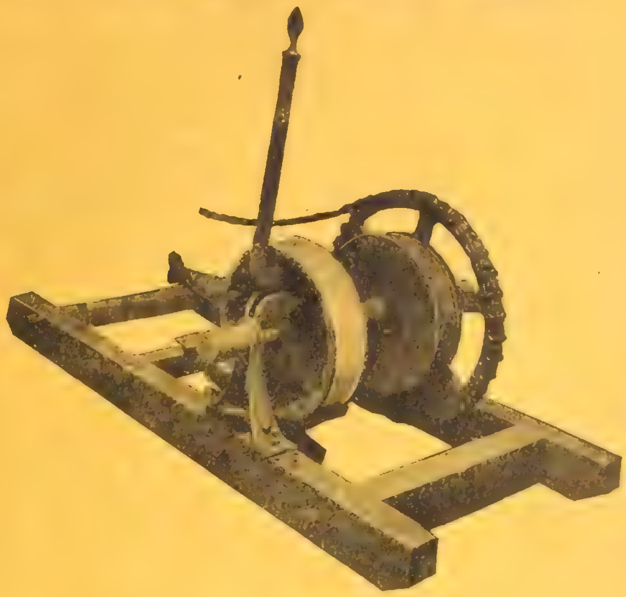
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

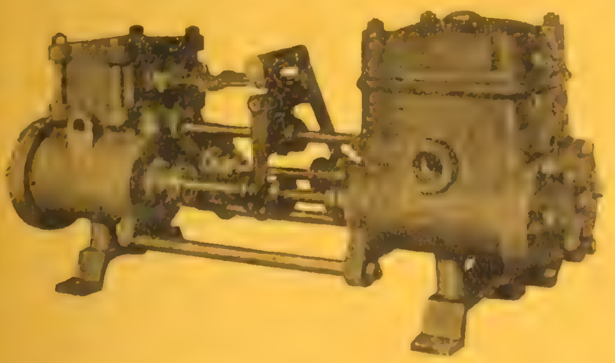
This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited

Engineers and Machinists London, Canada

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co. Limited

Toronto, Canada

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills Limited

Midland, Ontario

"Some Equipment With Merit"

FOR THE CONTRACTOR

"Kilbourne & Jacobs" Pressed Bowl Wheelscrapers

are the very best that can be purchased anywhere. They are the only perfect wheelscraper. The Best, strongest and easiest working Scraper ever put on the market.

We carry a full stock of all sizes for immediate shipment

"Columbus" Scraper

"K & J" DRAG SCRAPERS

In all sizes

"Boss" Scraper

Our scrapers are the leading drag scrapers everywhere. All our scrapers are absolutely seamless throughout and are superior to any others upon the market.

We want your inquiry when in the market—Prompt shipment from stock

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec Dunn Bros., Winnipeg Ritchie Contractors Supply Co., Vancouver

Vol. 24 Toronto, November 2, 1910 No. 44

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE

The **Smart-Turner Machine Company**
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

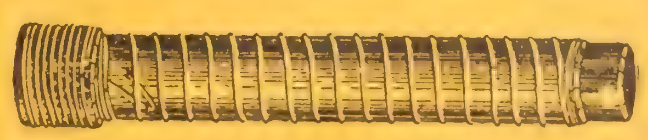
Imperial Type "E" Riveters Lead in Economy

because they have only **two** wearing parts each being made of high-grade material specially treated minimizing wear and maintaining their original high efficiency.

EFFICIENCY because they are simple, well designed and perfectly manufactured.

Type "E" Riveters are made as well as it is possible to make them with the best of material and skill and the finest equipment.

CANADIAN RAND CO., LIMITED
Commercial Union Building, MONTREAL, QUE.



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work

	Page
Canada Wire Goods Mfg. Co	54
Dennis Wire & Iron Works	16

Belting

Federal Engineering & Supplies, Ltd	53

Boilers

Inglis, John	24
Jenckes Machine Co	2
Leonard & Sons, E	55
Marsh & Henthorn	53
McDougall Caledonian Iron Works	31
Mussens Limited	32
Taylor-Forbes Co	23
Waterous Engine Works Co.	

Brick

American Enamelled Brick Co.	63
Canadian Pressed Brick Co	55
Don Valley Brick Works	7
Hamilton Pressed Brick Co	10
Milton Pressed Brick Co	
Port Credit Pressed Brick Co.	55
Toronto Pressed Brick Co.	

Bridges (Steel)

Canadian Bridge Co	18
Cleveland Bridge Co.	18
Dickson Bridge Works	
Dominion Bridge Co	18
Phoenix Bridge and Iron Works	19
Pennsylvania Steel Co.	18

Builders' Hardware

Taylor-Forbes Co.	23

Cement

Alsen Portland Cement Co.	62
Britnell & Co	51
Bremner, Alex	59
Canada Cement Co	3
McNally & Co., W.	55
Morrison & Co., T. A.	60
Rogers, Alfred	4
Rogers Supply Co.	31
Sand and Supplies	59

Conduits

	Page
Conduits Co., Limited	52

Concrete Mixers and Machinery

Canada Foundry Co	57
Cropp Concrete Machinery Co	6
Goold, Shapley & Muir	9
Hopkins & Co., F., H	64
Jenckes Machine Co	2
London Concrete Machinery Co	23
Mussens Limited	32
Morrison & Co., T. A	60
Rogers Supply Co	31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co.	61
Buffalo Steel Co	19
Canada Wire Goods Mfg. Co	54
Hamilton Iron & Steel Co	
Trussed Concrete Steel Co	5

Contractors' Plant

Beatty & Sons, M.	54
Factory Products Limited	
Hepburn, John T	17
H & E. Lifting Jack Co	
Hopkins & Co., F. H	64
Katie Foundry Co	61
Marsh & Henthorn	53
Meaford Wheelbarrow Co	51
Mussens Limited	32

Crushers (Stone and Rock)

Hopkins & Co., F. H.	64
Jenckes Machine Co	2
Mussens Limited	32
Morrison & Co., T. A	60

Corrugated Iron

Galt Art Metal Co	
Metallic Roofing Co	55
Metal Shingle and Siding Co.	20
Ormsby, A. B., Limited	5
Roofers Supply Co	59

Contractors

	Page
McIlwraith, Jas. A.	60

Drills

Beatty & Sons, M	54
Canadian Rand Co	1

Deafening Felts

Cabot, Samuel, Inc.	55

Drilling Contractors

Harvey, J.	61

Dredges

Beatty & Sons, M	54

Engines

Canadian Boving Co.	2
Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	59
Mussens Limited	32
Waterous Engine Works Co.	

Excavators

Harris, J. W.	11

Electrical Apparatus and Supplies

Factory Products Limited	
Northern Electric & Mfg. Co.	34

Engineers (Civil and Mechanical

Barber & Young	60
Chipman & Power	60
Bowman & Connor	60
Farmer, John T.	60
Fuce, Edw. O.	60
Galt Engineering Co., John	60
Glaubitz, H. J.	60
Hunt & Co., Robt. W.	55
Inglis, John	24
Kennedy, Jas. C.	60
Lea & Ferguson	60
Mace, T. Harry	60
Mitchell, C. H.	60
McRae, John B	60
Moore & Scollan	60
Nadel & Adler	60

Fire Apparatus

	Page
Factory Products Limited	
Morrison & Co., T. A	60
Seagrave, W. E.	16

Fireproof Doors and Windows

Douglas Bros	14
Mussens Limited	32
Ormsby, A. B.	5

Granite and Marble

Laurentian Granite Co	60
Missisquoi Marble Co	
Rogers Supply Co	31
Smith Marble & Construction Co.	

Glass

Chance Brothers & Co.	12
Consolidated Plate Glass Co.	
Luxfer Prism Co	2
Thompson & Co., B. & S. H	12
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co	2
Leorard & Sons, E.	55
Tavlor-Forbes Co	23

Hoisting Machinery

Beatty & Sons, M	54
Factory Products Limited	
Inglis, John	24
Jenckes Machine Co.	2
Hopkins & Co., F. H	64
London Gas Power Co	63
Marsh & Henthorn	53
Mussens Limited	32

Hydrants

Canada Iron Corporation	57
Gartshore-Thomson Pipe Co	56
Kerr Engine Co	

Lime

Christie, Henderson & Co.	17
Jamieson Lime Co	19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

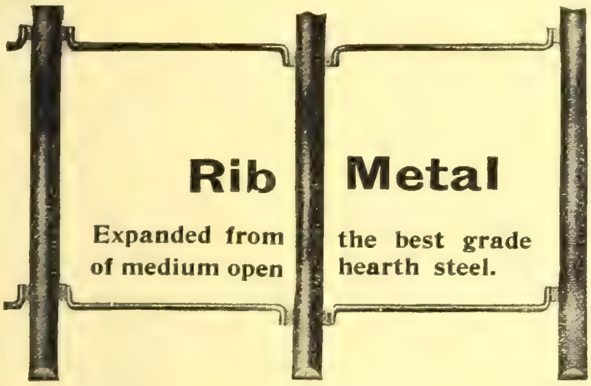
ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.

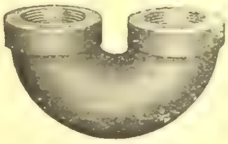

Rib Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

Semi Steel Fittings

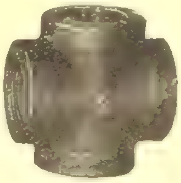

RETURN BEND

PIPEHANGES

Y BRANCH

REDUCER

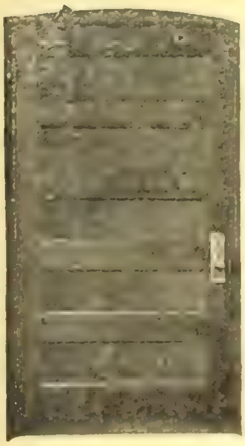
HEADER


CROSS

A fitting for every purpose
TRY THEM

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

WHY WE ARE GROWING!



Because we specialize in FIREPROOF WINDOWS, DOORS and SKYLIGHTS. Because we endeavor on every contract to give such complete satisfaction that our goods make friends of the architects and builders, and we are given the opportunity of quoting on his wants again. Again, when extras happen they are never taken advantage of. If this has the right ring, give us the opportunity of submitting figures. We feel it will be to our mutual benefit.

Experts in Fireproof Windows, Doors and Skylights.

A. B. ORMSBY, Limited

Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
[illegible]	16
[illegible] Ltd	23
[illegible] & Sons, J. R	[illegible]
Georgian Bay Shook Mills	[illegible]
[illegible] & Co	
[illegible] Co	62
[illegible] Bros	[illegible]
[illegible] Co	51
Woodstock Lumber Co	62

Metal Lath

Galt Art Metal Co	
Metallic Roofing Co	53
Noble C. W	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co	53

Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	[illegible]
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	58
Britnell & Co	51

Pipe

Canadian Pipe Co	58
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	58
Municipal Construction Co.	16
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co.	34
Paterson Mfg. Co.	13

Pile Driving

	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery

Beatty & Sons, M.	54
Goulds Pump Co.	57
Hopkins & Co., F. H.	64
Inglis Co , John	24
Leonard & Sons, E	55
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	57
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials

Barrett Mfg. Co.	13
Galt Art Metal Co.	
Metallic Roofing Co.	53
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies

Factory Products Limited	
Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	58
Climax Road Machine Co.	21
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	52
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	31
Standard Drain Pipe Co.	56

Sand

Rogers Supply Co.	31
Sand & Supplies	59

Stone

	Page
Britnell & Co.	51
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	51
Corinthian Stone Co.	54
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	19
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	11
Sand and Supplies	59

Structural Iron and Steel

Buffalo Steel Co.	19
Dominion Bridge Co.	18
Eastern Canada Steel Co.	15
Hamilton Iron & Steel Co.	
MacKinnon Holmes & Co.	
Pennsylvania Steel Co.	18
Phoenix Bridge & Iron Works	19
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H.	19

Shovels (Steam)

Beatty & Sons, M.	54
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Sons, E.	55

Safes and Vaults

	page
Taylor, J & J	19

Stone Cutters

Bailey-Underwood Co.	62

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co.	34

Tiles

Smith Marble & Construction Co	

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	59
Marsh & Henthorn	53
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	19

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	
Marsh & Co. Jas	54
Standard Fitting & Valve Co	5

Ventilating System

Gardiner & Gaskill	

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	8

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	54

Water Wheels

Canadian Boving Co.	

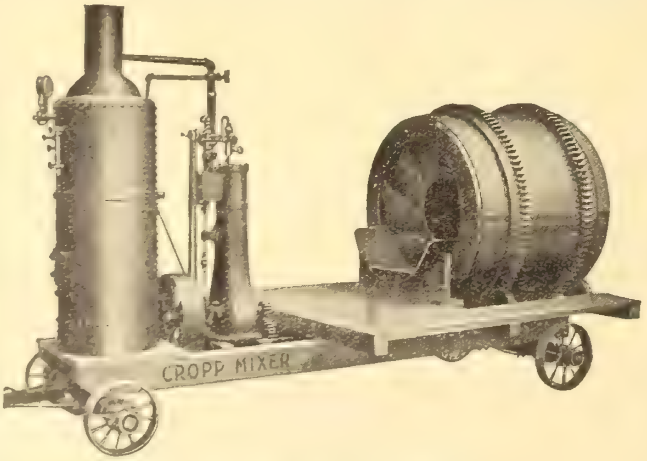
Wire and Cable

Factory Products Limited	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

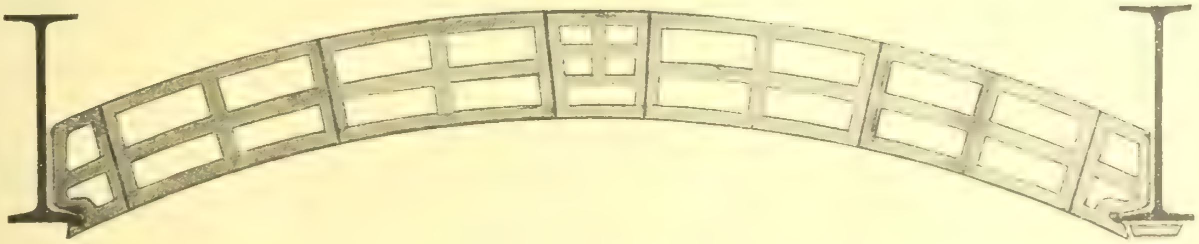
Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

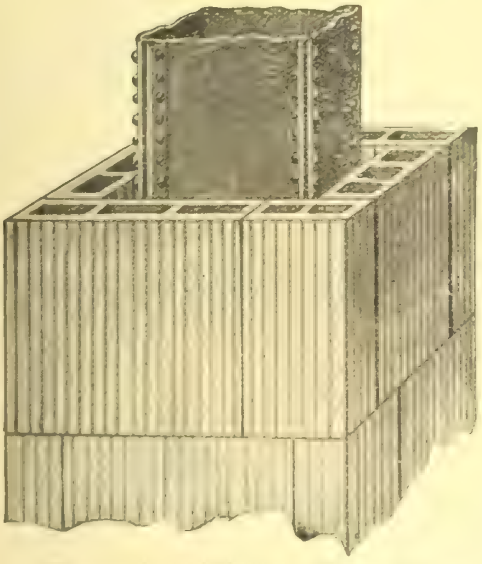
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

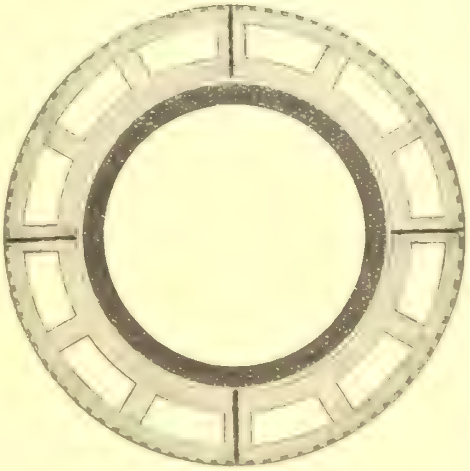


Section showing style of Skewbacks and Keys

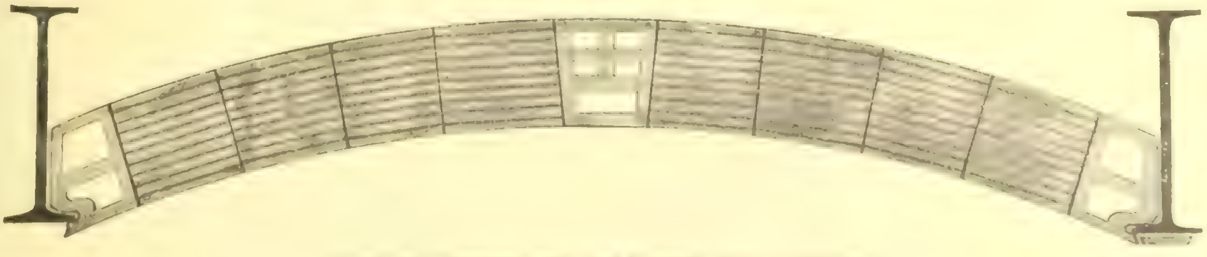


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



Section showing style of Skewbacks and Keys

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong **Flexible** **Durable**

Thos. & Wm. Smith, Limited

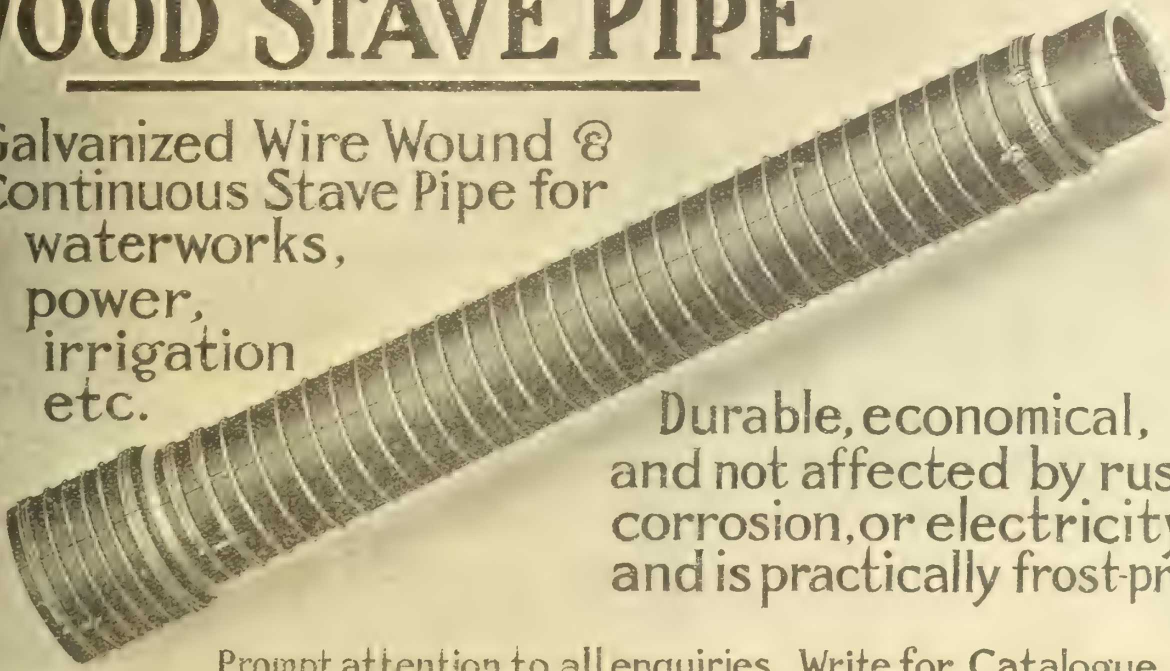
Established for over a Century

Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

WOOD STAVE PIPE



Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley & Muir Company,
Limited
Brantford, - Canada

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

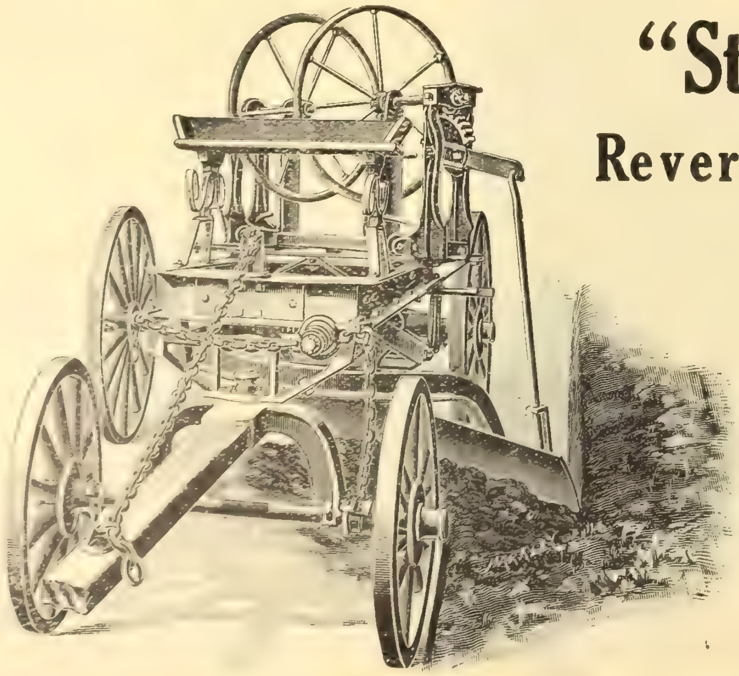
Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

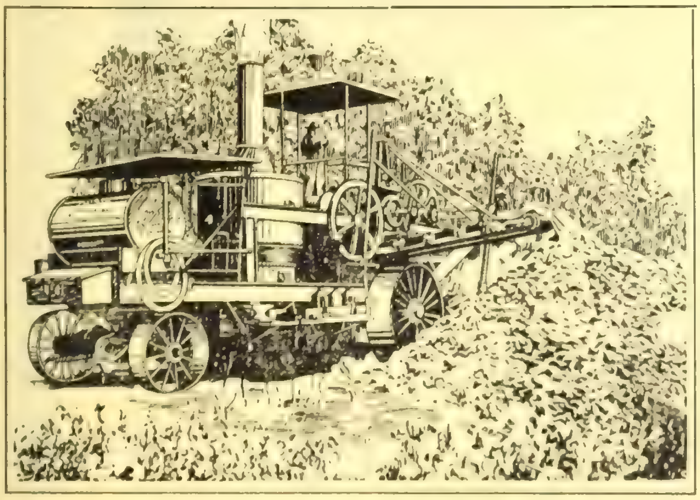
Designers and builders of road making and contractors' machinery

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

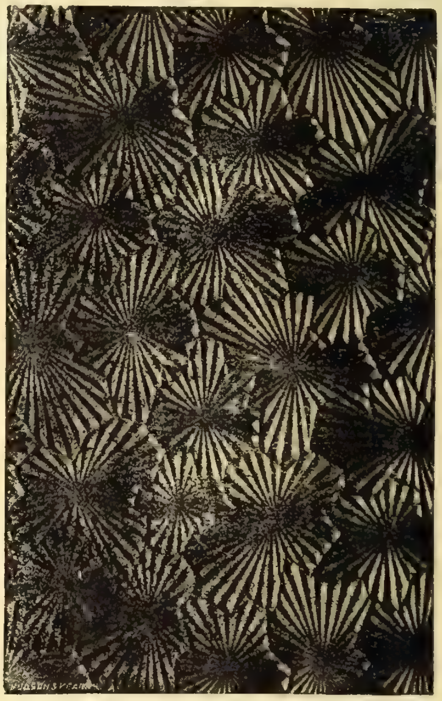
Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Chance's Double Rolled Cathedral Glass

is brighter and more translucent than the ordinary Rolled Cathedral Glass. It cuts true and easily, and works up handsomely into leaded windows. Made in a very large variety of tints.



Chance's Figured Rolled
Muranese (small) Pattern

Chance's Figured Rolled Glass is famous for its deep, brilliant patterns, easy cutting qualities and attractive tints. The popular "Muranese" pattern illustrated here is made in three sizes, of which this shows the smallest.

"Flemish" Glass, made only in the glass works of Chance Bros. & Co., near Birmingham England, is a new and most attractive Ornamental Window Glass, unsurpassed for character and brilliancy.

Write for samples of Chance's Figured Rolled, Muffled, Double Rolled Cathedral and Flemish Glass.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Barrett Specification Roofs

Pennsylvania R. R. Terminal

THE Pennsylvania Railroad Terminal in New York City is the central feature of an improvement whose total cost will reach $100,000,000. It is a magnificent structure built for efficiency, almost regardless of cost.

It is covered with a Barrett Specification Roof with vitrified tile surface.

Would such a roof have been used on this magnificent, modern, fireproof structure if anything better could be obtained at *any* price? Surely not.

The fact is, a Barrett Specification Roof is the most economical roof covering yet devised. And it has a record of fifty years of satisfaction behind it.

In addition to the great roof, the foundations are waterproofed with Coal Tar Pitch and Felt—the same materials as are used in Barrett Specification Roofs.

Before construction was commenced, a careful study was made by the chemists of the Pennsylvania Terminal Company of many waterproofing compounds, with the result that it was decided to use Coal Tar Pitch instead of Asphalt.

About 4,000,000 pounds of Barrett's pitch were used for underground work and roofing.

The Barrett Specification should be in the hands of every architect, engineer and owner of buildings. Copy of it free on request.

The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

When You Have Sewer Pipe to Buy

Sizes 4″ to 24″ inclusive

you will not regret it if you insist upon

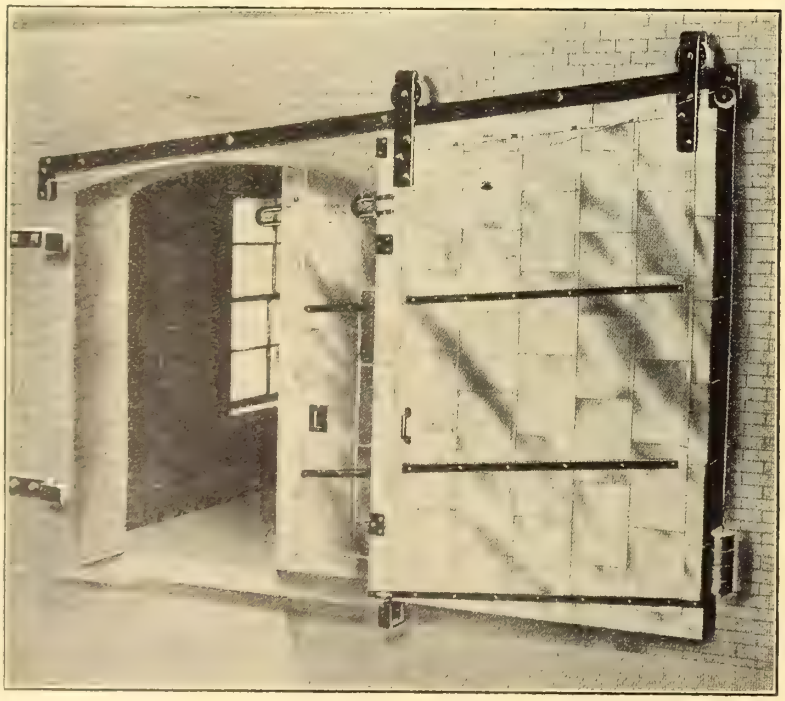
"MIMICO" PIPE

being used

The slight extra cost will be entirely lost sight of the moment you shove open the door of the first carload.

TRY US ONCE

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones: Toronto Connection, Park. 422, Evenings Park. 3888 and 3889



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

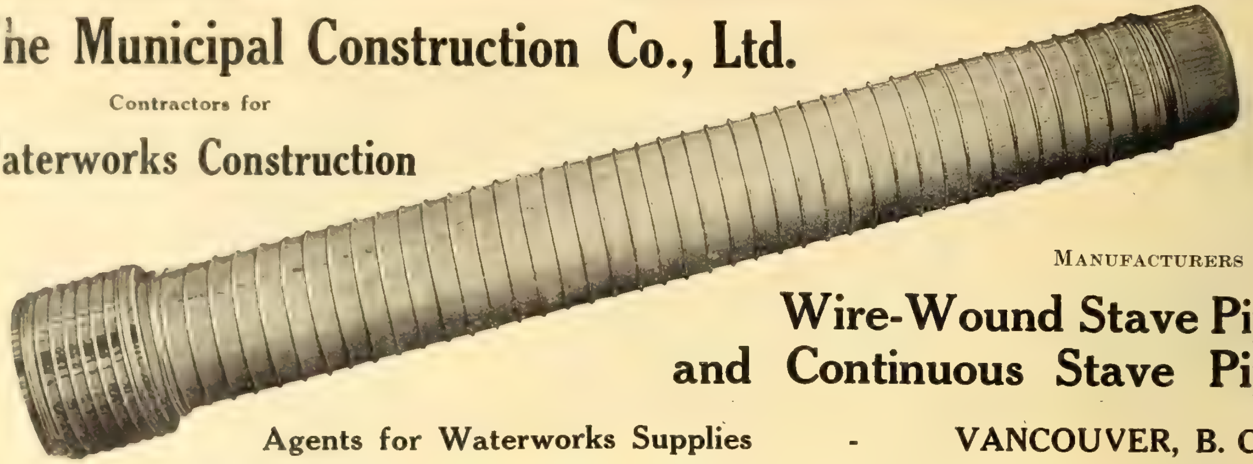
Head Office - - QUEBEC, P.Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction



MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Kawneer System

The Store Front

Construction Pre-eminent

All metal construction from I Beam to sidewalk, producing the **all-glass** effect.

The Latest **Kawneer** improvement is the **regulated** ventilation feature providing abundant, effective, ventilation or air-tight dustless show windows at will.

Kawneer Store Fronts are architecturally beautiful, corner bars small, inconspicuous yet the strongest and most durable. Sash provides for ventilation and drainage, cushion friction grip.

Easy to install. Metal transom and sill construction if desired.

The pinnacle of mechanical perfection.

Send for Book of Details it Fully Illustrates

The Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Office: 103 Pacific Bldg.

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

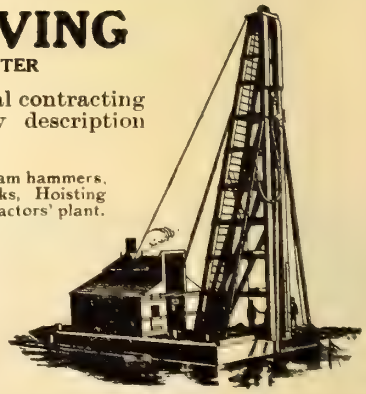
PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

**Reinforced
Concrete
Construction**

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

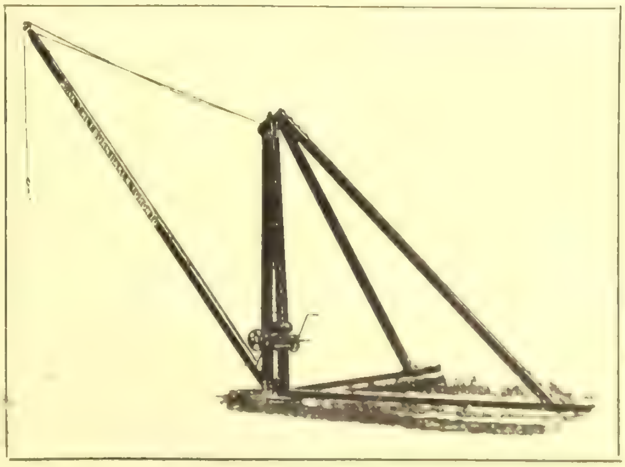
Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

No Better Derricks on the Market

Men who know the comparative value of Derricks will tell you that for all kinds of construction work there's nothing better made than

John T. Hepburn
Scotch Derricks

They are made in standard sizes ¾ ton upwards this means that any part can be replaced at short notice. Are fitted with single and double purchase gears—changeable in a moment from one to the other powerful band brake, and an ample length of first quality wire rope. The special safety catch locks the boom and prevents accidents. They may be operated either by hand or power.



These derricks are in use by leading contractors in all parts of the country. If you have any use for a Derrick it will pay you to investigate our line. Write to-day.

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

——Bridge and Construction Dep't.——

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 TORONTO

Branches: Vancouver and Winnipeg Montreal

The

Phœnix Bridge & Iron Works

MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds

(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.

Limited

TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

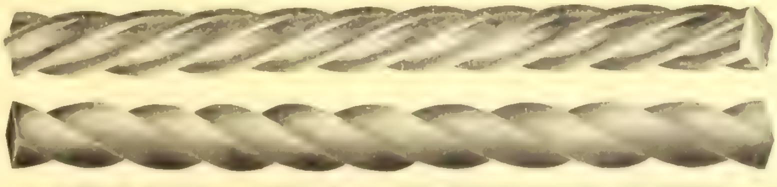
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing. Also ¼ soft steel rounds.

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC T'WISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. Suburb of Buffalo N. Y.

Toronto Office
117 Home Life Building

Herringbone Metal Lath

is sold to intelligent purchasers by reason of its superior quality, not its low first cost.

The use of the superior article results in a saving in amount of lath used, a saving in cost of erection, a saving in cost of plaster, and a saving in carpenter work. Any one of these savings alone would justify the Herringbone price.

The total saving explains why we are doubling our capacity.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - **Phone Beach, 230**

No. 872 is a Galvanized Steel Ridging at a "Wood Price"

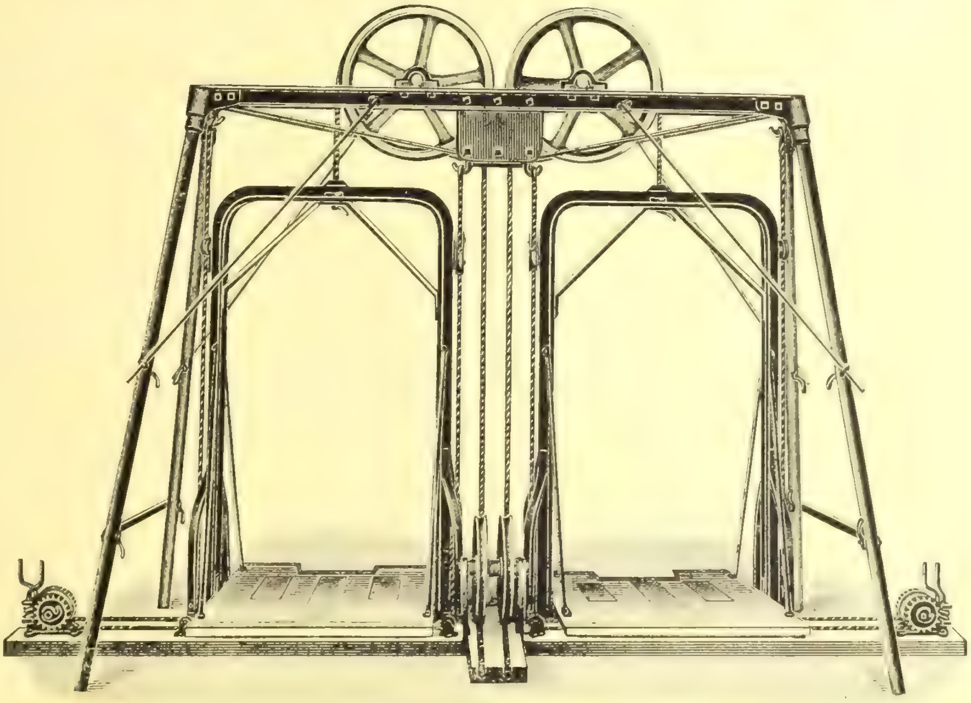
Very few will choose to erect a wood ridge when the advantages of No. 872 are explained to them. It is much more ornamental than wood. And because it is made of galvanized steel it is several times as durable as wood. No. 872 is easy to erect. It is made on special machinery, in 10 ft. lengths, and is absolutely straight. The lengths fit together accurately. No wood filler is required. No. 872 is sold at practically the same price as ordinary wood ridge. Contractors who recommend No. 872 Ridge certainly use good judgment.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Montreal, P.Q. **PRESTON, ONTARIO**

Contractors and Builders Attention!

If you would increase your profits purchase a

Climax Material Elevator



With a **Climax Material Elevator** the upper stories of a building can be built at but a trifle greater expense than the ground storey, and the time occupied in putting up the building is decreased to about one-third, enabling the contractor to erect a greater number of buildings during the building season. The first cost of a machine cuts but a small figure when divided up on a very few contracts. We can also supply this style of elevator with single platform, which will carry two barrows.

Testimonial received from Mr. Edward Webb, Orillia, who purchased a **Climax Material Elevator and Hoisting Engine** one year ago:

TO WHOM IT MAY CONCERN :—This is to certify that we purchased a **Climax Hoisting Machine** with a four horse power gasoline engine attached, also one complete **Climax Material Elevator** with two platforms. Same has been installed in our contract—the Tudhope new factory now under course of construction. We find that this hoist will take up material fast enough to keep thirty (30) bricklayers supplied with material. The machine has so far proven most satisfactory.

Yours truly,

Sgd. Edward E. Webb.

FOR CALALOGUE APPLY

Climax Road Machine Co.

Hamilton, Ont.

Read why PEDLAR NESTABLE CULVERT

saves farmers money lowers taxes—betters roads

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:

This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

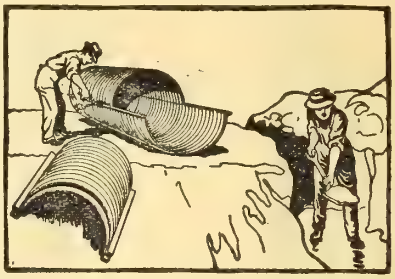
And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

G. H. Pedlar

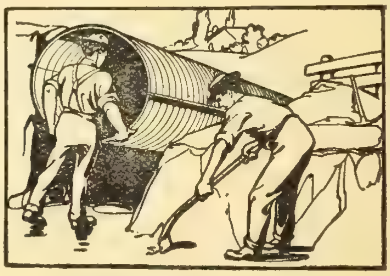
For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders—curved while cold, so the sizes never vary a fraction. These half-cylinders are then corrugated by a pressure of sixty tons to the square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.



PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no makeshifts—but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. Being made in half cylinders, they are nestable—so that a great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight and carriage costs, and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the whole story clear. State your possible needs when you write for the book, and let us quote prices.

HALIFAX
16 Prince St

ST. JOHN, N.B.
42-46 Prince William St.

QUEBEC
127 Rue du Pont

MONTREAL
321-3 Craig St.

OTTAWA
423 Sussex St.

TORONTO
111-113 Bay St.

LONDON
86 King St.

CHATHAM
200 King St. W.

PORT ARTHUR
45 Cumberland St.

WINNIPEG
76 Lombard St.

REGINA
1901 Railway St. South

CALGARY
1112 First St. W.

VANCOUVER
821 Powell St.

VICTORIA
434 Kingston St.

ADDRESS OUR NEAREST WAREHOUSE.
WE WANT AGENTS IN SOME LOCALITIES
WRITE FOR DETAILS.
MENTION THIS PAPER.

Send Now For Free Book
BOOKLET NO. 23
And Sample Culvert

Address Nearest Warehouse of

THE PEDLAR PEOPLE
OF OSHAWA, - - CANADA

(Largest Sheet Metal Manufactory in the British Empire)

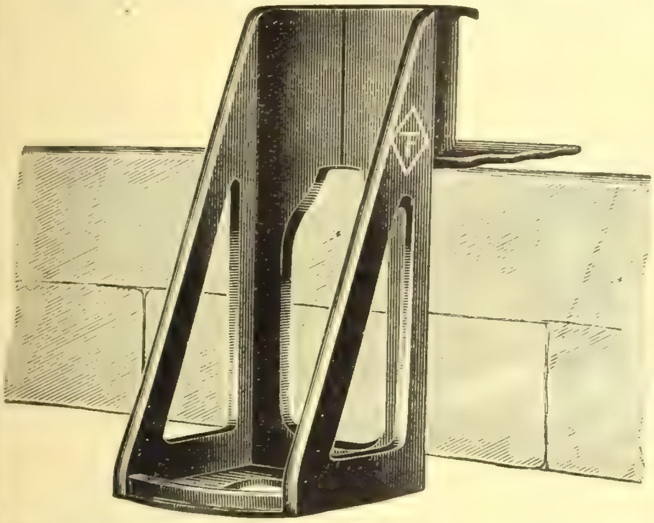
The Pedlar People of Oshawa
Ontario, Canada

include in the output of their immense factory the below-mentioned specialties in sheet metal building material. Samples, descriptions and prices of any of these will be readily forwarded postpaid and free upon request addressed to the Pedlar warehouse nearest to the inquirer:

Pedlar Nestable Culvert, Oshawa Steel Shingles, Steel Roofing, Corrugated Iron, Metal Shutters, Skylights, Conductor Pipes, Finials, Art Steel Ceilings, Art Steel Siding, Eave Troughs, Prepared Roofing, Metal Doors, Metal Lath. Ventilators. etc.

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

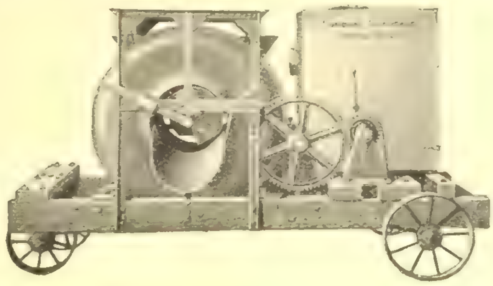
If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

London Standard Drum Batch Concrete Mixer



The very latest ideas and improved plans of construction are embodied in this machine. CONTRACTORS it will be well worth your while to write for full particulars.

We Can Save You Money { On the first cost of machine / Cost of maintenance / Cost of producing Concrete

This machine is manufactured in several sizes and with every equipment desired. Let us tell you all about it. State capacity required when writing. We also manufacture the now famous LONDON AUTOMATIC BATCH MIXERS No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full Line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

Hardwood Flooring

Those who use

"Empire Brand"

are delighted with its perfect finish and elegant appearance and will use no other. Only the best lumber is used. We are equipped and have the workmen to turn out the highest class of "hardwood flooring" on the market.

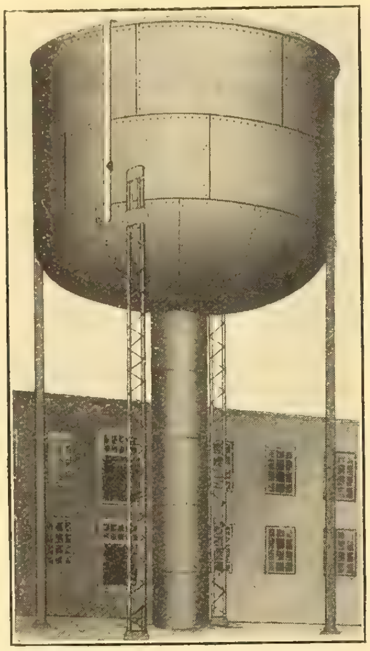
J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent — C. A. SPENCER, 55 St. Francois Xavier St.

Heavy Plate Work

We Manufacture and Erect:

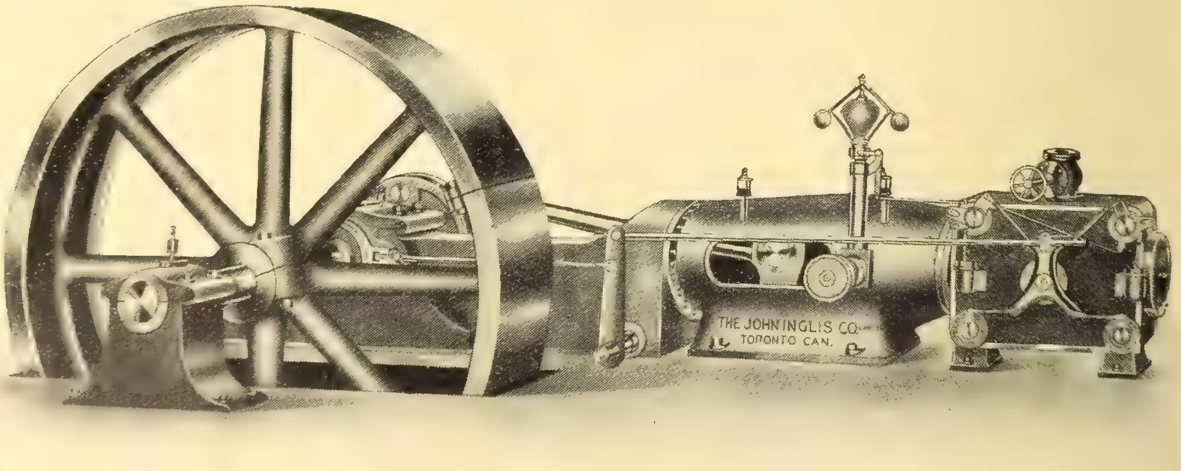
- Stand Pipes
- Penstocks
- Water Tanks
- Dryers
- Fertilizers



100,000 Gallon Water Tank,
built and erected by us for the Michigan Central Railway at Waterford, Ont.

- Blast Furnaces
- Flumes
- Smoke Stacks
- Special Machinery
- Plate Work of all kinds

"INGLIS" Corliss Engines built for a purpose, to last a life time


THE JOHN INGLIS CO.
TORONTO CAN.

Every Engine guaranteed to do just as represented.
Write us for particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Chippawa, Ont.

The ratepayers defeated the by-law to raise $30,000 to provide for installing a waterworks system in the village. This is the second time the waterworks by-law has been defeated.

Edmonton, Alta.

Resume of Engineer Potter's report on sewage and water systems. Sewer System:—Cost of sewer system, $4,000,000. Provision for city of 250,000 people. Sewage will be drained into tunnel sewer ten feet six inches in diameter, to be carried from present Rat Creek outlet to the river along the eastern boundary of penitentiary property. Cost of Rat Creek tunnel sewer, $137,000; outlet, $23,000; connection with system, $7,000. A storm drain for St. James district. A district sewer for Bellevue district and the territory east of the city as far as Packington. (This district is out of the jurisdiction of the city of Edmonton authorities.) A disposal plant of 85 acres of land on south side of river opposite penitentiary. Sewage to be carried beneath the river to disposal plant by syphon. Both sewer and drainage from parts of the city which can be economically carried below the city to be covered by system of conduits. At other points where the cost of conveying the storm water to a point below the city would be prohibitive, separate conduits to be installed. Provision for two drainage systems in west end, one for draining storm water and the other for sanitary sewage. The other portions of city will discharge both via Rat Creek sewer. Water System:—Cost, $400,000. Provision for city of 250,000 population. Declares that proposal to establish pumping station at Pigeon lake unfeasible. Present site suitable for future needs. Laurier Park (McGibbons property) entirely unsuitable as site for pumping station. System of water purification to alleviate danger of contamination; hence location of pumping site in river immaterial. In future, extensions of pumping plant, two stage system of pumping is desirable, viz., water should be raised from river level to that of filtration plant by low lift pumps, then pumped from clear water basin into distributing system. Installation of new feed main and new standpipe in the north-east of city. Mr. Potter states that reinforced concrete should be used in construction. The detailed cost of the sewage system is as follows: Combined Sewers—North central system, 4,920 acres, $2,286,324; Bellevue, 611 acres, $2,663,707. Separate Sanitary Sewers: West separate system, 3,91[illegible] acres, $195,125. Storm Drains: St. James storm sewer district, 1,250 acres, $343,662; west storm water district, 1,817 acres, $228,912; total, $3,917,760.

Moncton, N.B.

The report of W. Chipman, expert engineer, Toronto, has the following suggestions and recommendations: The two mains cannot supply the electric pumps with sufficient water to get the full benefit; the capacity of the present reservoir is inadequate, particularly in a dry season. It cannot be depended upon for a greater supply than at present. The construction of another reservoir is recommended and a site selected on McNutt brook, some 3 or 4 miles from the city. An estimate of the cost of the new reservoir, pumping station and 20-inch main, $209,000; with filtration plant and meters, $254,000.

Montreal, Que.

Ald. U. H. Dandurand has purchased the Fraser and Boyer farms owned by the Lachine Hydraulic Company. The intention of those interested in the purchase, it is stated, is to have after the lots are laid out, the streets macadamized, cement sidewalks laid down, etc., before building operations start. The Lachine Hydraulic plant will supply lighting and power required.

A city boulevard plan was submitted by Mr. W. S. Maxwell, architect, to the Parks Commission. This project taking Victoria Square as a central point, provides for a spacious highway, diverging east and west to the city limits and forming a large artery throughout the length of the city in the neighborhood of Dorchester and Lagauchetiere streets. The Commission took the matter under advisement.

Tenders will be invited shortly by the Board of Control for the construction of sewers in the undermentioned streets or sections of streets, namely: Comte street, from St. Hubert street to Labelle street; Boyer street, from Everett street to Rosaire street; Montee du Zouave, from St. Denis street to end of Montee du Zouave; De Fleusimont street, from Dufferin street to Christophe Colombe street; Notre Dame de Grace avenue, from end of existing sewer to 500 feet northwards.

Rouleau, Sask.

The city has voted $45,000 for the installation of a waterworks system.

Toronto, Ont.

The proposal of the board of directors of the National Exhibition to pave the roads in the Exhibition was sent to the board of control for approval. Manager, Dr. Orr.

The construction of the following asphalt pavements has been recommended by City Engineer Rust: Dovercourt road, $21,893; St. David street, $5,212; Rebecca street, $1,970; Armstrong avenue, $936; Danforth avenue, $12,242.

Vancouver, B.C.

The local improvements passed recently for wood block pavement, asphalt and bitulithic, and widening Granville street to Alma road. Total, $300,000.

It is probable that at the January elections the ratepayers will be asked to approve a by-law carrying a large amount for the extension of the city's waterworks system. This will cover not only city extension work but will also provide for the enlargement of the system on the north side of the inlet. Superintendent of Waterworks, Madison; engineer in charge, H. M. Burwell.

Walkerville, Ont.

Tenders will be received by Cecil H. Robinson, town clerk, up to November 8, for construction of a brick sewer on Windermere road. Owen McKay is the engineer. See advertisement in "Tenders and For Sale Department" of this issue.

Winnipeg, Man.

Tenders addressed to Chairman, Board of Control, will be received until Nov. 4, for supply of quantity of sewer pipe and specials. Specifications at office of city engineer. M. Peterson, secretary.

Tenders addressed to the Chairman, Board of Control, will be received until Nov. 14th for supply of quantity of cast iron water pipe, valves and hydrants for domestic water works system. Specifications at office of City Engineer, M. Peterson, secretary.

In regard to the proposed supply of water from the Winnipeg river, City Engineer Ruttan estimates the cost as over $6,000,000 and the time to complete it four years. In estimating this, two pipe lines are considered, capable of delivering 23,000,000 gallons daily. The following is estimate of the report of the Water Commission of 1907, plus 15 per cent.: Land and right of way, $18,000; intake works, $150,000; pumping station, Winnipeg river, $400,000; pipe lines, $3,399,000; coagulating basin, $65,000; filters, $375,000; filtered water reservoirs, $270,000; Winnipeg pumping station, $507,000; keepers' houses, $12,000; telephone lines, $11,000; tramway, $150,000; total, $5,357,000; add 15 per cent. $803,550; total on basis of Water Commission's report, $6,160,550.

AWARDED.

Moose Jaw, Sask.

The Canadian Fire Engine Company, Ltd., London, Ont., was awarded the contract for supply of combination hose wagon and chemical wagon, $1,455. W. F. Heal, city clerk.

New Westminster, B.C.

Contract for the construction of approximately two miles of sewer was awarded to F. F. Sinclair, of Vancouver, at $55,795. Other bidders were: Messrs. Hugh & J. I. McDonald, of Vancouver, at $59,965; the Puget Sound Bridge & Dredging Company, Vancouver, at [illegible]; [illegible] & Company, Vancouver, [illegible]; [illegible] & Gzowski, at $99,500.

St. Catharines, Ont.

The following tenders for pavement on King and Queenston streets respectively were received: Warren Paving Co., $30,[illegible]; [illegible] $30,624; City engineer, $31,854, $31,011. The engineer recommended the acceptance of the tender of the Warren Bituminous Paving Co., of Toronto, it being the lowest, the contractors to proceed with the work when notified by the engineer.

Vancouver, B.C.

Tenders were considered as follows: [illegible] paving in rear of postoffice [illegible] Block, M. P. Cotton, $2,280; [illegible] & Doctor, $3,630; T. R. Nickson & Co., $[illegible]; Romano & Pinto, $1,950; awarded to Romano & Pinto. Resurfacing Abbott street. Warren Construction Company, section from Hastings to Cordova, $3,349.50; from Cordova to Water, $3,-[illegible], same firm.

Victoria, B.C.

The contract for paving was awarded to the [illegible] Asphalt Paving Company, $33,204. A. Smith, city engineer.

Railroads, Bridges and Wharves

Chatham, Ont.

Tenders addressed to W. Abraham, reeve Tp. of Chatham, will be received until November 5th for construction of two bridges over Running creek dredge cut west of this town. Tenders may be either for steel or concrete. Plans, etc., at office of township clerk, Chatham, and at Shaw's hardware store, Wallaceburg.

Crofton, B.C.

Construction is to be begun forthwith upon a line of railway from Crofton to Cowichan lake in pursuance of the agreement between the E. & N. Railway Co. and the American Securities Company. At Osborne Bay, near Crofton, the Empire Lumber Company, an organization subsidiary to the Securities Company, will erect a sawmill at the cost of $1,000,000. This will be the largest plant in British Columbia.

Edmonton, Alta.

Rumors that the C.N.R. interests are going to take over and build the Alberta and Great Waterways Railway are revived by the fact that several parties of surveyors have been sent out to the north country for Mackenzie & Mann.

Fredericton, N.B.

Preliminary arrangements for the rebuilding of the Perry Point bridge across the Kennebeccasis river in Kings county are under way. Messrs. George B. Jones and James A. Murray, M.P.P., are interested.

Ottawa, Ont.

Work will be started this fall from the Ottawa end of the Canadian Northern line from here to Toronto, via Smith's Falls. The company has completed the purchase of its right of way between here and Smith's Falls.

The joint committee of Board of Trade and City Council will petition council for funds to have new entrance project and feasibility of C.P.R. tunnel looked into.

Port Stanley, Ont.

The cost of the desired improvement here is estimated at $650,000, and the deputation which waited upon the Dominion Government asked that a grant of $250,000 be included in this year's estimates. Dredging and breakwater is required.

Quebec, Que.

An important deal has just been consummated by which Mr. J. G. Kilt, of Ottawa, has acquired all the damaged iron and steel work of the demolished Quebec bridge.

Red Deer, Alta.

The Canadian Pacific Railway Company will build a 1,000,000 gallon reservoir near here.

St. John, N.B.

Engineer Davy has begun to make borings on the site of first two docks to be built at Courtenay Bay. Extensive construction work is expected to be begun early in the spring to provide terminal facilities for the Grand Trunk Pacific.

Toronto, Ont.

The Temiskaming & Northern Ontario Railway, it is stated, have been able to secure a suitable location for a new route from North Bay to Riddle, 34 miles north. The proposed new route lies eastward of the present one, and will not only save several miles in actual distance, but will cut down the grade almost one-half.

The Works Committee of the city council have added a by-law for $75,000 to construct a subway on Coxwell avenue, and another for $175,000 for a viaduct to connect Parliament street with the proposed Bloor street viaduct.

Victoria, B.C.

The route of the C. N. Pacific through Vancouver Island has been determined and will involve the construction of 153 miles of railway instead of 100 miles as originally contemplated. Tenders for the construction of the railway will be called for as soon as the engineers can complete their location surveys, and the whole work pushed to completion with all possible speed.

Winnipeg, Man.

Tenders are being called until November 10th for erection of timber trestle at Mileage 53.7, Crow's Nest Sub-division. Maximum height, 115 feet; length, 750 feet. Plans, etc., at following offices: Assistant Chief Engineer, Winnipeg; Division Engineers, Moose Jaw and Calgary; Resident Engineer, Cranbrook; H. B. Walkem, acting division engineer, Calgary.

AWARDED.

Hamilton, Ont.

The contract has been let by the Beach Commission for the building of a revetment wall at the Beach, 100 feet out in the bay to Joseph Battle of Thorold, $23,000. The work will not be started until spring. G. G. Barrow, engineer who drew plans.

Port Mann, B.C.

The C.N.R. has awarded to the Northern Construction Company a contract for building a large wharf, 1,000 feet long and 100 feet wide.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

A by-law to authorize expenditure of $40,000 on new east end school will be submitted shortly. Plans will be asked for among the city architects and tenders invited with a view to beginning construction next year.

Cobalt, Ont.

Plans are well under way for the establishment of a Y.M.C.A. here. A site has been purchased oposite the town hall. Total expenditure estimated at about $35,000.

Camrose, Alta.

We are advised that the Scandinavian College now under consideration will not be erected until late in 1911. O. B. Olson, secretary-treasurer.

Carleton Place, Ont.

A vote was taken of the congregation of Zion Presbyterian Church, Carleton Place, which has resulted in the decision that a new church will be built on the site where the one was burned last summer.

Calgary, Alta.

At a recent meeting of the school board it was decided to erect two new cottage schools and purchase sites for two schools and authorize the purchase of a 3-acre site in Hillhurst and one in East Calgary. All this was considered necessary owing to the threatened overcrowding ond the necessary accommodation in the spring.

High River, Alta.

The by-law to expend $3,200 on installation of steam heating plant, etc., was defeated.

Halifax, N.S.

The following tenders were received for Memorial Tower: Falconer & MacDonald, $24,829; S. A. Marshall & Son, $29,762; M. E. Keefe Construction, $34,160. S. M. Brookfield, Ltd., $23,960.

Melville, Sask.

Tenders were called until Nov. 1st for furnishing materials and erecting a frame hospital building here. Specifications, etc., at office of secretary-treasurer, J. Crow.

Moose Jaw, Sask.

The congregation of St. Andrew's carried a motion to erect a building for congregational purposes in the northwest of the city at once. J. L. Bryant and J. E. Chisholm are interested.

Montreal, Que.

Tenders will be called shortly for the construction of a new art gallery building. Messrs. Edward and W. S. Maxwell, architects.

The management of the Montreal Association for the Blind have decided to erect a thoroughly educational and industrial institution which will cost in the vicinity of $100,000. P. E. Layton, treasurer.

A building permit has been issued for the construction of a branch building of the Y.M.C.A. on Park avenue, $75,000.

Mr. Joseph Vanier, architect, 5 Beaver Hall Square, will be inviting tenders shortly for the erection of a Roman Catholic Church in Southbridge, Mass. Approximate cost about $125,000.

North Battleford, Sask.

It is stated that tenders will be called at once for the construction of hospital mentioned in last issue. Address Grey Nuns of Montreal.

Nanton, Alta.

The county council have decided to issue $6,000 electric light and $1,500 fire protection debentures.

Ottawa, Ont.

At the next meeting of the Children's Aid Society Mr. John Keane will present plans for an addition to the Detention Home.

The Separate School Board will take up the enlarging of St. Roch school early next year.

Tenders for the installation of electrical fixtures in the city hall are as follows: J. A. Ellacett, $2,170; Ottawa Electric Company, $2,243, or $2,0004 for fixtures of their own make; Marchand & Donnelly, $2,379. Architect C. P. Meredith's estimate was $2,300.

Paris, Ont.

Tenders will be received until Nov. 10th for the repair of the armory. Eug. Fiset, Colonel, Deputy Minister of Militia and Defence, Ottawa.

Stratford, Ont.

The Perth County Council authorized the issue of debentures to the amount of $11,000, 15-year, for the erection of registry office for the North Riding, County of Perth.

South Vancouver, B.C.

A movement is on foot to provide a public hall for South Vancouver. No plans have been drawn yet, but a 3-storey structure is contemplated. Councillor Baird and Messrs. G. Greenslade, F. E. Elliott and Thomas Houston are interested.

Toronto, Ont.

None of the plans for the new Government House will be accepted, but as the competition was carried on in good faith, it has been decided to award the prizes as follows, namely, the first prize of $1,000 to George W. King, and the second prize of $500 to G. W. Gouinlock, both of Toronto. Mr. Heakes, architect of the Department of Public Works, has been asked to furnish plans and has consented to do so.

The architects in charge of the new Knox College building are Mr. F. Darling, of Toronto, and Mr. P. E. Nobbs, of Montreal. The committee appointed to confer with them comprise Principal Gandier, Messrs. D. Bruce Macdonald, A. M. Campbell and others.

Vancouver, B.C.

Plans are now under consideration for a new Church of England in Fairview known as St. George's. The site has been secured. Rector, H. M. Jackson; chairman of building committee, William Haddock.

Victoria, B.C.

A by-law is being prepared to authorize the granting of a site for the new theatre mentioned in Oct. 5th issue. Amount of private subscription, $70,000.

Winnipeg, Man.

The by-law for new city hall was referred to works committee.

The parks board was authorized to set aside a portion of Selkirk park for erection of proposed bath house.

Owing to alleged dissatisfaction among organized architects of the city over the regulations advertised to govern the competition for tubercular hospital plans, only four sets of drawings have been received. It has been decided to submit the drawings to Sterm, the celebrated hospital architect of Chicago, and to Dr. Lawrison Brown, of Saranac Lake. The committee appointed Ald. Macdonald and Ald. Wallace to take up the subject with the architects.

Tenders were called until October 28th for erection of school on St. Paul's for S.D. 1546 (centre St. Paul), near Bird's Hill, Man. Plans, etc., at office of architect, W. Wallace Blair, 400 Nanton Building. T. Turnbull, secretary-treasurer, S.D.

AWARDED.

London, Ont.

The London board of education has awarded the contract for the new Alexandra school on Colborne street to Hyatt Bros. for $44,754.

Melville, Sask.

The contract for frame school here was let to A. A. Cunningham, $1,079. H. Wilson, architect.

Moose Jaw, Sask.

The contract for excavation for Saskatchewan College here was awarded to H. Giles, $1,300. We are informed contracts for superstructure will not be let until the spring.

Toronto, Ont.

The contract for installing the ventilating apparatus in the Provincial Parliament Buildings was awarded to Purdy, Mansell & Company, of this city. The system will apply to the new northern wing and the one being rebuilt. Approximate cost, $50,000.

Victoria, B.C.

Contracts for three new public schools in the interior districts of British Columbia have been awarded as follows: Two-roomed schoolhouse at Glenbank, in the Slocan district, James Dancey & Company, Nelson, at $3,977; Okanagan Landing, one-room large schoolhouse, W. G. Simpson, of Vernon, at $1,750; and Yale Road, two-roomed schoolhouse, Thomas Turnbull, at $3,500. Construction in each case will begin at once.

Residences

Montreal, Que.

The apartment house on Bishop street in course of erection was destroyed by fire. Loss estimated at $50,000.

Tenders are being invited for the erection of a residence on Harvard avenue, Notre Dame des Graces Ward, for J. Harilton, Ferns, Esq. Plans, specifications, etc., prepared by Mr. W. E. Doran, architect, 180 St. James street.

Nelson B.C.

The erection of an apartment house is under consideration by Mr. E. Kerr. A. Carrie will visit neighboring cities to gain the latest information regarding the architecture of such buildings.

Ottawa, Ont.

A. Tracy, architect, is preparing plans for a residence for Cram Brothers, of Westboro, Ont.

Recent building permits include: Geo. MacDonald, brick veneer dwelling, Argyle avenue, $3,000; D. K. Edwards, brick veneer dwelling, Clemow avenue, $5,000; J. P. Band, brick veneer dwelling, Gordon street, $1,500; R. A. Kemp, dwelling, Oakland avenue, $3,500; F. X. Laliberte, brick veneer dwellings, St. Patrick street, $5,500.

Quebec, Que.

The residence of A. J. Price, Belvidere road, was destroyed by fire on the 26th ulto., involving a loss of several thousand dollars.

Victoria, B.C.

Richard Hall will build a 2½ storey residence on Linden avenue, $12,000. A permit for the construction was issued.

Building permits were issued as follows:

To Mrs. M. Banman, dwelling on Dallas road, $3,100; H. A. Porter, for a house on Linden avenue, $3,500; to T. L. Toy, for a house on Pendergast street, to cost $2,400; Mr. Richard Hall, dwelling to be erected on Linden avenue, $12,000; to Messrs. Moore & Whittington for a dwelling to cost $2,500, and to Miss L. M. Sylvestor, dwelling on Queen's avenue, $2,100

Winnipeg, Man.

J. A. Hudson is preparing plans for a $25,000 two storey apartment block.

Business Buildings and Industrial Plants

Crofton, B.C.

See "Railroads."

Calgary, Alta.

The C.P.R. will take immediate steps towards the erection here of a handsome, modern, several storey building. Wm. Whyte, vice-president.

Edmonton, Alta.

E. F. Wayman, of Regina, will start a soap factory here. A capital of $23,000 has already been subscribed. $40,000 is required.

Hamilton, Ont.

Wagstaffe, Limited, announce that they will enlarge their preesnt plant, the addition to be completed by next year. Estimated cost, $30,000.

The International Harvester Company has secured a building permit for an addition to the warehouse, to cost $60,000. W. H. Cooper is the contractor.

The Garlock Packing Company has purchased the factory on Queen street formerly occupied by the Ontario Tack Co. It is their intention to enlarge tne building and centralize business here.

Lachine, Que.

It is understood that the Canadian Tube & Iron Company lately incorporated at Ottawa for the manufacture of iron and steel pipes, and tubes, tinplates, etc., with a capital of $1,000,000, have had agents here looking after a suitable site for the erection of a large plant to employ several hundred men.

Medicine Hat, Alta.

We are informed that those in charge of the construction of the plant for the Alberta Rolling Mills Company were expected to be on hand last week to make arrangements for its construction. Estimated expenditure, $150,000.

Montreal, Que.

See "Power Plants."

A permit was issued to Transportation Limited Company for the erection of a building on St. Francois Xavier, between St. James and Notre Dame streets, $1,000,000. The architects are Messrs. Ross & McFarlane. They will be assisted by a firm of American architects.

The plans for the new Ritz hotel have been entrusted to Warren & Wetmore, of New York, and the outlook now is that construction will be started next spring. The negotiations for Wilson-Smith property have been closed.

New Westminster, B.C.

A. R. Snelgrove has purchased the corner of Columbia and Begbie streets, where he intends to erect a six storey business building.

Ottawa, Ont.

W. E. Noffke will call for tenders shortly for the Blackburn building.

The work of the new Blackburn building will be resumed. Sir William Mulock, presiding high court judge, has granted permission for the parties to settle their differences. Noted in last issue.

W. E. Noffke, architect, is calling for tenders for a business block including five stores to be built for Barrett Brothers on Main street. The building will be solid brick and will be two storeys high.

Tenders addressed to P. E. Ryan, secretary, Commissioners Transcontinental Railway, will be received until Nov. 15th for construction of ice houses at Springfield, Man., Redditt, Man., and Graham, Ont.

Peterboro, Ont.
The council granted a site for the factory of the Canadian Chicle Company on George street.

Penticton, B.C.
The Penticton Lumber Company has been incorporated for the purpose of erecting a sawmill and factory for the manufacture of piping for irrigation purposes. The company owns 11,000 acres of tamarac, and the capital is $200,000.

Portage la Prairie, Man.
Thompson Bros., of Duluth, wholesale manufacturers of boots and shoes, are to build a five storey factory here and the city council have voted to submit a bylaw to the people on Nov. 15th to grant concessions. A five storey factory 60 by 100 feet, of steel and brick construction, will be built and the firm will employ 150 hands the first year and 250 hands every year thereafter.

Regina, Sask.
It is stated that the plant of the Capital Flour Mills will be enlarged next spring. Messrs. Cook & Vanstone, owners.

St. Cyrille de Wendover, Que.
The sash and door factory owned by Mr. C. Caron here has been destroyed by fire with a loss estimated at $15,000.

South Vancouver, B.C.
Messrs. Greenslade & Houston, of the South Hill Brokerage, will build a three-storey block on the southeast corner of Fraser avenue and Ferris road. The building will have a frontage of 93 feet on Fraser avenue and will extend back 113 feet on the road. Construction work will be started by next January.

St. Boniface, Man.
Mr. R. P. Butchart, of Tod Inlet, B.C., one of the most experienced cement makers in Canada, will, it is stated, at once erect a plant in St. Boniface.

Strathcona, Alta.
The C.N.R. have purchased another 24 lots southward, thus provinding an excellent site for the station and freight buildings to be erected here for the terminal business of the C.N.R. southeast and southwest lines to Calgary.

Sydney, N.S.
The town of Florence, near here, owned by the N. S. Steel & Coal Company, suffered by fire on the 28th ulto., to the extent of about $100,000.

Victoria, B.C.
Messrs. Challoner & Mitchell and P. R. Brown, it is stated, will erect a large business block, five or six storeys, early in the new year. Total expenditure estimated at $400,000. Plans will be prepared at once.

The following were some of the heaviest losers in the fire of the 27th ulto: D. Spencer & Co., furniture dealers, $200,000 to building; Young & Company, building, $100,000; Five Sisters Building and stock, $150,000; Victoria Book & Stationery, building and contents, $100,000.

A company is being talked of with a view to erect a fruit preserving factory here. Capital will be about $50,000; Mr. Jas. Drumond, manager of Victoria Fruit Exchange is interested.

Vancouver, B.C.
Mr. Lincoln Chandler, of Birmingham, England, is in Vancouver in connection with the establishment of large engineering construction works in close proximity to the city. At least $5,000,000 will be expended upon this undertaking. The works will cover from 50 to 100 acres. Mr. Chandler is connected with the British Empire Bridge works of Birmingham, and is secretary of the Metropolitan Amalgamated Carriage & Wagon Company, Limited, of Saltley, Birmingham.

Application has been made for the first extension which covers the seven storey extension of the west wing of the Hotel Vancouver, fronting on Howe street and extending to the centre of the block, $200,000. Plans are now being prepared for the extension of this wing to Robson street at a probable cost of $300,000, and excavation for this building is now in progress. As soon of these Howe street structures are completed the management will be in a position to give over the present main hotel for the extensive enlargement in view.

Welland, Ont.
The United Motors, Limited, recently incorporated, will build the first airship factory in Canada at Welland, for the manufacturing of airships.

Windsor, Ont.
The Imperial Electric Company, E. J. Rumsey and A. W. Rumsey, 327 Jefferson avenue, Detroit, Mich., will soon erect a plant in Windsor for the manufacture of magnetos, it is reported.

Woodstock, Ont.
The Maximillian Machine Company of Buffalo has agreed to erect a factory here as a Canadian branch for the manufacture of pneumatic hammers and drills. Capitalization, $100,000. J. B. Porter, president.

Winnipeg, Man.
Tenders were called until October 26th for concrete foundations and steel grillage required for the Sterling Bank building, corner Portage and Smith street. Jas. Chisholm & Son, architects.

Information from Minneapolis, Minn., headquarters of the B. F. Nelson Manufacturing Company, states that it is the firm's intention to follow up the opening of their Canadian business by the erection of a factory here for the manufacture of roofing and building papers. F. P. Barker, local manager.

L. B. Lincoln, of Montreal, president of the Canadian Peat Society, is here to complete arrangements for installing a peat fuel plant, with a capacity of 100,000 tons. There are several good deposits of peat close to the city which he is investigating.

Plans are being prepared for the erection of a large new office for the C.P.R. on the site of the present Canada Life Building. Work, it is stated, will be commenced in 1911. Local officials, F. W. Peters, G. J. Bury and B. S. Jenkins.

AWARDED.

Brantford, Ont.
J. D. Tindall & Son, of Woodstock, have received the contract for the new Penman, Limited, factory at Homedale, Brantford, $52,000.

Guelph, Ont.
The contract for erection of large C.P.R. passenger station here has been awarded to Wells & Gray, Limited, engineers and contractors, 315 Confederation Life Building, Toronto.

Newmarket, Ont.
The contract for the new factory buildings being erected for the Office Specialty Manufacturing Company, Limited, has been awarded to J. L. Youngs, Stratford. Estimated expenditure, $75,000. By this addition, 63,000 feet of floor space is given. Mr. O. E. Tench, this town, arcnitect.

Ottawa, Ont.
George A. Crain has been awarded the contract for brick and stone work and fireproofing on the Slinn-Shouldis factory. James Mather is architect.

Port Arthur, Ont.
J. L. McRea, has been awarded a contract by the Marconi Wireless Telegraph Company for the construction of a wireless station here.

The C.N.R. has awarded the contract for the storage warehouse, with 32,400 square feet of floor space, to the Thunder Bay Harbor Improving Company.

Toronto, Ont.
Contract was awarded to A. B. Ormsby, Limited, for the roofing, galvanized iron and fire doors on factory for B. F. Harvey; also for same on addition to the Langmuir Mfg. Company's building.

Vancouver, B.C.
The sub-contracts for construction of 8-storey steel and concrete bank office building for the Bank of Ottawa are as follows: Heating, W. Leek; plumbing, E. A. Brown; wiring, Mather & Enell, all of Vancouver. Total estimated cost, $260,000.

Winnipeg, Man.
It is reported that the contract has been let to Norcross Bros., New York, for the erection of a large brick and sotne warehouse for the Hudson Bay stores. The building will be five storeys, 200 x 50 ft.

The contract for constructing the building here for the Canadian Bank of Commerce has been let to Peter Lyall & Sons. Estimated expenditure, $800,000; material, brick and granite, fireproof; frontage of 105 feet, depth, 120 feet.

Power Plants, Electricity and Telephones

Brandon, Man.
At a special meeting of the city council the Brandon Light & Power Company's franchise, granted by the city five years ago, was extended for another ten years, with an added clause stating that if the city, at the expiration of the life of the franchise, gave one year's notice of taking the company's plant over, and did not do so, the franchise would be extended for another five years.

Coquitlam, B.C.
Dominion Government Engineer J. R. Freeman has finished his investigations at Coquitlam lake and will shortly make his report to the Government at Ottawa. In the main, Mr. Freeman will demand the taking of more adequate precautions to entail the conservation of the purity of the city's water supply and will insist upon certain changes in the structure of the dam to be built by the Vancouver Power Company.

Englehart, Ont.
It has been decided to sell debentures for $30,000, covering a period of 30 years, for the purpose of developing the power at High Falls to generate electricity for the town.

Edmonton, Alta.

Edmonton is endeavoring to effect a cooperation with other towns and cities in the province in bringing influence to bear on the Provincial Government to take under its control the water power resources of the province and to develop and operate them for the benefit of the municipalities. In accordance with a resolution passed by the city council, the scheme as outlined is in principle the same as that which has been consummated in Ontario by the Hydro-Electric Commission.

London, Ont.

In regard to the proposed radial line between Sarnia and this city, it is said that English capitalists have agreed to take over the whole stock and build the road, which includes branch lines to Grand Bend on Lake Huron, Strathroy, and other points. D. A. Stewart, promoter.

Medicine Hat, Alta.

It is reported that the Alberta Electric Railway Company is applying to the Dominion Government for a charter to instal telephone and telegraph lines, to construct and operate light and power plants, to acquire and operate coal mines, and to construct and operate an electric railway to connect Medicine Hat, Calgary, Lethbridge, Banff and intermediate towns.

Montreal, Que.

The Lachine, Jacques Cartier & Maisonneuve Railway Company has forwarded copies of a plan to construct a railway line in and near Montreal to the Railway Commission and to the Board of Control. The company proposes to build its line from the junction of St. Laurent avenue and Cartierville avenue, in St. Laurent parish, ending at St. Catherine street. It is intended ultimately to connect the eastern and western terminals of the system in the city. The G.T.R. proposes to build an east end station with docks and wharves.

Rouleau, Sask.

The city has voted $15,000 for electric light system.

St. Vital, Man.

The proposition to construct a railway through this municipality has been withdrawn by one of the promoters, Jos. Bernier, M.P.P.

Toronto, Ont.

The city council, by a vote of twelve to nine, decided against the purchase of the Toronto Railway Company.

Tenders addressed to Chairman, Board of Control, will be received until Nov. 8 for cast iron lanterns and pillars for the Toronto Hydro-Electric system. Specifications at office of above, City Hall.

Weston, Ont.

Plans for the transformer plant will soon be submitted by the Hydro-Electric Commission. The present pumping station and equipment are very inadequate. Transformers of a different cycle must be purchased, and they will be on hand when the station is done.

Winnipeg, Man.

The board of control recommends to council the purchase of 305,000 pounds of copper wire, for use in the distribution of power about the city. Engineer [illegible] [illegible] the purchase, and while some of the material will not be required for 12 months or more, the contract will be let at once.

Tenders will be received by the chairman Board of Control, Winnipeg, Man., up to Nov. 7th for overhead wire and cables, and also up to Dec. 1st for poles and line supplies. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

The board of control has received a proposal from the Selkirk Light & Power Co. which now operates a steam plant. It was suggested that the city supply the company with all the power necessary for commercial and domestic purposes from the Point du Bois works. The only difficulty in connection with reaching an agreement is to be found in the transmission of power from this city to Selkirk. The local electric company has the franchise for the Main street road, but it is possible the city can secure rights over McPhillips St. and its continuation to the lake town, without purchasing a right of way. The board and the power committee will investigate.

AWARDED.

Toronto.

The Foundation Company, Limited, 76 Bank of Ottawa, Montreal, have been awarded the contract for constructing 10 sets of concrete piers for carrying the Hydro-Electric steel towers and cables. These piers are to be in the lake at Parkdale, and in general follow the line of the shore. The contractors have started work and same is progressing rapidly.

Vancouver, B.C.

The B. C. Telephone Company has awarded contracts for $500,000 of material as follows: To the Wire & Cable Company, Montreal, for about 250,000 feet of cable, average size of 200 pair of wires per cable, and for 25 tons of supporting wire; to the Northern Electric Company, Montreal, for 52 switchboard sections, and 3,000 telephone instruments.

Miscellaneous

County of Victoria, Ont.

Tenders will be received by J. R. McNeillie, clerk and treasurer, Lindsay, Ont., up to Nov. 16th, for the purchase of debentures of the above county. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Edmonton, Alta.

The following building permits have been issued recently: Blacket & Dawson, a store building, $5,000; to C. E. Smith, for dwelling on the west side of Ottawa avenue, $2,500; to Patrick Dunn and Frank McMahon for the erection of two dwellings on the east side of Sixth street, each to cost $2,400; to A. W. Robson, for the erection of a dwelling on the east side of Sixth street between Nelson and Vermilion, to cost $2,450; to Clifford C. Mitchell, a dwelling on the west side of Government avenue, $2,550; to Alex Stuart, K.C., a dwelling on the west side of Catherine street, $3,000.

Hamilton, Ont.

The following building permits have dition to building at 27 Park street north been issued: Stewart & McPhie, brick ad- for the Hamilton Mirror Plate Company, $2,000; W. H. Yates, Jr., brick stable on Ashley street, for A. H. Ewing, to cost $4,500; Adam Haist, brick dwelling on Blake street, $3,000; James Holden & Son, brick dwelling on Murray street, for H. White, $[illegible].

Montreal, Que.

Recent building permits include: George Paquette, 50 Dagenais street, house containing three dwellings on Parc Cartier, $3,500; A. McFarlane, 8 Hampton Court Apartments, four dwellings on Cedar avenue, $13,300; P. Garayt, 2004 Differin street, house containing three dwellings on Dufferin street, $4,000; Chas. J. Brown, 4263 St. Catherine street, Westmount, four houses containing four dwellings on Grey avenue, Notre Dame des Grace Ward, $15,000; Caron Bros., 278 Sherbrooke street west, a 5½ storey factory building at 233 Bleury street, cost $63,800;; Mde. R. Blouin, 1801 St. Denis street, house containing three dwellings on De Fleurimont street, $5,500; George Marcil & Company, 180 St. James street, two houses containing four dwellings on Mayfair avenue, Notre Dame de Grace Ward, cost $9,200; Fabrique St. Jean de la Croix, a church and presbytery buildings corner St. Lawrence Boulevard and St. Zotique streets, cost $20,000; Alf. Gagnon, 1437 Des Erables street, house containing three dwellings on Bordeaux street, $4,000; Alf, Gagne, 108 Joliette street, a two storey house on Duquette street, $2,000; H. Perreault, 780 Cowan street, house containing two dwellings on Cowan street, $2,000; Catellei Cie Limitee, Comte and Sanguinet streets, a two storey factory building, to cost $12,000; J. R. Laviqdeur, 210 Plessis street, two houses containing six dwellings on St. Urbain street, cost $4,000; J. D. C. Martin, 650 Bourbonniere street, two store buildings on St. Lawrence Boulevard, cost $10,000; S. M. Connell, St. Lambert, Que., a two storey house on Wilton avenue, cost $3,500.

Toronto, Ont.

A by-law for $500,000 will likely be submitted for improvements in Ashbridge's Bay.

Vancouver, B.C.

Recent building permits include: M. A. Whilan, frame dwelling, 723 Eleventh east, $2,000; J. S. Martin, frame store, 510 Keefer street, $6,000; R. F. & R. A. Bristol, frame dwelling, 1617 Twelfth avenue east, $3,000; F. Wilkinson, frame storage, Granville street, $3,500; J. A. Davis, frame dwelling, 550 Thirteenth avenue west, $3,000.

Winnipeg, Man.

The following building permits have been issued. J. Forseng, house, each side Burnell, $2,200; L. G. Hallgrimson, house, west side Home, $2,500; Merrick-Anderson, warehouse extension, west side Lewis, $5,000; E. F. King, house, west side Lipton, $4,000; C. R. Newman, house, south side of Matheson, $2,000; Dunn & Wallace, house, south side of Kylemore, $2,750; W. J. Baldry, house, west side Horner, $4,500; Mark Fortune, garage, north side Wellington crescent, $3,000.

Bell & Sleno, contractors, Montreal, Que., are stated to have dissolved.

A. King & Company, contractors, Montreal, Que., are stated to have dissolved.

F. Adam, Camrose, Alta., lumber merchant, is stated to have sold out to Globe Lumber Company, Limited.

The B. C. Gozette gives notice of the incorporation of the following company: B. C. Hydraulic Power Company, Limited, capital $10,000.

The B. C. Gazette gives notice of the incorporation of the following companies: [illegible] Sawmill Company, Limited, capital [illegible]; [illegible] Lumber Company, Limited, capital $100,000.

The incorporation of the [illegible] Pulp & Paper Company, with a capital stock of [illegible], head office, Montreal, and of the [illegible] Motor Carriage & Machinery Company, of Hamilton, capital stock, [illegible], are announced.

Tenders and For Sale Department

Province of Ontario

County of Victoria

Offers will be received by the undersigned until TUESDAY, NOVEMBER 15TH, 1910, for the purchase of debentures of the County of Victoria, to be issued December 20th, 1910, for the sum of $10,000, bearing interest at 4 per cent. per annum, payable in 20 annual instalments of $735.82 each. No offer necessarily accepted.

J. R. McNEILLIE,
Clerk and Treasurer.

Lindsay, October 26th, 1910. 44

Tender for Sewer

Town of Walkerville

Sealed tenders will be received by registered letter, addressed to the undersigned, up to noon on TUESDAY, 8TH DAY OF NOVEMBER, 1910, for the construction of a brick sewer on Windermere Road from Niagara street south to Grand Coulie Ditch, in the town of Walkerville.

Plans and specifications may be seen on application to Mr. Owen McKay, civil engineer, Walkerville, Ont.

Tenders must be accompanied by a marked cheque, made payable to the town treasurer, equal to 5 per cent. of the amount thereof.

Should any party whose tender is accepted fail to execute the necessary contract and bond for the due fulfilment of the same his deposit will be forfeited to the town.

Deposits of unsuccessful tenderers will be returned.

The lowest tender not necessarily accepted.

The names of two responsible persons willing to act as sureties must accompany each tender.

CECIL H. ROBINSON,
Town Clerk, Walkerville.

Walkervills, 24th October, 1910. 44

City of Winnipeg

Electrical Distribution System

Tenders for Wire and Cable, Poles and Line Supplies

Sealed tender, on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope, ''Tenders for Overhead Wire and Cables,'' will be received at the office of the undersigned up to 11 a.m. on MONDAY, NOVEMBER 7th, 1910.

Sealed tender, on prescribed forms, addressed as above, and marked on the envelope, ''Tender for Poles and Line Supplies,'' will be received at the office of the undersigned up to 11 a.m. on THURSDAY, DECEMBER 1ST, 1910.

Copy of specification and form of tender may be obtained at the office of Smith, Kerry and Chace, Carnegie Library Building, Winnipeg, Canada, or at the office of the firm in Toronto, Ontario.

Each tender must be accompanied by a certified cheque as set forth in the instructions to bidders, which cheque will become forfeit to the corporation under the conditions set forth in that document.

The city reserve the right to reject any or all tenders, or to accept any tender which shall appear advantageous to the city's interests.

M. PETERSON,
Secretary.

Office of the Board of Control,
Winnipeg, October 24th, 1910. 45

Silica Brick & Lime Co., Limited

By order of the Trustees under Debenture Trust Deed, Messrs. Stewart Williams and Company will sell by Public Auction, on SATURDAY THE 12TH DAY OF NOVEMBER, 1910, at 11 o'clock in the forenoon, at the Driad Hotel, Victoria, B.C.

The undertaking and all the property and assets of the Silica Brick and Lime Company, Limited, as a going concern, and which comprise in particular the Freehold Lands forming the Site of the Company's Brick and Lime works at Atkins Siding, Esquimalt District, B.C., and being part (24 acres or thereabouts) of section 105 and all section 113 (about 142 acres), Esquimalt District, and all Buildings thereon and the brick and lime making Plant, Machinery, Fittings, Stock in Trade, Tools, Implements and other Chattels and effects in, upon and about the said premises.

Further particulars can be had and conditions of sale seen on application being made therefor at the Company's offices, No. 512 Fort Street, Victoria, or at the offices of the auctioneers, No. 637 Fort Street, Victoria, B.C. 44

Tenders

Quebec Railway, Light, Heat and Power Company

SEALED TENDERS are requested from responsible contractors for the construction of an

Office Building

in the city of Quebec, for the Quebec Railway, Light, Heat and Power Company.

Also for the heating and ventilation of same.

For the plumbing system.

The electric wiring, lamps and lighting fixtures.

The passengers and freight elevators.

Plans and specifications for any and all of the above can be seen at the office of the undersigned architect, or may be secured for the purpose of estimating, upon the deposit of a sum of $25.50 as security for the return of the same.

All contractors tendering upon the above works must accompany tender with an accepted cheque, made payable to Mr. C. E. A. Carr, general manager of the Company, equal to fifteen per cent. (15 p.c.) of the amount of tender, which will be forfeited if any person tendering declines to enter into a contract as, and when called upon to do so, or fails to complete the work contracted for. If the tender be not accepted, the cheque will be returned.

Tenders to be written on a special form, prepared by the architect, must be enclosed in sealed envelopes, plainly marked on the outside and addressed to Rene P. LeMay, Architect, 21, d'Aiguillon Street, Quebec.

Tenders will be received until four o'clock p.m., FRIDAY, THE 4TH OF NOVEMBER, 1910.

The Quebec Railway, Light, Heat and Power Company reserves the right to reject any and all tenders.

By order,

RENE P. LeMAY, Architect,
44 21 d'Aiguillon St., Quebec.

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

WANTED, position as Superintendent of grading, rock work or concrete, experienced. Box 154 CONTRACT RECORD, Toronto, Ont. 44

New Companies

The Birtle Electric Power & Manufacturing Co., Ltd., Birtle, Man., capital $50,000. Incorporators, E. J. Wilson, printer; A. L. Spalding, contractor, and Lewis St. George Stubbs, barrister, all of the town of Birtle, Man.

The South Bruce Rural Telephone Company, Limited, Belmore, Ont., capital $10,000. Incorporators: Jos. Vogan, Jno, S. Inglis, and Jas. Hamilton, all of the County of Bruce.

John Martin Paper Company, Limited, Winnipeg, Man., incorporated, capital, $100,000. Incorporators: John Martin, manager; R. Hillier, secretary-treasurer, and S. R. Flanders, barrister, all of Winnipeg.

Tilly, McKinley, Norton Company, Limited, capital $100,000; incorporated to conduct a general wholesale and retail lumber, sand and gravel business.

The Dominion Roofing Company of Canada, Limited, Toronto; incorporated; capital $40,000. Incorporators: E. A. Maltby, C. J. Oilee and W. Maltby, druggist, all of Toronto.

The North American Furniture Company, Limited, Owen Sound, incorporated, capital $100,000. Incorporators: J. A. Minchner, Stratford, and J. G. Hay, Owen Sound.

Oakville Construction Company, Limited, Oakville, Ont., incorporated, capital $25,000. Incorporators: W. West, manager, and W. Scott, carpenter, Oakville; and A. E. Cook, painter, Toronto.

The Excelsior Lumber & Construction Company, Limited, Toronto, incorporated, capital $100,000. Incorporators: J. W. Heffernan, F. C. Carter and A. Fleishman, all of Toronto.

The Dupuis Pulp Lumber Company, Limited, Parish of St. Hermenegilde, Que., incorporated; capital $100,000. Incorporators: A. Dupuis, St. Hermenegilde; G. Langlois, journalist; A. Handfield, manufacturer; H. Sauriol, financial agent, all of Montreal.

The Macintyre Plastering Company, Limited, Montreal, Que. Capital, $10,000. Incorporators: R. B. Hutcheson, notary; A. Holden, A. Langlois, accountants, and F. L. Armstrong, engineer, Montreal.

The Manitoba Power Company, Limited, Winnipeg, Man., incorporated, capital, $5,000,000. Incorporators: H. A. Lovett, K. C., P. F. Brown and W. R. Ford, Montreal, Que.

Bold Glass Company, Limited. Toronto, Ont., incorporated, capital, $40,000. Incorporators: G. E. Gibbard and H. L. Yarnold, druggists, Toronto.

Steel and Radiation, Toronto, incorporated, capital $5,000,000. Incorporators: C. L. Dunbar, E. A. Dunbar and N. Jeffrey, Guelph, Ont.

Deguise & Richard, contractors, Montreal, Que., are stated to have dissolved.

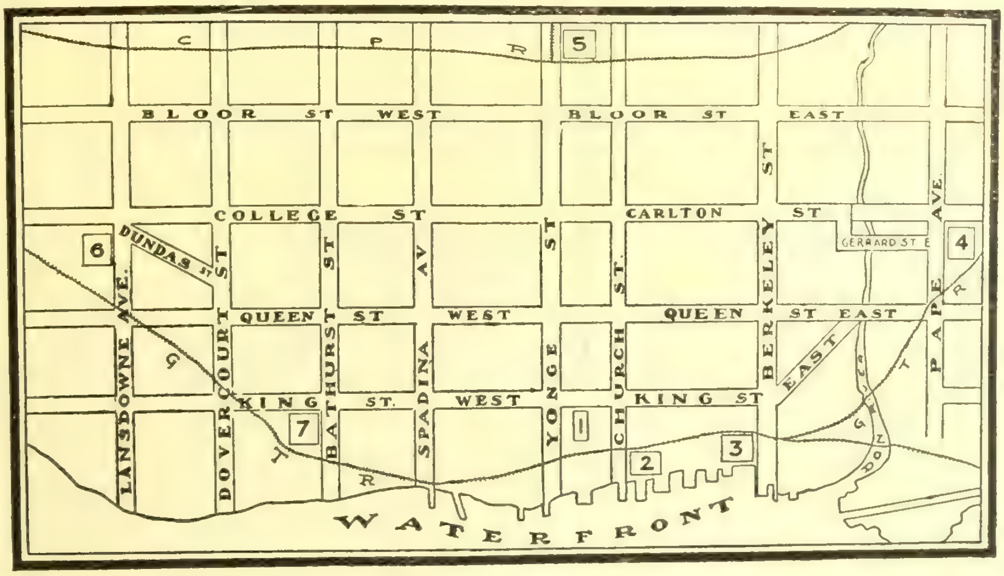
J. Grant & Company, Montreal, Que., builders, etc., are stated to have assigned.

The Arnold Electric Company, of Canada, Montreal, Que., are registered as M. J. McLaughlin & G. F. Pratt.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone Main 4155



No's 2, 4, 5, 6

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, **Toronto**

CONTRACTORS' PLANT

BOILERS

PUMPS

TANKS

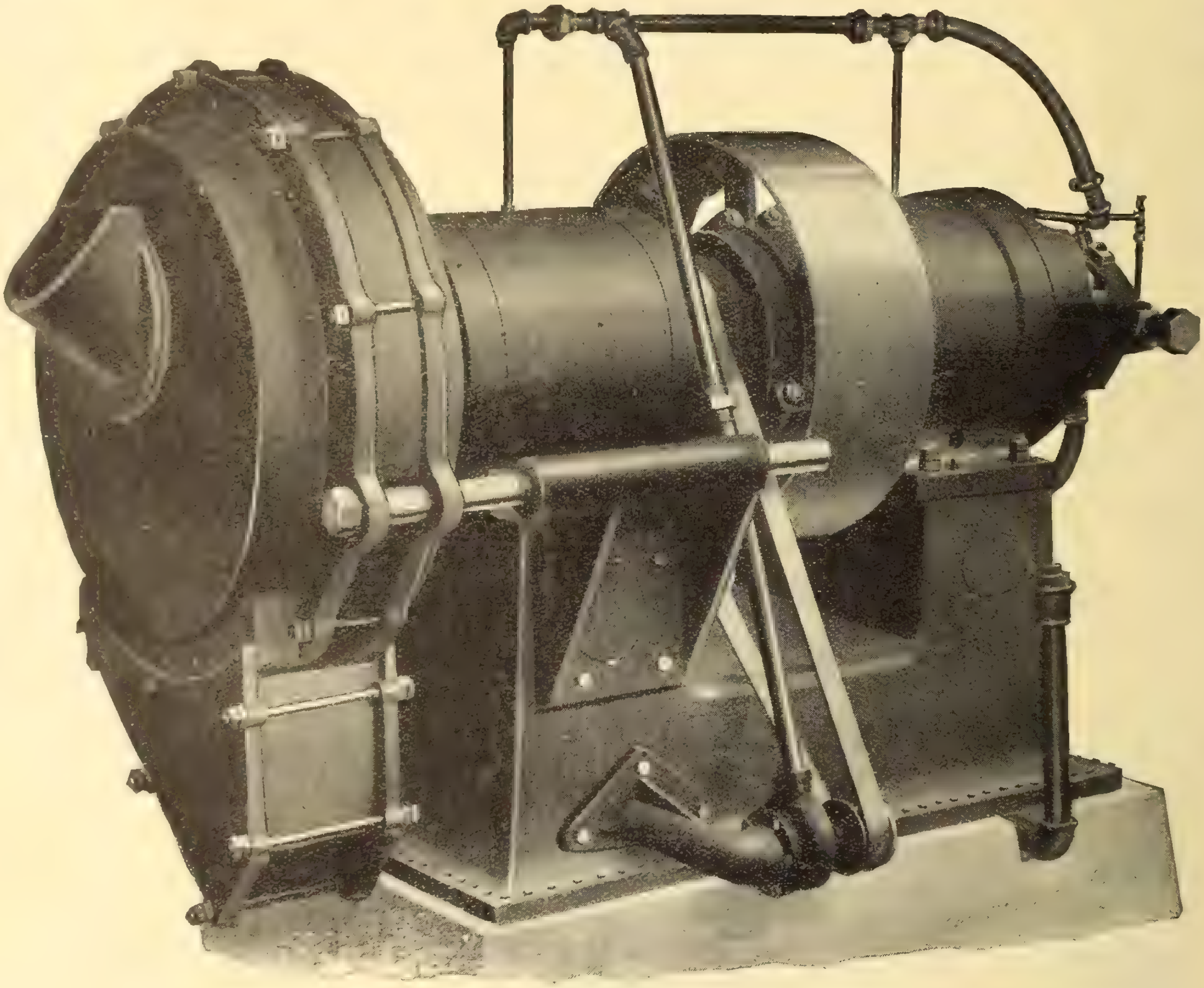
CONDENSERS

WORKS: MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

A New Princ



Sy

Cr

Look at

Takes large rejections or granite boulders and in one operation crushes down to any size—

The largest size takes 8 inch stone and makes any size down to 1-2 inch and less.

The medium size takes 4 inch stone and makes any size down to 1-4 inch and less.

The small size takes 2 inch stone and makes any size down to 1-8 inch and less.

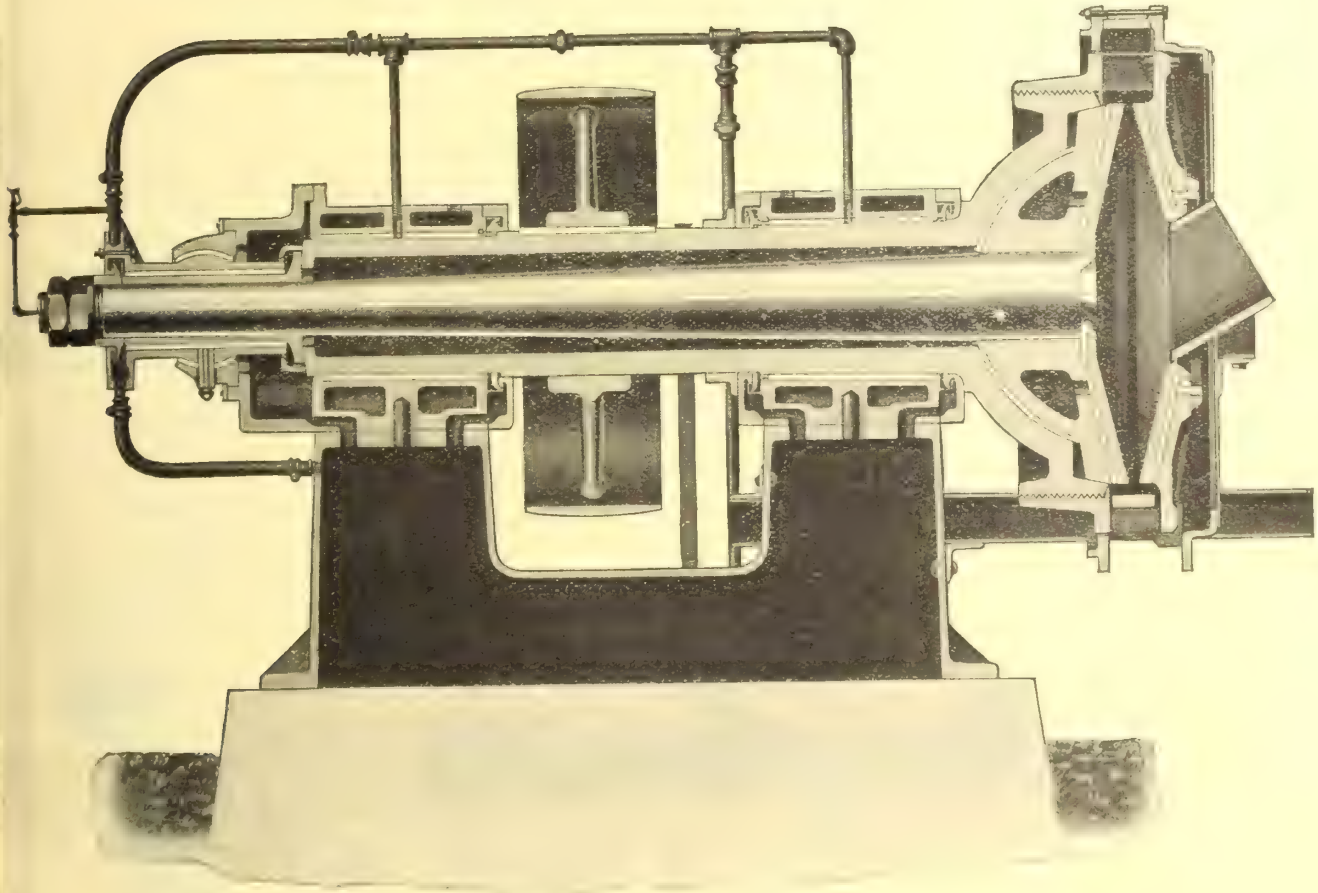
The Crusher has two Dish Shaped Manganese Steel Discs the hollow sides of which face eac other. These discs rotate in the same direction at the same speed. The stone is fed be

Head Offices and Warehouses :

Montreal

MUSSENS

e in Crushing



them through a central feed opening and is caught between them where they are
t apart, and carried around with them to where they are closest together being crush-
going halfway round. The smaller particles fly out during the next half round and
arger pieces caught again. The crushing movement may be regulated while the
er is running.

Let us send you full information. Free on request.

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden's Liquid Cement Filler

This material is of the consistency of putty and is especially intended for filling cracks and creaks in concrete and stucco work, also to prevent inroads of water and dampness.

LIQUID CEMENT FILLER is also intended for use as a waterproof cement for skylight work, acting as a waterproof cushion to take care of expansion and contraction.

Specifications:

Apply the Filler by means of spatula or putty knife, packing same firm into the cracks. Even up the surface and apply a coat of LIQUID CEMENT over the LIQUID CEMENT FILLER. The LIQUID CEMENT FILLER, if too heavy, can be reduced with LIQUID CEMENT.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio
Distributed in Canada by
Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

THE NORTHERN ELECTRIC AND MFG. CO. LIMITED FIRE-ALARMS TELEPHONES SUPPLIES

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 2016 - Type-Metal Inter-phone for desk use

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
J. R. HOOPER, Representative.
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto November 2, 1910 No. 44

The Evils and Ethics of Contracting

The ethics of contracting, and the alleged evils of the competitive bid system, provided the inspiration for an interesting discussion at a recent meeting of the American Society of Civil Engineers. One of the members of that body, who has the reputation for being an authority on contractual relations, discusses the matter in the following paragraphs. His ideas are interesting, particularly in regard to suggested expedients, but we cannot say that we share his convictions. In our opinion the average contractor takes a pride in doing creditable work. He realizes his obligations and tries his utmost to fulfil them. The writer in question says:

"Anyone familiar with contract work knows that a tremendous price is paid, in shoddy work, inefficiency, and moral diseases, for competition, and yet we are told that it is a sacred thing, and that absolute freedom of competition is necessary to progress. The writer freely confesses that he is a heretic. In the first place there never has been, and never will be, free and perfect competition. In the second place, it has already become necessary to substitute regulation for competition among the railroads, and it soon will be necessary to do the same thing with the trusts. It is perfectly true that, in the past, much progress has come through competition. In the same way, much progress has come through savage warfare, but it does not follow that price competition is necessary or beneficial to-day any more than it follows that we should throw away our government regulation, arbitrations, and courts of law.

"Of course, something will have to take its place. Most men still need a greater incentive to put forth their best efforts; but why not devise some method of securing a competition of excellence, instead of price? And such a method can be devised. The fee basis, modified perhaps so that profits below or losses above the estimated cost are shared in certain proportions, seems to offer a hint of the true method. The contractor is assured of a reasonable profit, and is also benefited by economy of operation. The interests of all parties are as near to those of the owner as it is possible to make them. The owner gets the benefit of the contractor's experience and equipment. The contractor has to depend on his reputation for honesty and efficient work, instead of a low bid, for getting his contracts, and, still more important, all parties can cooperate, after the contract is let, to obtain the best results for the benefit of all. Anyone who has done work fairly and honestly under this method will bear testimony to the way in which the difficulties, misunderstandings, and dangerous expedients vanish like mist before the sun. The expert or engineer of the contractor has a recognized standing at court. The designer is free to devote himself to the larger elements and relations of the work, and to avail himself of the full value of the expert services of the contractor or manufacturer, and the contractors will be selected because they are the best in their lines, and not because one happens to leave out enough in his estimate to make him a low bidder.

"The immediate self-interest of the owner, before the work is let, is to obtain the lowest possible prices by every means in his power, and after the work is let, to get as much as he can out of the contractor. The immediate self-interest of the designer is frequently to make the work cost as much as possible, and to slight it all he can. The immediate self-interest of the contractor before the work is let, is to underbid his competitors, and after the award, to get out as best he can. It is a state of war in which each party has many weapons, and neither can be blamed very much for using them. It is not much worse for the contractors to pool a job than for the owner or designer to play one bidder against another. Both are stratagems of war, and the only marvel is that things are no worse.

"A designer or an owner will often get a detailed plan of some part of the work from a contractor, cut off the name, and submit it to other contractors for bids. A contractor will frequently make use of his opportunities, when called into consultation by the designer, to load up the work so that he is able to underbid all competitors, and then cleverly unload again by offsetting one change against another, make a good profit, and perhaps do a most excellent piece of work where another contractor might have lost money.

"These are rather flagrant but none the less common examples. Going a step farther: How many engineers and how many contractors, do their work as though it were their own and they were doing it for themselves? How often one hears the question: 'Who pays for this? Is it lump sum or unit price? If we have to pay for it, we'll leave it out; if the other fellow pays for it, we'll put it in.' How many times does the designer refuse to allow or to make a desirable change in his plans for fear the contractor will make a little more money. How often does the contractor fail to call attention to changes or modifications in methods or plans which might benefit the owner or the work, because his own interest might suffer thereby. So it is all the way down the line, until one cannot help wondering what is really the matter."

The Training of the Engineer-Contractor

Is Adequate Attention Devoted by our Colleges to Methods and Cost of Construction? — Are we turning out Impractical Men?

By W. R. Harris*

Engineering has been defined as "The science of designing structure so as to resist the force to which they are subjected while performing their functions," and as "The art of so designing these structures that the interest upon their first cost, plus annual depreciation, plus annual operating expenses, shall be the least sum possible of attainment."

Engineering-contracting may be defined as the art of constructing structures at a cost closely approximating the original estimates for same. In short, an engineer-contractor should know what one dollar, either in energy or materials, will accomplish.

The time is passing when one can wait to obtain knowledge of engineering-contracting solely by personal experience. We must study the experience and results of others and those who reap the benefit of the experience of others are indeed fortunate.

The newly fledged graduate engineer is of small use to the contractor, for although he may be qualified to design structures, he is not always able to compute the quantities of labor and materials required in the proposed structure. He can very seldom suggest practical methods of operations, costs, etc., and hence, before he can attain to the position where he will be of much value to the contractor, he must pass through the school of experience.

It is possible to so arrange studies in engineering colleges that the graduate engineer will have some knowledge of engineering contracting such as to render his services of greater value to his employer.

An engineer or contractor is always judged by his experience, and if the student in college can gain some of this knowledge by instruction instead of experience he is saved just so many years of hard work.

A great many structures have incorporated in their design non-essential details which increase the cost of the structures beyond economic limits. This is caused by ignorance of construction methods and not by the desire to unnecessarily increase costs, hence a course in engineering-contracting will be of great assistance to an engineer as he would be able to omit non-essential details and to design his structure so that the minimum of energy would be expended in its construction. By non-essential details I do not mean the addition of lines that would beautify a structure where beauty is desirable.

Shortcomings of the "Theoretical Engineer."

An engineer instructed in simply the science of engineering, and one that the contractor usually refers to as a "theoretical engineer," would design a structure to resist certain forces and would probably not consider, due to lack of knowledge on the subject, that the contractor, to secure certain lines called for by the design, would expend more work than would be necessary by the modification of the design, which modification would not affect the ultimate strength. For example, I know of several instances in concrete design and construction work where by a slight modification in the angles and lines a better, cheaper, and more beautiful structure was obtained.

An engineer who is familiar with everything that enters into the design and construction of the proposed structure, whether it be a sewer, a building, a bridge, a piece of machinery, or what not, can produce better results than one who is simply trained in the pure theory of the science.

The question will naturally arise as to how such instruction can be imparted to the student, and I will attempt to suggest some idea which I hope will be productive of discussion and bring out other, and better, ideas on the subject. I believe that any department of engineering, whether civil, mining, hydraulic, mechanical, electrical, etc., can be so handled as to provide instruction in engineering-contracting as applied to any particular branch of engineering.

When the student arrives at that part of the course of study, embracing designing, he should be required to make up a schedule of quantities showing a bill of materials with market prices on same, and also to include in his schedule the estimate of labor required to construct, manufacture, or erect each item or group of items. He could give a statement of what, in his opinion, would be the proper crew and proper tools required in the construction of the work. He could also suggest a plan of operation for the construction crew.

Again, at the proper period of the course of instruction, plans and specifications of actual proposed work, preferably in the immediate vicinity of the college, could be secured and each student in engineering-contracting be required to make up a detailed estimate on the proposed work and to submit a bid on same. With his detailed estimate and his bid, he could present a detailed plan of operation, including the list of outfit, crew required, etc. He could also estimate the time required to complete the work or certain portions of it. Copies of the bona fide bids on which the contracts were awarded could then be secured and compared with the students' bids. Where the work was in the immediate neighborhood, students could be detailed to observe the operations, methods of working, obtain costs, etc., and report all of this back to the class.

Each student could spend a day or several days' time on this work, and another student take it up where the preceding student left off. The result of each day's operations could be reported the succeeding day in open class in a very few minutes. Such a course of procedure would not only develop the student's power of observation but would also place him in a position where he would be in actual touch with construction work.

All colleges have more or less construction work which in most cases they let by contract. Every student in the branch of engineering involved in each contract could make up a detailed estimate, bid, etc., as outlined above, and the same method of procedure adopted as to inspection, reports and discussion.

---

*Read before the American Society of Engineering-Contractors

I do not believe that this is practised in many colleges, at least I have never seen such a method of procedure adopted on any work on which I have bid. I know from my own experience that the study of any piece of work is of value to any engineer or contractor.

The most important part of such a course of study would be the open discussion in class of each day's work, methods, etc., as through discussion new ideas will be brought forth.

Value of Practical Knowledge.

I believe it would be easy to secure the services of practising engineers and contractors to lecture to classes in engineering colleges, and a few lectures from such men, engaged in actual work can be of inestimable value to every student in the class. Such lectures and discussions as would be produced by the system as outlined above would cause every student to consider plans and specifications from the view point of the constructor as well as from the view point of the designer.

The result of this could not help but eliminate unjust clauses in specifications, such clauses as would tend to increase costs without an adequate and necessary return in strength, beauty and utility.

The etihcs of engineering-contracting should be taught and discussed, as well as the ethics of engineering. Engineering students should be taught that contractors are "worthy of their hire," and that the contractor is entitled to a fair profit on honest work. He should be taught that it is fair to ask only for what is possible and to pay a price that is based upon actual cost plus a fair profit. He should be taught to specify good work and to require good work.

He should so draw plans and specifications that intelligent contractors could arrive at a clear idea of what is required as well as to conditions governing costs. He should be taught to conceal nothing regarding conditions that would affect the cost.

He should be taught to make specifications as brief and plain as is consistent with a clear explanation of what is requierd.

The student would learn to draw specifications that would be better than many now drawn, for by studying the specifications of public works, he would himself, when called upon to prepare detailed estimate of cost and bid on these specifications, realize the unfair features that many times enter into contracts, and having impressed upon his mind the effect on the cost by these unfair features his tendency would be to eliminate these features after entering into the business field.

An Illustration in Point.

I have recently had the pleasure of meeting an engineer whom every contractor termed a "crank." Every contractor, however, stated that he was absolutely honorable and absolutely just, although in many things not practical. I was told that the specifications would have to be fulfilled to the letter. This engineer, I do not believe, ever did any construction work himself, and hence there were certain impractical features in some of his work that increased the cost of his structures unnecessarily. In fact, I understand that he had spent many thousands of dollars, due to impractical ideas, but he always got what was specified and his work, though costly, was always good from an engineering standpoint.

This instance simply emphasizes the necessity of the engineer having a broad acquaintance with construction methods and costs, for I do not believe that engineer mentioned above had any idea that he was impractical in the slightest. I believe that he erred on the right side because every contractor who knew him figured absolutely on the specifications and took nothing for granted except what was specified. Therefore, every contractor figured on the same basis.

I also understand that the inspection on work under this engineer's charge is very rigid, but that the contractor is never called upon to do anything not specified in his contract.

It would be very much better if all engineers would consider a structure from both the standpoint of the constructor and the engineer, and then see that the specifications are obeyed strictly.

New Appliances—New Methods.

The engineering-contracting student should familiarize himself with tools and appliances used in work coming within his branch of engineering, and to this end every college should have a catalogue library, properly indexed. Each student should study the advertising columns in technical papers and should request such catalogues as interest him and place same in the catalogue library of the college, for many times new methods are suggested by new appliances.

The student should be taught to think of actual work, first, as so much human energy expended in periods of man-hours, whether this energy is utilized by men with the pick, shovel, or other hand tool, or by means of the steam shovel, crane, or other piece of machinery.

After the student learns that a gang of a certain number of men will accomplish with a certain tool so many units of work by the expenditure of so many units of energy, he will be able to approximate closely similar work in any part of the country no matter what the cost of labor, tools, and materials may be, provided he is acquainted with the local cost of same.

All the theory of design ever taught will not help the student to arrive at the man-hours required to excavate earth, rock, etc., nor will it show him the difference in man-hours required per unit of sand, clay, loam, gravel, loose rock, solid rock, in open cut, nor the difference in energy expended per unit in tunnel or in shaft.

This can only be guessed at by the ordinary engineering student, but it can be more nearly approximated by the same student after he has studied work near him and after he has, by actual observation, obtained some data along these lines. Such observation and study of the work near him will enable him to study with intelligence cost data compiled by engineers and contractors on work that may be done at a distance remote from the college.

I know that many contractors have been disappointed in the work rendered by graduates of engineering colleges, and I believe that graduates who have taken a course in engineering-contracting will be more gladly received by the constructors as well as by the engineering fraternity.

The above statement may be somewhat crude in its presentation, but this is such a broad subject that it cannot be properly handled by one man in one article, and I trust that what I have said above will be productive of discussion among our members, and that it will bring forth ideas that will assist in starting the establishment of a course in engineering-contracting in some of our engineering colleges.

The Contract System Versus Day Labor

Epitome of Boston Finance Commission's Report[*]—Comparative Costs—Significant Conclusions—Interesting Criticisms of Discussion by Readers and Contemporaries

Among the various lines of investigation carried out by the late Boston Finance Commission were several which threw considerable light upon the relative efficiency of the contract and day-labor systems and some of the causes of the inefficiency of the day-labor forces of the city of Boston.

An effort was made to ascertain as nearly as possible the actual facts in all cases, and to reduce the conditions to figure, thus eliminating opinions. The results of these investigations are, therefore, interesting and important, as showing the results of conditions surrounding city departments, and not as exploiting theories of ideal conditions which are rarely found in any city.

While most of the data refer to the city of Boston, it is believed that the lessons drawn from them are typical, and that similar results would be obtained from like investigations in many other cities.

Comparative Costs of Day-Labor and Contract Sewer Work in Various Cities.

A comparison was made of the cost of building sewers in cities where work was known to be done by day-labor with that in other cities where similar work is done by contract.

Average Total Cost Per Foot of Comparable 12-inch Sewers Laid 10-Feet Deep in Various Cities.

"A" Built by Day-Labor.

City or Town	Prevailing diameter of sewer (Inches).	Actual total cost per foot.	Total cost of equivalent 12" sewer without allowance for difference in wages	Subdivision of cost into Labor and teaming only.	Material and sundries.	Engineering.
Brookston	8	$1.73	$1.96	$1.20	$0.68	$0.08
Cambridge	8	2.35	2.58	1.70	0.81	0.07
Everett	8	2.09	2.32	1.55	0.68	0.09
Fitchburg	12	1.80	*1.80	0.95	0.77	*0.08
Havenhill	10	1.68	*1.80	0.90	0.82	*0.08
Lawrence	10	2.38	*2.50	1.80	0.62	*0.03
Lowell	10	2.30	3.42	2.35	0.98	0.09
Medford	8	1.80	2.03	1.05	0.92	0.06
New Bedford	10	1.88	2.00	1.30	0.67	0.03
Newton	8	1.65	1.88	1.05	0.73	0.10
Quincy	8	1.54	1.77	1.00	0.68	0.09
Worcester	10	2.00	**2.00	1.20	0.70	0.10
Average	....	....	$2.17	$1.34	$0.75	$0.08
Boston	12	‡$5.20	$5.20	†$3.50	$1.55	$0.15

*Engineering estimated $0.08 per ft.

**Exclusive of office and shop charges as in other cities.

†Owing to the fact that this figure is based upon a comparatively small number of examples, it should be used with caution.

‡Not including proportion of undivided construction cost which amounts to about 5% of total construction cost.

"B" Built by Contract.

City or Town	Prevailing diameter of sewer (Inches).	Actual total cost per foot.	Total cost of equivalent 12" sewer without allowance for difference in wages	Subdivision of cost into Labor and teaming only.	Material and sundries.	Engineering.
Brookline	8"	$1.73	$1.95	$0.80	$0.80	*$0.25
Portland	10"	1.50	1.62	0.65	0.81	*0.16
Providence	12"	1.68	1.68	0.65	0.83	*0.20
Somerville	8"	1.75	2.05	0.90	0.91	*0.24
Average	....	....	$1.82	$0.75	$0.86	$0.21
Boston	12"	$2.35	$2.35	$1.05†	$0.90	$0.40

*Engineering and inspection.

†Advertised contracts only.

Note: That *no correction has been applied on account of differences in wages.*

Note: That the *day-labor* cost shown in column 4, includes labor on manholes, whereas the *contract labor* does not include this, but does include loss [illegible] sheeting, which substantially offsets it.

To make this investigation less difficult and reduce the element of uncertainty as much as possible, the inquiry was confined to small pipe sewers from 8 inches to 12 inches in diameter. Since most sewers of this class built in Boston have been constructed under contracts largely "gift" or non-competitive contracts), the number available for comparison was smaller than desired. As the difficulty in selecting work done under comparable conditions was fully realized, and as such selection could only be made by engineers familiar with local conditions, an assistant was sent from place to place to interview the local engineers, who always very kindly, and at times at considerable inconvenience to themselves, carefully considered the conditions surrounding a large number of pieces of work, and advised which should be selected for use in this comparison. The number of sewers selected in each city was small, but included all which could be classed as being built under conditions enabling fair comparison within the last few years. While it is realized that this study may be criticized as being based upon fragmentary and possibly insufficient data, it is presented as comprising the last data which could be obtained after a long and earnest effort to get at the truth. Unfortunately, in no city except Boston was this class of work found to be done both by day-labor and by contract, so that comparisons between the two methods in the same city were impossible, with the single exception noted.

These investigations were made in 17 cities, 13 of which do their work by day labor (including Boston which does part of its work by day-labor and part by contract), and 5 (including Boston) which do the work by contract. The average cost of building 12 inch sewers in 12 cities was found to be $2.17 per linear foot, while in the city of Boston similar work appeared to cost $5.20 per linear foot. Like work done by contract was found to cost on the average $1.82 in four cities, while in Boston it cost $2.35. The average cost of labor and teaming in cities, exclusive of Boston, where the work was done by day-labor, was $1.34 per linear foot, while in the four cities doing work by contract this cost averaged $0.75 per linear foot. Upon that done by day labor in Boston it was $3.50 per linear foot, while upon that done by contract it was $1.05 per foot, a reduction of 70 per cent.

The cost of sewers built by day-labor (not including Boston) averaged for labor $1.79 per linear foot, while in the cities doing work by contract (excluding Boston) the average cost of labor was $1.17. Treating in the same manner similar work done in Boston by day-labor and by contract, it is found that the labor cost was $3.50 and $1.32 per linear foot, respectively. It, therefore, appears that had the rate of wages been uniform in all cities the labor cost of the work done by contract would have been 35 per cent. less than the labor cost of that done by day-labor, not including Boston in this comparison. Comparing the work done by both methods in the city of Boston, it apepars that had the work done by day-labor been done by advertised contract the reduction in the cost of labor would have amounted to over 62 per cent.

Comparative Cost of Sewers built by Day-Labor and by Contract in Boston.

The costs of eight pairs of sewers, so selected as to be as nearly comparable with each other as possible, have been compiled. In each pair one sewer was built by day-labor, and one by contract. The pairs were selected by engineers employed by the city, who had direct personal knowledge of the conditions under which the work was done. After reducing the costs to equal terms as to size, depth and wages, it appears that in the case most favorable to day-labor the cost of the sewer built by direct labor was nearly double that of the one built by contract, while in the case of the pair most favorable to the contract system the one built by day-labor cost nearly four times as much as the one built by contract.

---

[*] Prepared by Harrison P. Eddy, Consulting Engineer, Boston.

From the information available, it appears that this study of cost and efficiency is based upon very full and reliable data, and that comparison from year to year can be fairly made, although of course a better and safer result may be obtained by averaging several years, and making a comparison on that basis. In whatever manner the comparisons are made, it is apparent that the efficiency of the day-labor force has dropped about 50 per cent. in the last 12 years. In other words, in 1907 the average employe did only one-half as much work in a given length of time as he did in 1895. In this connection it should be remembered that there are many causes for this decline in efficiency, some of which are entirely independent of the personal effort of the laborers, and for which they should not be held in any way responsible. It is also true that this decline is not necessarily an inherent result of the operation of the day-labor system, and that system has been in use in other cities for many years, where a decline of such proportions is not apparent.

Efficiency of Labor and Rate of Wages Paid.

An effort was made to ascertain the prevailing rate of wages paid by contractors in the vicinity of Boston for work similar to that performed by the city Water and Sewer Departments. Data were obtained from 35 different contractors.

The minimum rate of wages paid in this vicinity appears to be $0.15 per hour, and the maximum did not exceed in any case $0.30 per hour. Comparatively few laborers are employed at rates of pay exceeding $0.25 per hour, while large numbers are paid as low as $0.20. In general it may be stated that English-speaking laborers are paid more than others, and further that the rate of $0.30 applies quite generally to building laborers or to laborers who possess rather more than average skill. In no case was it found that laborers were paid for legal holidays, and only in two instances were Saturday afternoons allowed. None of the contractors gave Saturday afternoons off with continued pay, and in no case were laborers paid in event of absence from work on account of injuries received.

The contractors furnishing data to not "carry" their employes through the winter unless they have work which must be done. In other words they do not "find" work for their laborers during the winter season as do the city departments, and consequently they do not give continuous employment.

From a comparison of the wages paid by contractors and by municipalities, it is evident that city laborers are paid considerably more than laborers employed by contractors, and that they work fewer hours per week. It is difficult to determine the relation existing between high wages and the efficiency of the employes. It is doubtless true, however, that higher wages are paid by municipalities very largely because of political influence.

From this tabulation it appears that the hourly wage, making due allowance for the Saturday afternoons and holidays, has increased from $0.175 to $0.315, an increase of 80 per cent. in the cost to the city for the work done, assuming equal efficiency. In this connection it should be noted that while the cost of labor to the city has increased 80 per cent. per hour, the increase in daily wages received by employes has amounted to but 28 per cent.

It is further important to note that while the cost per hour to the city for labor has increased 80 per cent., the efficiency of labor, as already shown, has fallen 50 per cent. In other words, a dollar's worth of time in 1878 would to-day cost the city $1.80, but the efficiency having dropped 50 per cent. the city is obliged to pay $3.60 for the amount of work done in 1878 for $1.00, an increase of 300 per cent.

While it may not be fair to draw the conclusion from these figures that labor is less efficient because of higher wages, it does seem to follow that higher compensation does not assure greater efficiency. The greatest efficiency was apparently obtained in the case of the city of Brockton, where the nominal wage is $2.25 per day, although in Boston, where the same nominal wage is paid and holidays granted in sufficient number to increase the rate per hour over 12 per cent., the lowest efficiency was indicated. Averaging the results obtained in cities paying the same rate of wages, there appears to be a gradual decrease in efficiency as the rate of pay increases.

Holidays and Sick-Leave.

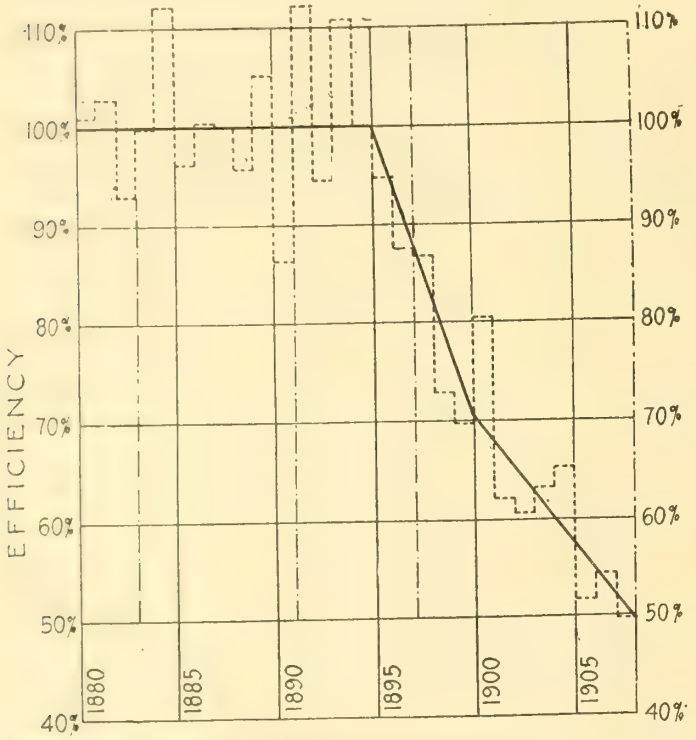
The effect of political influence is shown very clearly in the granting of holidays and sick-leave with pay to city laborers. The cost of holidays, half-holidays and sick-leave is an item the magnitude of which is not very generally appreciated. The Boston water department has very carefully compiled statistics relating to this source of expense. During 1906 the distribution division expended upon pay-rolls about $450,000, and the amount charged to holidays, half holidays and sick-leave amounted to over $34,000, or 7.7 per cent. of the total pay-roll. The lowest percentage for any month was 5.3, and the highest was a little over 10 per cent. of the respective pay-rolls. During the first eight months of 1907 the money paid for holidays and sick-leave amounted to 8.3 per cent. of the total cost of labor. During this entire period of 20 months the pay-rolls amounted to $752,000, and nearly $60,000, or 7.95 per cent. of the amount of the pay-rolls, was expended for holidays and sick leave.

Age of Laborers.

Perhaps one of the most frequent criticisms by the public of day-labor departments is that the men employed are too old for the work they are required to do, and consequently that the amount of work done per man per day is ridiculously small. This appears to be the universal opinion, and unfortunately in many cases there is much to substantiate it. An investigation of the Boston sewer department furnishes considerable interesting information pertinent to this criticism. Of the employes of this department the investigation included 715 connected with the labor service. The ages of the various employes, as well as their terms of service, were obtained from the state civil service records and are classified in tables 8 and 9.

Considering these tables as of the date of their preparation (1907), it is found that of the 65 men who were from 60 to 64 years of age, four had seen less than 5 years' of service in the department, six had seen from 5 to 9 years' service, 20 between 10 and 14 years, 28 between 15 and 19 years and only [illegible] served the department 20 years or more. Of the 21 men from 65 to 69 years of age two had worked less than 5 years, two others from 5 to 9 years, six from 10 to 15 years, five from 15 to 20 years, and only six had been employed in the department 20 years or more. Of the nine men from 70 to 74 years old two had labored from 10 to 14 years, four from 15 to 19 years, and three only for 20 years or more. There was one man over 75 years of age and he had labored 40 years or more for the department. Sixty-one (9 per cent.) of the 715 employes had worked 20 years or more. There were 97 employes over 60 years of age, but only 18 of them (18.5 per cent.) had served the department for 20 years or more.

Many will maintain, and with much justice, that men who have worked for the city for 20 years are entitled to consideration, but from the following statement of facts it appears that few are in need of charity. Of the 56 men who were over 40 years of age, and who had served 20 years, nine were employed as watchmen, which work they could perfectly well do. Four were filling positions for which they were not suited, and three were filling absolutely useless positions, leaving 40 men out of 56 men who were performing laborious work. Stating this matter in a different way, it appears that out of 715 laborers there were only 16 who were 40 years of age or older who had served the city 20 years and who were incapacitated for laborious work, and of these 16 nine were able to serve as watchmen. This condition leads to doubt as to the necessity for establishing a pension system for the labor force unless such system is to be established for the benefit of employes who have passed their years of usefulness in the service of other employers and who have late in life received, probably through political influence, positions upon city work.



Efficiency of labor in Boston water department—The average efficiency for the past 15 years 1880-1894 has been taken as 100%—Data for this diagram have been reduced to a uniform basis of wages and hours for the entire period.

The policy of appointing men upon the labor service after they have passed their years of usefulness in the service of other employers had turned the department into a semi-charitable institution, where aged and infirm men were employed when they should have been the charges of relatives or of the public, and not placed upon the city pay-rolls at wages higher than first-class able-bodied laborers at similar work could command from other employers.

Experiment to Test Efficiency of Day-Labor Force.

All of the work upon which the previous comparisons and comments as to efficiency have been made was work done prior to the investigations, which were consequently studies of records of work already completed. It was not, therefore, possible to know accurately the conditions under which the work was done. At the request of the mayor of Boston a test was made at the Chestnut Hill stone crusher (a municipal plant which had been shut down) to determine whether or not it was possible for the day-labor force to produce broken stone at a cost fairly comparable with that of similar stone purchased by contract. The test covered a period of three months during the summer of 1908, and was under the observation of a disinterested engineer, who kept accurate record of what was done, but who did not in any way supervise or direct the forces. The work consisted of stripping and quarrying the stone, hauling it to the crusher and breaking it.

The test lasted a sufficient length of time to demonstrate with accuracy the cost of producing broken stone by day labor under the existing conditions. The force consisted of men apparently as skilled and competent as could be selected from the employes of the street department and certainly gave evidence of being reasonably skilful and competent. So far as will be observed, the foreman in charge was given an absolutely free hand to organize his force as he deemed best, and to adopt such methods of handling the work as he might desire. With slight and unimportant exceptions, tools and supplies were promptly furnished, so that there is no reason to think that the output could have been increased by the improvement of conditions depending upon the co-operation of the superior officers of the department. The net result of this test appears to be that broken stone was produced at a cost of $1.075 per ton. These figures make no allowance for the cost of clerical service at the office or for the cost of administration, which items are estimated at $0.05 per ton; and no allowance was made for the cost of the quarry. Depreciation of plant and the rental of tools were included in the cost of producing the stone.

The quarry and crusher selected were the most favorable of any of the eight which the city had worked in the past, and in 1895 produced broken stone more cheaply than any other of the city crushers. It is only fair to add that during the second and third periods of the tests, the time being divided into three periods, there was a marked increase in the efficiency of the force. A fair estimate of the cost of the output of broken stone during these latter periods was $0.95 to $1.00 per ton, no allowance being made for administration nor for owning and maintaining the quarry. For comparison, an instance was found where the operations of a large broken-stone company were started with certain temporary machinery which was rented to a contractor, who crushed stone for a period of four or five months. The physical conditions were fairly comparable with those at the Chestnut Hill plant. The crusher was similar, the output smaller, and rental was paid for the machinery. The cost to the contractor for this work was $0.45 per ton, not including interest and depreciation, which would bring the cost up to $0.50 per ton. It therefore seems fair to conclude that the work which cost the city practically $1.12 per ton, including administration expense, would have cost a competent contractor about $0.50 per ton.

Resume.

While the difficulties of such investigations are many, it is believed that the results recorded represent very conservatively the conditions existing. It is apparent that municipal work done by day labor is in general, under the conditions of to-day, much more expensive than similar work done under the same conditions by contract. It is also apparent that the labor force in city departments where work is done by the day-labor system is very inefficient as compared with similar forces employed by contractors and has, during the last ten of fifteen years, decreased greatly in efficiency, at least in the city of Boston.

Is Labor Working for a City More Efficient than Labor Working for a Contractor?

The city usually pays more for its supplies and labor than a contractor, but the greater efficiency of its labor under proper supervision, and due to the higher wages, affects to some extent this handicap.

The above statement extracted from a letter to the "Contract Record," written by Mr. George Powell, principal assistant city engineer of Toronto, and published in our issue of September 28, provides Engineering-Contracting, of Chicago, with the inspiration for some interesting criticisms in a leading editorial. Our American contemporary makes the following pertinent observations:

"We quote the above statement because it is unique among reasons for doing public work by day labor. Saving the contractor's profits, better work, avoidance of law suits, employment of local labor, adaptableness to changes of plans have all been named by advocates of day labor as reasons for its adoption. The claim that labor working for a city is more efficient than labor working for a contractor has not, however, come to our notice previously. Were the author of the quotation an American we should set him down as a bit of a wag, but he is Canadian and, as we happen to know, is very serious in his assertion. Therefore, and also because be have examined at various times the other claimed advantages of day labor and work and may as well exhaust the list, we shall give this new claim attention.

"Looking at the question the strict logician might urge that it begged the question—'proper supervision' including only such examples as affirmed the assertion. What the author really means by 'proper supervision' is no more, we imagine, than honest and capable supervision. His assertion then is: Given honest and capable supervision, labor working for a city is more efficient than labor working for a contractor because the city pays higher wages. Let us look at this statement in the light of reason and experience.

"It is a reasonable assumption that better pay should bring better work, but experience proves that the one does not always follow the other. Under modern industrial conditions wage rates are the result of so many complex forces that they have ceased to be indices of the degree of efficiency of labor. We do not, however, need to depend upon abstract reasoning; there is the evidence of actual experience. American cities generally pay higher rates of wages than do contractors. This is undoubtedly true where account is taken of sick leave, holiday and vacation allowances of time under pay, which are universal in city work practice. Yet the investigations of the Boston Finance Commission's engineers showed that labor working for a city was decidedly inefficient. It was shown that not only was the unit cost of say sewer construction by city labor greater but that city laborers did not, man for man, lay as many bricks per day as did contractors' laborers getting smaller wages. Substantially the same results were disclosed by the engineers of the Chicago Commission on City Expenditures. And there have been a score of other examples mentioned in these columns during the past eighteen months. So common is this experience that the inefficiency of labor working for a city as compared with labor working for a contractor or a private corporation is almost a by-word.

"The pertinence of this evidence can of course be denied: It is excluded, it may be claimed, by the proviso of 'honest and capable supervision.' It is not, it may also be said, the experience of Canadian cities. There is doubtless a point to these claims. Canadian experience with day labor work, while not wholly familiar to us, does, we are inclined to believe from what we know, afford greater justification of the system than does American experience. The Canadian city, we know, goes about its task in a different manner from American cities. For any piece of work plans and specifications are prepared with care and on these bids are asked and the city engineer puts in a bid in competition with the contractors who may bid. If the city engineer's bid is lowest or is low enough to make it seem to the city officials most economical of all the bids, he is 'awarded' the work and prosecutes it with city plant and forces. We are not certain that this is universal practice but it is frequent practice and it has decided merits if we may judge from reports. Apparently, too, Canadian cities are exceptional also for an absence in their public works of politics of a certain kind familiar in American cities. It may be admitted that these conditions count for efficiency in day labor work; labor working for a city where they exist will doubtless be more efficient than labor working for a city where they do not exist, but the question of the comparative efficiency of labor working for a city and labor working for a contractor is not answered.

"The statement that labor working for a city is more efficient than labor working for a contractor is certainly contrary to experience in American cities. It is contrary to reason to expect that it can as a general proposition be otherwise. There is something more than honest and capable supervision required to put the city manager on a parity with the contractor in securing efficiency. Unless the city's manager has been a contractor he seldom has the training and experience of the contractor. If his training and experience are equal he does not have the incentive that the contractor has to wrest efficiency from his men. The contractor is impelled by the incentive of monetary reward; every extra fraction of efficiency he gets is money in his pocket and every fraction that he loses is money out of his pocket. No mild desire of the city manager to 'make good' can equal this incentive of financial reward or failure."

Letters to the Editor

Toronto, Oct. 26, 1910.

Editor, Contract Record:

Mr. Powell, in his letter defending the day labor system, says that the contractor and the engineer bid on even terms, and that the engineer allows for all contingencies which a contractor has to meet.

Such as far from being the case. In the first place, a contractor has to guarantee his work from one to five years. Ask any contractor and he will tell you that a considerable amount is spent in the way, no matter how [illegible] He can not tell accurately what the job will cost him until the term of guarantee is up. Does the city engineer allow for the cost of guarantee? No; any repairs he has to make to a job come out of the general tax fund. This is not only unfair to the contractor, but to the taxpayer also. Suppose, for instance, that a contractor were to lay a pavement on Yonge street and the engineer another on King street. The [illegible] paving Yonge street, the contract price of which is charged to the occupiers on that street, and includes repairing for five years; but the general taxpayers have to pay for repairing King street, in order to show an imaginary profit for day labor work.

Mr. Rust says the by-law will not permit him to allow for the [illegible]. Why does he not state that in his report when he is calculating the profits of the year?

The city of Toronto has purchased an asphalt plant and about a half dozen storage yards. These were purchased because of the increase of work done by day labor, but the cost of purchasing them or maintaining them is not charged against any job; it comes out of the general fund. $20,000 a year would not pay for maintaining them! This amount would not be required if it were not for the engineer doing the work by day labor. Such items as office expenses, employers' liability insurance, and legal expenses, which run into a considerable sum, are not included in the engineer's cost.

Yours sincerely,

AN OLD CONTRACTOR.

Montreal, October 24, 1910.

Editor Contract Record:

I wonder how many business men, or, for that matter, common sense men of any calling, Mr. Powell expects to convince by his letter published in your issue of October 12.

The engineer's honesty in carrying out day labor work, either in regard to the making of the estimate, or in the choice of materials that he uses in carrying out the work, is not questioned, but it is clear that his views are more likely to be biased if *seemingly* cheaper work (apart from the real cost) means more consideration and more pay for him.

That the foreman's interest is to scamp the work on his own responsibility, as long as his credit increases by it, is also too evident to discuss.

But Mr. Powell gives the greatest swing to his imagination when he writes: "The engineer is, of course, anxious to do his own construction work, and, with the facilities that can be provided by the city in the way of plant, he is unquestionably able to compete with the contractor on even terms. The city usually pays more for its supplies and labor than a contractor, but the greater efficiency of its labor under proper supervision, and due to the higher wages, offsets to some extent this handicap." In Montreal the contractor is now required to pay a minimum wage of two dollars per day to laborers, with the same working hours as the city. For *good* men, he will have to pay *more* than the minimum. The city also pays two dollars, but this is a maximum as well as a minimum, and the contractor's wage is, on the average, the higher. Yet with the same working hours and a higher wage, the average Montreal laborer keeps clamoring for the abolition of contracts, because he is sure to more than make up by working less, and cornering the labor market sooner or later.

Then, where does the "greater efficiency," which Mr. Powell speaks of, come in? I, myself, have had some experience in street construction work, and after reading the controversy in your paper I find unshaken the following points, made by the advocate of contract labor:

1.—The city engineer has no taxes, no office rent, no water rates, nor any other general expenses to pay.

2.—The city engineer gives no bonds, or guarantee, and his work has to be repaired at the city's expense.

3.—The city engineer lacks the practical experience of the average contractor.

4.—The city engineer and his subordinates will be tempted to scamp in order to boom their stock, and the controllers or aldermen will be tempted to approve of the scamping because of the patronage involved in day labor.

Mr. Powell contends that "all the contingencies for which a contractor has to provide are included in the city engineer's figures" and that, therefore, "the bid is on even terms," but I challenge him to quote one single instance where the general expense item—which, of course, directly or indirectly, the city, like the contractor, has to pay—has not purposely been left out of the city engineer's estimate to make his figures more acceptable!

As regards scamping, it can be practised by the contractor with the assent, perhaps, of incompetent officials, but then, will these same officials be more honest or more competent when working on their own account? Contract work has this at least in its favor, that the contractor is under check, while the city engineer is his own supervisor.

I may add the following notes from my own observation and experience:—

1st.—Day labor excludes competition; therefore it means less work and poorer work.

2nd.—The city engineer has a tendency to base his figures not on the actual cost, but on the wishes and whims of his employees, his first care being to hold his job.

3rd.—The private citizen cannot ascertain the real cost of day labor for the reason that the bookkeeping will be made to fit in with the game of patronage.

To summarize: even with the best of intentions, the city engineer cannot carry out the work with the same thoroughness that he can supervise it.

Very truly yours,

CONTRACTOR.

Editor's Note.—"Contractor" would appear to have had a somewhat bitter experience in the business. This doubtless is accountable for the feeling of intolerance for the day labor system communicated by the above letter. The reader must not overlook the fact that "Contractor" belongs to Montreal, a city with a past, in so far as the question under dispute is concerned.

Earth Roads in Ontario

Mr. W. B. Rittenhouse, of Beamsville, Ont., writes suggesting that pressure be brought to bear upon the Provincial Government in order to secure assistance in the work of building and improving earth roads throughout the province. He states that in spite of the efforts of the various associations the grants for highway improvements have not been increased. Mr. Rittenhouse thinks that there should be an apportionment for earth roads. "We must expect to have many miles of these earth roads for many years yet," he writes, "and they are deserving of being maintained in the best possible condition." The possibilities of road improvement have been discussed for many years but financial encouragement should be given by the Government. Mr. Rittenhouse concludes by emphasizing the importance of giving the farmer practical instruction in earth road building and maintenance, and suggests that a competent official be appointed to give such instruction, the idea being suggested by the excellent results that have been accomplished in this way, but in a wider sphere, by the provincial highway department.

Surety Bond for Architects

An ancient and unrepeated law has been unearthed in a California town which stipulates that competing architects in a competition, shall file a surety bond, prior to being paid anything for plans and specifications. The law was drawn for a time when the plans were furnished by the man who put up the building, and was intended to afford a protection to the owner under those conditions. Architects are on a different plane and under different methods now, and a number declined to enter the competition, because of the conclusion of the districta ttorney that this forgotten law should be followed. Yet architects are not wholly free from some sympathy with the requirement, or rather with the suggestion, that an architect should be held to some sense of responsibility as to plans which are offered on the basis of a certain cost. It is no uncommon thing for architects to declare competitions have been awarded on the basis of a plan which was far in excess of the expressed limit of cost, and that the intended building could not be brought within the limit of cost without a material alteration of the plan. And occasionally the outcome justifies the claim. It is not unknown by any means, for a plan when figured, to sadly overrun the limit of cost, and many a perplexed building committee has been at a loss to know what to do or where to turn for a solution of the problem of erecting the building which has been selected. In public and semi-public buildings, a committee frequently finds its position a most unpleasant one, for the design has been generally displayed and approved by the public, and any marked deviation therefrom, will arouse more or less discussion and criticism. Under these circumstances, it sometimes happens that the contractors afford a convenient scapegoat, and are accused of having formed a combination, to maintain high prices. Rejection of bids and refiguring, either upon the same plans or a revised plan, generally establishes about the same situation—that the prices quoted represented the views of contractors fairly.

It is not fair to charge the blame wholly to the architect, even under these conditions. The desire of so many building committees, boards and others, to get all they can for their money, presents a very strong temptation to present an alluring sketch in the competition. The architect who presents to such boards the sketch that they desire, is not doing more than going after the business, even though it does involve submitting a design which can only come within the limits of cost by the interposition of providence or the prevalence of an insane benevolence on the part of contractors.—*Improvement Bulletin.*

Notable Reinforced Concrete Arch

There is now under construction at Weston, Ont., what is, up to the present time, the longest arch span in Canada. An old wooden bridge is being replaced by a reinforced concrete arch of one hundred and eighteen feet six inches span. The illustration shows the falsework for the two arch ribs. The design is for an open-spandrel arch, the ribs being four feet six inches by four feet at the skewbacks, and three feet by four feet at the crown. The rise is sixteen feet and the roadway sixteen feet clear width, is on a six per cent. grade. The extreme length of the bridge is 178 feet. The abutments are carried to rock. The work is being done by the County of York, by E. C. Lewis, contractor. The engineers are Barber & Young, Toronto.

Reinforced Concrete Arch at Weston, Ont.—Falsework for Arch Ribs

Bonding Successive Layers of Concrete

Joints between successive layers of concrete which are considered very satisfactory by the maker have been obtained by the following treatment: The approximately horizontal surface of the concrete which is to be bonded to a subsequent layer is allowed to stand until any water which may have flushed to the top disappears. Then, while the mass is still moist, the surface is covered with about ½-in. of a 1:1 dry mixture of cement and sand, and protected if necessary with tarpaulins or boards. The moisture still remaining in the concrete suffices to produce a partial set in the dry mixture immediately adjacent to the surface of the concrete and above that to affect the mixture in a diminishing degree, the upper part of the mixture being unchanged. When it is convenient to apply the next layer of concrete the moisture in it completes the set through all of the unhardened dry mixture, interlocking the two courses, as it were. The joint between the two layers of concrete, although visible, is stated to make a much stronger bond than is usually secured.

A number of briquettes have been made of cement mortar cast in two parts and connected by a joint formed in this manner, and when tested developed a strength of more than 50 per cent. of the normal briquette of the same mixture made in a single piece.

This form of bond between successive layers of concrete was devised and has been extensively used by Mr. J. A. Jamieson, of Montreal, Canada, in the construction of a reinforced concrete elevator, a reinforced concrete conduit 10½ ft. in diameter and 8,000 ft. long, working under 33-ft. head, and for other works.

Scaffolding for Steel Frame Buildings

English Practice: Details of Design and Construction—Various Types of Portable Scaffolds—Methods of Interest to Canadian Contractors

By A. G. Thatcher*

British scaffolding is diverse and complex. Broadly speaking, it may be divided into two classes, the northern and southern systems. The line of demarcation at one time was very clear, the northern method being confined to Scotland, but during more recent years the interchange of ideas due to the press and cheaper facilities in traveling as well as other ways has caused the northern system to obtain a vogue in England. It is somewhat curious to note that pole scaffolding is chiefly used in England; that square timbers used in a type of scaffolding known as the Gabbard is principally Scottish in application, and that this latter closely approximates to the French system greatly used in Paris. It is possible that the historical connection between Scotland and France which existed at one time to the exclusion of England may account for this. The history of nations may be read in their architecture. The impermanence of the means of building may be the sufficient cause of preventing the engineering development of a country.

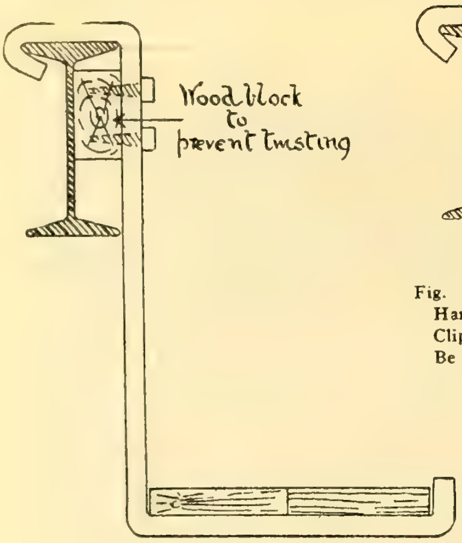


Fig. 1.—Ordinary Wrought Iron Hanger 18 In. Wide.

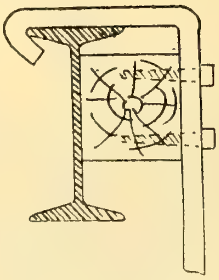


Fig. 2.—Showing How Hanger Too Deep in Clip for Flange Can Be Used.

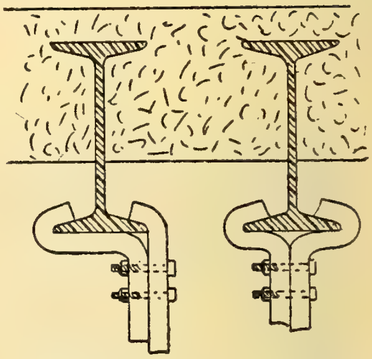


Fig. 4.—Clips that Are Used When Top Flanges Are Not Available.

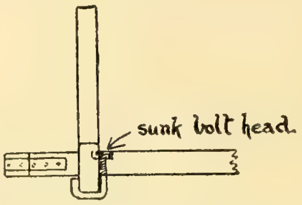


Fig. 3.—Method of Fastening Platform Boards to Hanger.

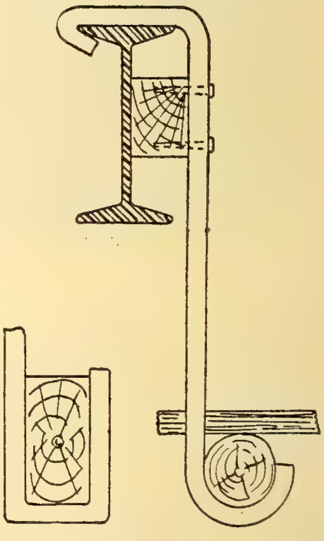
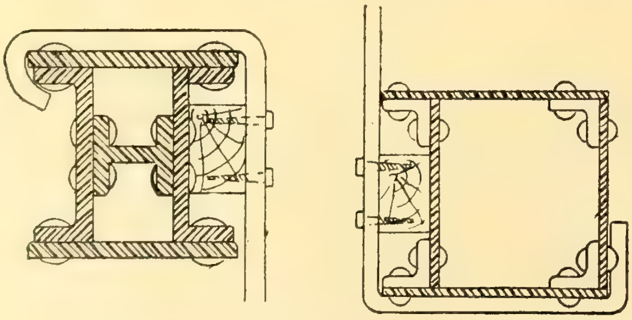


Fig. 7.—Method Used When the Platform Is Laid at Right Angles to the Girder



Figs. 5 and 8.—Methods Adopted in the Case of Compound Girders.

In considering the matter of British scaffolding in general, we shall first discuss portable scaffolds as used in England for steel frame buildings. While structures of this nature cannot now be considered new, nevertheless they are so sufficiently modern that the scaffolding for the steel erectors is not yet systematized. So far, however, as experience has guided, a general agreement has been reached that scaffolds supported on steel hangers afford the readiest means of carrying on the work.

The English practice is for the steel erection to proceed much in advance of the filling in, consequently pole scaffolding is not greatly in request until most of the steel is in its place. There are reasons for this, one of the principal being that steel is at all times difficult to handle. It is unsymmetrical in that the length of the members is considerable in proportion to the other measurements. This difficulty necessitates the builder giving space in order to move his material freely, and as it is obvious that pole scaffolding minimizes this greatly, the practice has developed of doing the work with the least possible extraneous erection.

---

*The author of this article is Inspector of Factories and has charge of the buildings in course of construction in London, England, for the purpose of preventing building accidents.

Steel hangers can be practically of any design, as they are easily made and of great adaptability. A platform width of 18 in. is usually given, but this can be increased. The illustrations presented herewith show those most generally in use. Fig. 1 represents the ordinary 1⅛ in. or 1¼ in. square wrought iron hanger 18 in. wide. The hook end in this case has just sufficient depth to clip over the top flange of the girder. If simply hung in that position there would be a tendency for the hanger to roll or twist when loaded. To prevent this a wooden block is placed where shown on the sketch.

In Fig. 2 is shown a hanger too deep in the clip for the flange can be used and kept firm. This is achieved by using a block of sufficient thickness to take up the superfluous depth of the hanger. In this instance the screws are absolutely necessary, as the liability of the block to move is increased.

In many cases the boards for the platform are simply laid on the hangers, being lapped in their run. This method is often sufficiently secure, but if any doubt arises the boards can be fixed by means of a clip, as shown in Fig. 3. If the bolt projects at all it might prove a cause of tripping, and to avoid this in thicker timbers the bolt head can be sunk as shown.

In Fig. 4 are illustrated clips which are useful where top flanges are not available. As will be seen, the hanger need not be immediately under the center of the girder, but either to the right or left, as circumstances may require. In the diagram the haunching which supports the flooring is supposed to be cut away to free the lower flange. Similar methods can be adopted for compound girders, as shown in Figs. 5 and 6.

At times it may be found useful to lay a platform at right angles to the run of the girder. To enable this to be done the hangers can be made to carry a pole or a length of quartering of sufficient strength, as shown in Fig. 7. Two poles hung from different girders are necessary, and on these the boards can be laid. A particular advantage is gained by this method, which is useful in many cases. It allows of a platform being laid to a width which is only limited by the effective length of the bearer poles. If a platform of [illegible]

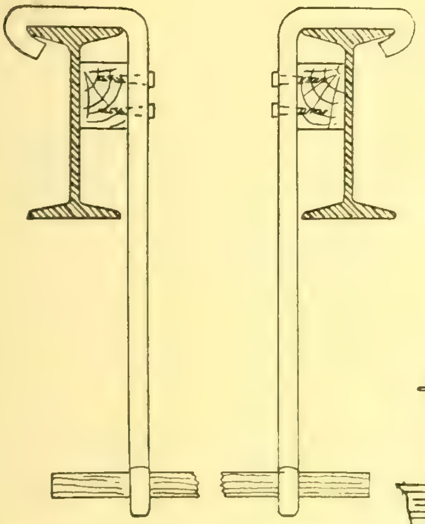


Fig. 8.—Method Adopted When a Platform Only 18 In. Wide Is Wanted.

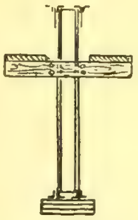
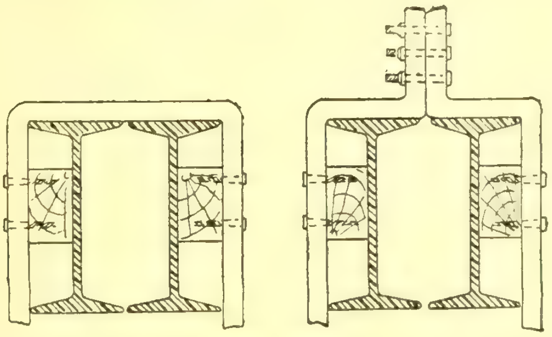


Fig. 15.—Cross Section of Fig. 14, Showing Planking Resting on the "Needles."



Figs. 12 and 13.—Manner in Which Hangers Can Be Used to Cover Double Girders and Carry Platform on Each Side

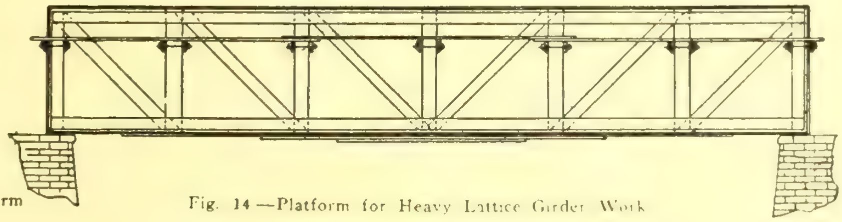


Fig. 14.—Platform for Heavy Lattice Girder Work

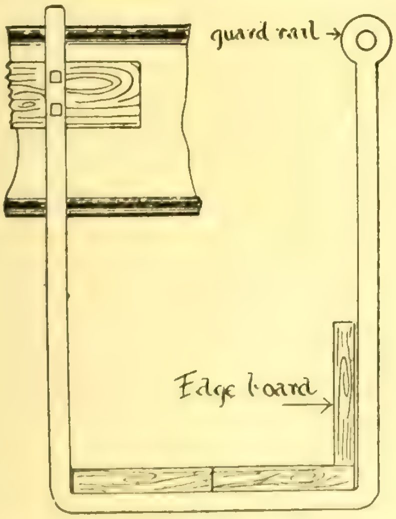


Fig. 9.—Sectional View of Platform When Arranged as Indicated in Fig. 8.

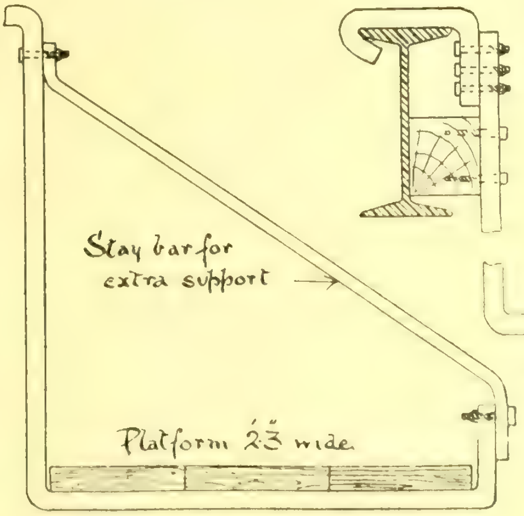


Fig. 10.—Hanger Provided with Stay Bar to Afford Added Strength

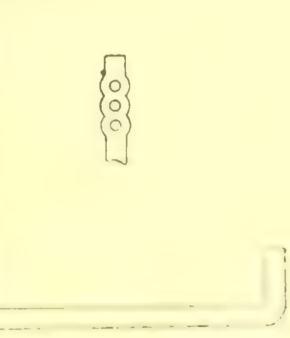


Fig. 11.—Hanger Made in Two Parts

m is wanted it can be gained by arranging the hangers, as shown in Fig. 8. A section of the platform when arranged in this manner is shown in Fig. 9, which also shows how the end of the hanger can be continued upwards to carry a guard rail or rope and permit an edge board being fixed. The edge board is particularly necessary on steel construction work as bolts, nuts, spanners and other tools often fall, owing, no doubt, in part to the extremely narrow platform on which the men work. To prevent this in a practical way nothing better than an edge board has been used in this country, although matting is used abroad—notably in Northern Italy.

The ordinary hanger, as already stated, is usually made to carry two boards, and this platform, with its loads, is considered sufficient for its strength. If, therefore, three boards are wanted, additional support must be provided, and this is given by fixing a stay bar, as shown in Fig. 10.

A disadvantage may be urged against the hanger in that it is cumbersome. It can, however, be made in two parts, as shown in Fig. 11. This also permits of differently sized clips being used to suit the flanges, the other portion of the hanger remaining of the standard size. Three bolts are wanted to make the connection, and the bars where joined should be slightly flattened out before the holes are drilled in order to give sufficient material around the bolt holes to withstand the stress that arises.

In Figs. 12 and 13 are shown the manner in which hangers can be made to cover double girders and carry a platform on each side. Fig. 13 being in two parts is, of course, the most portable. When used in this way the wooden blocks keep the whole arrangement rigid.

Fig. 14 shows the method of erecting a platform for heavy lattice girder work. It will be noticed that on the top boom of the girder flange plates have still to be put on similar to those on the lower boom. These plates could not readily be put in position if ordinary hangers were used, therefore a method of glanding timber cross-

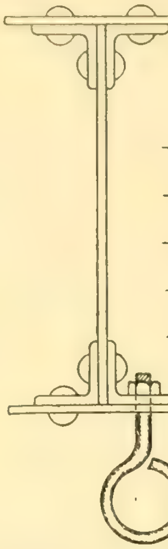


Fig. 16.—A Method Often Adopted to Carry Scaffolding.

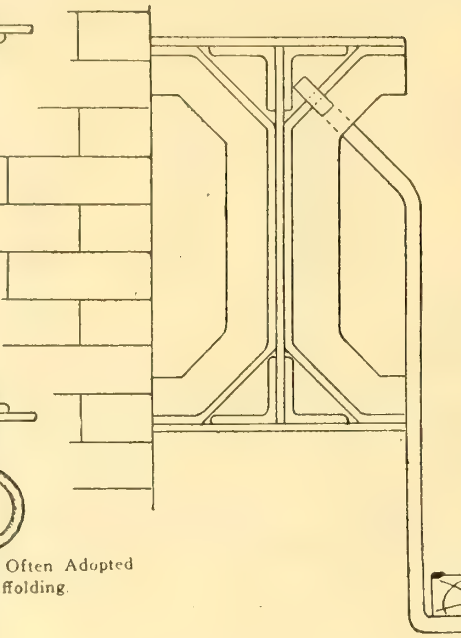


Fig. 17.—Hanger Useful Where Girder of Type Shown is Hard Against a Wall or Other Obstruction.

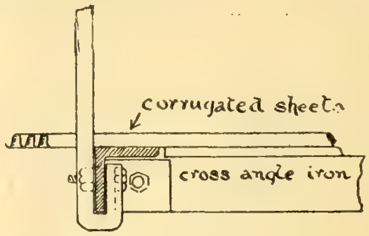


Fig. 18.—Method of Supporting a Fireproof Scaffold.

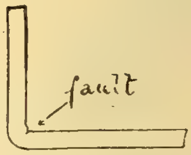


Fig. 24.—A Common Fault in Making the Hangers.

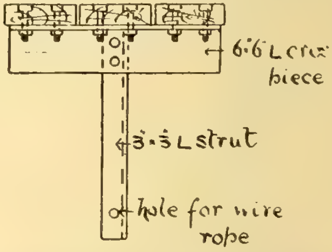


Fig. 23.—A Detail of the Lower L-Strut Shown in Fig. 21.

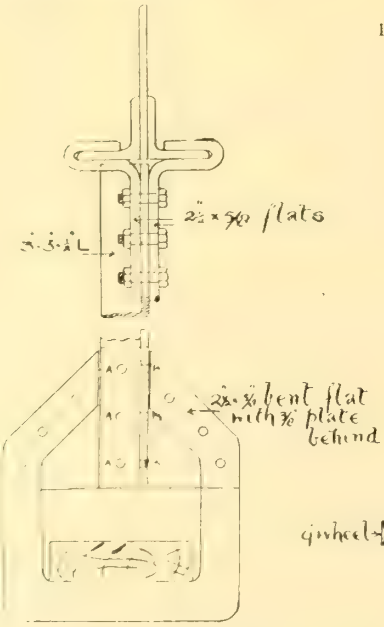


Fig. 19.—Hanger for Supporting Planks Laid Flat and Carrying Cross Planks.

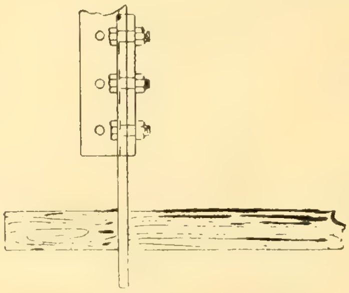


Fig. 20.—An Alternate Arrangement.

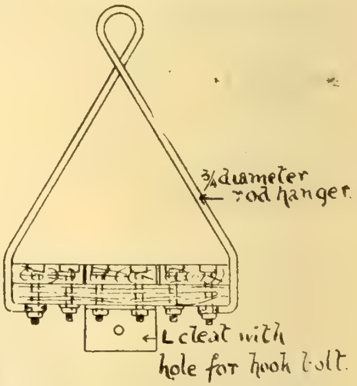


Fig. 22.—A Section of Fig. 21.

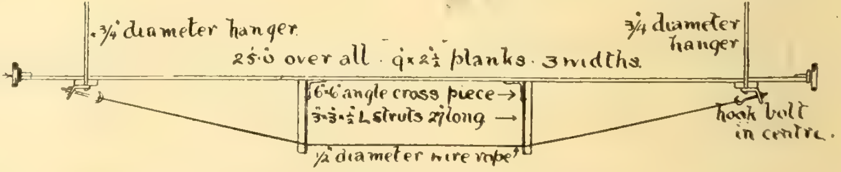


Fig. 21.—A "Trussed" Scaffold Capable of Carrying a Number of Men and Adapted for Use On Vertical Sides and Ends of Buildings.

heads to the struts is found most desirable. In the illustrations the crossheads, or needles, as they are sometimes termed, are shown fixed at the required distance from the top boom in order to allow of easy reach by the workmen. Fig. 15 is a cross section showing the planking resting on the needles.

A method often adopted to carry scaffolding is illustrated in Fig. 16. Rivets are cut out of the bottom flange at suitable distances apart, say every eight feet, and ring bolts inserted in their place. From these depend chains or cordage to carry whatever scaffolding may be required.

A hanger which is useful where a girder of the type shown is hard against a wall or some other obstruction that will not allow an ordinary hanger to be fixed is illustrated in Fig. 17.

Fig. 18 illustrates a method of supporting a fireproof scaffold on which fires for heating rivets are to be used. The hanger carries angle irons covered with a deck of corrugated sheets.

Fig. 19 shows a safe hanger for supporting planks laid flat. By removing the plate and "bent flat" from the holes marked "A" to those marked "B" the planks can be placed at right angles to the position first indicated, as shown in Fig. 20.

In Figs. 21, 22 and 23 is represented a scaffold capable of carrying a number of men and is useful for various purposes. By trussing it, as in Fig. 21, with a half inch wire rope and two hook bolts, a fairly long platform is provided. Fig. 22 represents a section of the arrangement with the hanger entire, but without the lower L-strut, a detail of which is presented in Fig. 23.

The manufacture of these hangers is easily accomplished by any ordinary smith, but care mut be used to guard against the common fault shown in Fig. 24.

Another record for deep caisson sinking has been established by the Foundation Company in caisson 123 for the new Municipal Building in New York, which was carried down to a depth of 110½ ft. below water level, or about 143 ft. below the curb. The caisson and working chamber are of concrete, 10 ft. 9 in. in diameter, and were built before sinking, above the surface of the ground, in three nearly equal successive sections, says the Engineering Record. The caisson was under pressure for 19 days and was sunk through sand into hardpan, through which the excavation was continued 6 ft. below the cutting edge to rock, which was leveled under a gauge pressure of 47 lb., diminished to about 45 lb. in the working chamber. This pressure was maintained until after the working chamber was concreted when the collapsible steel shaft was removed and the interior of the pier filled with concrete to a height of 114 ft. above the rock. This pressure, which probably closely approaches the limit for human work, is the highest yet attained by the contractor and probably has not been exceeded in this country. Notwithstanding it, the caisson was sunk without any fatalities or any serious injury to the workmen, who were very carefully safeguarded by restrictions which they were compelled to observe. A hospital lock has been provided, although, so far, it has been used only for comparatively trifling cases of the bends, and a surgeon is in constant attendance. Under maximum pressure the working time of a man on this caisson was only 40 minutes for each of two shifts, with a 6 hour interval between them. About as long a time was required for entrance and exit to the caisson, the latter being extended to 30 minutes for the maximum pressure. The lock tender was instructed to make the compression as slow as possible, and effected it by allowing the air to escape only by leaking through the stuffing box, with the outer controlling valve closed tight. This reduced the pressure to about 3 or 4 lbs. when it was overcome by the weight of the door and the men were released at the expiration of about 30 minutes. Coffee was provided as usual for the men on emerging, and they ordinarily remained in the sand-hog house for some time after leaving the caisson.

An Iowa man, according to an exchange, experimented with laying dust on brick pavement in front of his dwelling, and found that crude oil sprinkled upon the brick served to lay the dust for some time. Much of the oil was absorbed by the brick and the filler, and served to make the street dustless at that point. The experiment cost about $1.50 for the sixty feet frontage, including the wages of the men who applied the oil. The plans seems to be worthy of being followed up by further and more exhaustive experiments. If it can be shown that the dust can be laid for any length of time by this method, many merchants will be glad to have the paving in front of their places of business oiled, even if they have to bear a portion of the expense.

Complaint has been made in a Western city because the building department refused to issue a permit for a new manufacturing plant, and a charge was made of discrimination. The inspector shows that there was no discrimination, but the plans were so vague and indefinite that it was impossible to determine the kind of building desired. The plans were incomplete as to floor construction, spacing of beams and joists, lacking as to the roof construction, showed too weak a floor for the plant, and in other ways was too meager to check up. The inspector is entitled to credit for enforcing the requirements of the ordinance. In summarily rejecting the plans he did nothing more than he should have done.

Wood Pipes

Wood pipes made from full sized logs have been in use for many years, says the *Ohio Architect*. Occasionally at the present time such pipes are dug up in the course of modern improvements and are found to be in a very good state of preservation. In several instances such pipes are still in use after a service extending over a period of 50 to 75 years.

The pioneers of the Atlantic Coast used wood pipes made by boring a hole lengthwise through a full sized log. The pioneers of the Pacific Coast use wood for pipes also and with greater economy, because of the advantages gained by virtue of past experience and modern manufacturing methods. To-day wood pipes are made of staves so manufactured as to give a cylindrical shape which is absolutely uniform and waterproof. The pipes of small size, up to two feet in diameter, are made from staves of special pattern with groved edges and are built up in the factory. The pipe is wound from end to end with steel wire and coated with a mixture of asphalt and tar for preservative purposes. The thickness of the staves and the pitch of the winding vary according to the pressure under which the pipe is to be used. Large pipes over two feet in diameter are generally built up at the point they are to be used, the staves being placed so as to break joints. These staves are made six inches wide and are shaped with plain, bevel edges, and a curvature to conform to the diameter of the pipe. Special patented bands girdle the pipe and are drawn up tight so as to close all joints.

Methods and Cost of Concrete Paving Work

Some Instructive Particulars from the City of Boise, Idaho—Practical Details from Inspectors' Records and Contractor's Estimate

The city of Boise, Idaho, has recently thrown open to traffic some 8½ blocks of concrete pavement. The contract for this pavement was let nearly a year ago, but owing to the many unforeseen difficulties encountered by the contractor, it was not completed until late in July of this year. The pavement was constructed on Front St., and will be subjected to a slow but heavy traffic. The width of the pavement is 69½ ft. The reason for this being that on the south side of the street no sidewalk or curb is required as teams drive directly to the warehouses located on that side. The street car track is laid in the center and the north sidewalk and curb are narrowed to 10½ ft. The cross section of the pavement was made with a rise continually across the street of .02 ft., and with no crown except on three blocks. The concrete was mixed in the properties of 1-3-7. It was found that this mix produced a concrete that filled well, and which after thorough tamping could be smoothed off with a wooden float. There was no top cost, the specifications requiring only a uniform surface, with no stones larger than ½ in. in diameter showing. After the concrete had set sufficiently it was covered with 2 in. of dirt and was left wet for seven days. The concrete was 8 in. thick, expansion joints, ½ in. wide, were pointed at the curbing and at each 25 ft. at right angles to the center line of the street. The joints were made with ½ in. boards, which were left in the concrete for two or three weeks, until it had set hard. Some of these boards were left in the concrete all winter. The contractor had much difficulty in securing these boards and found it an expensive task. It was also hard on the edges of the joints. A hook ⅜ in. wide and 3 ft. long, gave the best satisfaction in removing the boards.

The joints were filled with a mixture of tar, pitch and sand, all heated together and poured in when hot. The joints had to be gone over at least twice to fill them full.

A good quality of river sand having 30 per cent. of voids was used for the concrete. The gravel consisted of crushed granite boulders up to 6 in. in diameter, porphyry, rhyolite and various other forms of river work in a mountainous county. These were received through a 2½ in. mesh screen. The gravel was obtained from the bed of the Boise River and was all passed through a jaw crusher to crush the oversize. Tests showed that the gravel contained about 40 per cent. of void.

The mixing was done by two machines—a 5½ cu. ft. batch mixer run by a gasoline engine, and a 7 1-3 cu. ft. batch mixer run by an electric motor. The larger mixer gave a much higher efficiency. Grading work was commenced on Sept. 13. The subgrade was fairly good, as little spongy material was found and sand was only found in a few places. As the sand will have little chance of moving, it was considered good foundation. The subgrade was rolled with a 16-ton roller and all spongy places refilled with gravel. The use of the roller was loaned by the city, but in the data given below the cost of rolling to the contractor is estimated at $10, this estimate being for coal, engineer, repairs, etc. As the sub-grade was very good, very little rolling was required; in fact, the roller was in use for only 7 days. The total cost of the excavation was $3,010. As the total excavation amounted to 5,594 cu. yds., the cost per cubic yard was 54 cents. As the bidding price for the excavation was 48 cents per cubic yard, the figures show that the contractor lost $325.30 on this portion of the work. This loss, however, was reduced approximately $150 by the sale of dirt from the streets.

Concrete mixing was started on October 7 and finished July 8. No concrete work was done from December 9 to April 21. Table I. shows the outputs of the mixers by months and the labor cost of mixing and placing the concrete. The total labor cost of mixing and placing the concrete was $5,452.74. As a total of 4,483.16 cu. yds. of concrete was placed, the cost per cubic yard was $1.22. Included in this cost is the finishing of sub-grade after rolling. (The contractor sublet the excavation, but was to do all work after the subgrade was rolled). This he did with his concrete gang when the gravel supply was irregular, or when moving mixers, or when the gasoline engine was out of order. The covering and watering is also included in the concrete labor cost, and some of the uncovering is also included. The total number of batches of concrete was 22,298, the average cost per batch being 25 cents.

The total yardage of pavement was approximately 20,408. A summary of the cost of the work to the contractor, according to records kept by inspectors on the job, shows the following:

	Total.	Per sq. yd. Pavement.
Excavation, 5,594 cu. yds., at 54 cents......	$3,010	$0.1475
Concrete labor, mix and place 4,483 cu. yds., at $1.22	5,483	0.2686
Cement, 13,181 sacks........................	9,061	0,4440
Sand and gravel............................	3,900	0.1911
Roller, 7 days, at $10........................	70	0.0034
Cleaning pavement and labor on expansion joints	451	0.0221
Paving pitch and tar..........................	600	0.0294
Sand joints	6	0.0003
Extras, estimated	1,000	0,0490
Totals..................................	$23,581	$1.5554

In the above summary the cost of the gravel is largely an erstwhile, as only about one-half was obtained from the contractor's plant, the remainder being obtained from various other sources at about $1.10 per cu. yd. The gravel obtained from the contractor's plant cost 80 cents per cubic yard delivered. The sand also cost 80 cents per cubic yard. The cement was contracted for at $2.75, but the contractor was frequently forced to buy where he could and often paid more than the contract price for small lots. Labor was paid $2.50 per 8-hour day and teams were hired at the rate of $5 per day.

The following is the contractor's final estimate on the work:—

4,483.16 cu. yds. concrete, at $5.20....................	$23,312 43
5,594.18 cu. yds. excavation, at 48 cents..............	2,685 20
30 cu. yds. subgrade, at 55 cents......................	16 50
30 cu. yds. refill, at 85 cents..........................	25 50
9,988 lbs. gutter plates, at 5 cents....................	499 40
Total amount due	$26,539 03

This against his cost of $23.58 shows a profit of $2,957, which is 11 per cent. It was freely predicted among the contractors that this contractor was losing money.

Only a block and a half of the pavement was opened to traffic last fall, so it is impossible to judge as to its wearing qualities. However, the Board of Public Works of Boise this spring let a contract for nearly 60,000 sq. yds. of similar pavement, except that the thicknes is to be 6 in.—*Engineering-Contracting.*

J. G. Kilt, of Ottawa, has purchased all the damaged iron and steel work of the demolished Quebec bridge, according to a despatch from Quebec. The price is said to exceed $100,000. Mr. Kilt, it is said, has already turned over his purchase at a large profit and will begin shipping the metal to Montreal, Hamilton and Pennsylvania immediately.

English Experience with Dustless Roads*

The short word "tarring" can be usefully employed to cover the general subject of waterproofing our road surfaces so as to render the road impervious. The revolution in road engineering and maintenance therefore consists in waterproofing our roads by one or other of the bitumens, tars, pitches, whether natural or artificial, which offer themselves in ample quantity and at reasonable prices for waterproofing purposes.

Setting aside the temporary palliatives of watering our roads with chemical preparations which keep the road damp by the absorption of moisture from the air, the treatment which has been most successful in rendering our roads dustless has been by the surface application of tar applied either by hand or by machine. By this method great lengths of road have been rendered dustless for a whole summer season, the mud in the winter following has been reduced in quantity and in some cases the application has lasted for more than one season. Moreover there is almost unanimous testimony that the whole cost of the treatment is more than saved by the increased durability of the road, and already many surveyors are able to make a strong case for the extension of the treatment solely on the ground of economy alone.

In Fulham, where only a very light waterproofing dressing was given, Mr. Wood, the surveyor, stated that he had removed in 1908-9 only 190 (long) tons of sweepings and mud per mile, instead of 390 tons, as formerly, and this of itself shows that not only was the amount of material worn by the traffic from the surface greatly reduced, but that the working up of the subsoil to the surface was also prevented by the application of tar.

These satisfactory financial results, which were known to a certain extent in 1908, would have caused a very great increase in surface treatment during 1909 if it had not been for the exceptional nature of the season, as there were very few days during the spring and summer of 1909 which were suitable for satisfactory tarring.

The committee has already obtained a considerable number of replies to a circular letter sent out to surveyors of the South of England, and from those received up to date, and which relate to 4,513 miles of main roads in the home and southern counties, it is shown that the length of roads tarred and rendered dustless has increased from 393 miles, or 9½ per cent. in 1908, to 657 miles, or about 16 per cent., in the year under review, so that if the same proportion has been observed throughout the kingdom we should expect to find that nearly 4,000 miles have been dealt with, although, probably, as the rainy weather was more prevalent in the north than in the southern counties, the proportion of roads intended to be treated, but which were not treated, is probably larger in the north than in the south.

Use of Tar-Macadam.

As regards the second and more permanent mode of treatment, which is that of remaking the whole of the surface of the road with tar-macadam, this is undoubtedly the most permanent and satisfactory method, and when a road has to be resurfaced it is also the most economical in the end. A good deal of progress has been made in this direction; all over the country short lengths have been experimentally laid, and the results have been so satisfactory that the surveyors have signified their intention to increase this method of repairing at a rapid rate. Several surveyors, notably those in West Sussex and in the Staines District, have introduced an intermediate method, which is likely to be of great importance in improving our narrower second-class roads. In place of relaying the whole width of the road with macadam, the worn portions or tracks which have been made by the traffic have been cut out and filled in squarely and smoothly with the best class of tar macadam, well beaten in and afterwards rolled, and the whole surface of the road afterwards tarred superficially. This gives two broad, smooth tracks, which offer the least resistance to the vehicles, so that automobilists, in common with the other traffic, prefer to use these tracks, and the wear and tear of the rest of the road are thereby saved. It is probable that we shall see a considerable extension of this system for the remaking of the narrower and secondary roads of the kingdom.

During the year 1909 the club has been requested by many of its members and associates to use its best efforts to secure dustless roads throughout the country, and this desirable object has been furthered by meetings with those responsible for the construction and maintenance of the roads, and in many cases with conspicuous success. Road surveyors and others have shown themselves to be well aware of the national importance of the question, and some of them have already stated that it must now be taken as an accepted fact that automobile traffic is the traffic of the time and of the future, and that therefore no time must be lost in resurfacing the roads of the country to suit this form of traffic. It is satisfactory to be able to record that this resurfacing of the roads on a more scientific basis, instead of being a costly undertaking, as was thought at one time, will, if carried out in the manner that past experience dictates, prove a real benefit to the ratepayers.

Finally, it must not be overlooked that the application of tar to the surface of the roads is extremely valuable from the sanitary point of view. It is undoubtedly a fact that the very small quantity of dust arising from a tar-treated road is far less liable to carry disease germs than the ordinary dust from untreated roads.

---

*From the annual report of Dustless Roads Committee of the Royal Automobile Club of England.

Extensive Road Work in B. C.

An Outline of Government's Plan of Development throughout the Province—An Ambitious and Progressive Policy

There would seem to be a progressive policy of road improvement in British Columbia from the following resolution passed at a recent meeting of the Victoria Board of Trade:

"It is hereby resolved that this Board notices with appreciation the large amount of wagon road construction which the Provincial Government has under way in the various portions of the Province, and this Board, believing that a first-class system of roads is essential to the proper development of the Province, urges that the main trunk highways from north to south and from east to west on both Vancouver Island and the Mainland, be pushed to completion as quickly as is reasonably possible.

"Further, this Board is of the opinion that in the construction of all new roads that wherever reasonable, practical permanent locations should be followed with the most ample right of ways and moderate grades, and curvature and construction generally of a higher class than the standard formerly followed in such works.

"This board is also of opinion that the Provincial Government should construct and locate, widen, straighten or improve, regulate or control, and in every way administer at the cost of the Provincial Government throughout all parts of the main trunk highways that pass through any municipality.

"Copies of this resolution to be forwarded to the Hon. Richard McBride, Premier of British Columbia, and to the Hon. Thomas Taylor, Minister of Public Works."

Mr. A. E. Todd, Vice-President of the Board of Trade, who is taking an active interest in the question of good roads, not only in the Province, but also along the Pacific Coast, in fathering the above resolution gave an interesting address on the Pacific Highways Association, of which he is a member. He explained that this was composed of a large and enthusiastic membership drawn from Washington, Oregon, California, British Columbia, and Alaska. Its main object was the construction of a highway, if possible, from the Mexican boundary to Vancouver, the building of which would be carried out along the Pacific slope.

Mr. C. H. Lugrin gave an outline of the Provincial Government's plan for road development through British Columbia. He stated that from conversation with the Hon. [illegible] learned that it was the Government's intention to extend the trunk road from here to Campbell River as far as the north end of the Island, as well as build a road to Buttle's lake, and, he hoped, one to Clayoquot from Alberni.

The programme of work for the mainland was a very ambitious one and practically comprised the building of trunk roads from the coast to Alberta and from the boundary of the Province as far north as Hazelton. The transcontinental highway, the proposal for which originated with Mr. Taylor himself, consisted in the joining up of existing roads. There was at present a road on the south bank of the Fraser as far as Port Hope. This it was proposed to continue up the valley of Roach Creek and over the Divide down the Similkameen and so on to Alberta.

This would provide for about 400 miles of road in a continuous line. A motor had already been driven from Kootenay Landing to Calgary, and when the Hope Mountains were crossed there would be only one gap to be filled. It was further proposed to connect this east and west road with a north and south trunk highway. From Ashcroft the old Cariboo road would be followed along the east bank of the Fraser to a point opposite Fort George. From there it would be necessary to ferry across the river. From Fort George the road would follow the Nechaco valley to the Divide separating Nechaco from the Bulkley valley and then would follow the Bulkley valley as far as Hazelton. This north and south road would be from 500 to 600 miles in length, so that the Provincial Government's policy involved the construction of possibly a thousand miles of trunk roads. He also spoke of the excellent character of the work now being done on the Old Cariboo road, where the most modern appliances are being used and the operation of the ''wide-tires'' law has been found to be most beneficial.

The knowledge of such a road building programme ought to prove a great stimulus to the proposed scheme of the Pacific Highway Association, said the speaker. In the manner of road building now being employed in the Province up-to-date methods were being employed. The policy of the Government as outlined would provide for an excellent system of roads.

The Use of Concrete in Freezing Weather

Conclusions Reached after Complete Series of Tests Preventive Methods and Their Application — Effect of Salt Upon Strength of Material

By Geo. P. Dieckmann

One of the most valuable properties of concrete or cement mortar is that it is not affected by frost after attaining its setting time. It is a well known fact that the temperature has a great influence on the setting and hardening of cement and concrete. A high temperature will accelerate the setting and a low temperature will retard the same, even a difference of ten degrees might change the setting time to quite an extent. The prevention of concrete from becoming frozen before it has had time to harden should be more fully investigated. It has been found that some concrete which had been made at a freezing temperature has not shown any defects, while on the other hand concrete made under similar condition become disintegrated and worthless.

It has been recommended that the materials be heated, especially the sand and stone, and also to use warm water. The use of soda ash and chloride of calcium mixed with water is also advocated. The warming of the materials is frequently used, but it is practically impossible to heat and mix a large body uniformly. The application of warm water is more practical. The addition of salt dissolved in the water seems to be of advantage for preventing freshly mixed concrete from freezing.

The following series of tests have been made to ascertain the amount of salt that might be used without affecting the strength of the concrete and are made in six different series, which are designated by the letters A, B. C. D. E and F. Each of this series consists of five different tests, which are designated by the numbers 1, 2, 3, 4, 5, and are made on briquettes of 2, 7, 28 and 60 days on neat cement and mixtures of 3 parts standard sand and one part of cement, using Northwestern States Portland cement and making a total of 480 different briquettes.

I will not go into these tests in detail, as it would take too much time, but will give briefly the results of each series.

The series A was made at normal temperature and with the materials and water having normal temperature. The resulting briquettes were stored in air at normal temperature for 2, 7, 28 and 60 days. The different tests which are numbered are arranged by numbers. No. 1 has been made on material without the addition of salt, No. 2 has 1 per cent. of salt added, No. 3 has 2½ per cent., No. 4 has 5 per cent., and No. 5 has 7½ per cent. The addition is calculated on the dry cement. The other series, which of course are treated under different conditions, are made with the same amount of salt and are numbered in like manner; that is, No. 1 in all of the series is made without salt, No. 2 with 1 per cent., etc. The results obtained from series A show that the addition of from 1 to 2½ per cent. of salt has increased the strength.

The series B was made in the same manner as series A, everything at normal conditions, with the exception that all briquettes of series B were immersed in water at normal temperature. With the addition of 1 per cent. salt the increase of strength over the brnquettes having no sale was considerable, for example: the briquettes without salt at two days showed 615 pounds and with 1 per cent. salt added showed 890 pounds. At seven days and without salt the briquettes showed 740 pounds and with 1 per cent. salt added showed 1,065 pounds on neat cement. The two series A and B were only made for study and to ascertain the behavior of salt at normal conditions on briquettes stored in air and water. It was expected the results on the immersed briquettes would be higher.

It was not advisable to carry on the tests with the addition of more than 7½ per cent. of salt, as the addition of 5 per cent. already showed to be detrimental, not only in strength, but the cement also became quick setting. attaining a disagreeable color and showed a white percipitate and streaky surfaces.

The series C was made at freezing temperature, 32 degrees F. All the materials and water were at freezing point. The briquettes were stored for their different periods at freezing temperature. The addition of 1 per cent. salt showed a high increase in strength, especially for the first forty-eight hours, which was, without salt, 60 pounds for the first forty-eight hours. with 1 per cent. salt 245 pounds, for 7 days without salt 277 pounds and for 7 days with 1 per cent. salt 980 pounds; at 7 and 28 days the results without any salt are about the same, which is most noticed in the sand mixtures. At 60 days the 1: 3 sand mixtures without salt show the best results.

The series D were made at freezing temperature, all materials and water warmed up to about 75 degrees. The briquettes were stored in air at freezing temperature. The addition of 1 per cent. salt showed a high increase in strength as in series C. It was expected that the results on this series would be still higher as the materials were all warmed, which naturally accelerated the setting time and give a higher strength for the early stages, but such was not the case and might be explained by the fact that the temperature being at freezing point the materials were cooled quickly to the temperature of the atmosphere, which conditions would also exist in practice, and the warming of the

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

WE MANUFACTURE

HOUSE TRIM Pine and Hardwood

Special attention given to

Chestnut Trim

Estimates promptly given for quick and good work

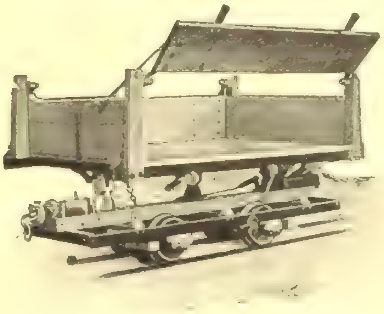
The Tillson Co., Limited

Tillsonburg, Ont.

The

Meaford Wheelbarrow Co. Limited

MEAFORD, ONTARIO



Manufacturers of Contractors' Supplies, etc.

WHEEL SCRAPERS—Pressed Bowl and Square Box.

DRAG SCRAPERS—Pressed Steel, Handles on top or sides, with or without runners.

DUMP CARS—GRADING PLOUGHS.

STERLING line of Roller Bearing, Easy Pushing Wheelbarrows and Concrete Carts.

WHEELBARROWS of every description, both in steel and wood.

TIMBER DOLLIES, TRUCKS of all kinds.

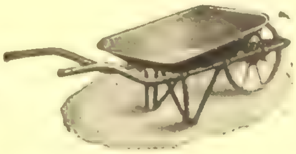
ASK FOR OUR CATALOGUE

SELLING AGENTS:

Alexander Gibb, 13 St. John Street, Montreal.

Bissett & Loucks, Ltd., 151 Notre Ave. E. Winnipeg, Man.

John Burns, 313 Water Street, Vancouver.



SAND and GRAVEL

A SPECIALTY

We have the above in various grades ready for immediate delivery

Let us quote on your requirements.

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 1664 1665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

details would cause a good deal of expense and delay without giving results. Of course the materials should never be used in a frozen condition, the sand should be warmed to dry out the frost and it would be advisable to store the aggregates ahead in a suitable storage building.

The series E was made at freezing temperature, all materials and water were warmed to about 75 degrees F. Briquettes were stored in air at freezing temperature and then subjected to constant freezing and thawing for twelve hours each day until seven days, the remaining time stored in freezing temperature. The addition of the salt increased the strength for the first two and seven days. The alternate freezing and thawing affected the strength in all neat cement briquettes at seven days and decreased at 28 and 60 days over the seven-day briquettes, showing that the freezing temperature retarded the crystallization on the sand mixtures without salt and with 1 per cent. salt show no effects on seven days and increased at 28 and 60 days in a satisfactory manner, while the sand mixtures with 2½, 5 and 7½ per cent. salt show a marked decrease after 28 days over the seven-day briquettes.

Series F was made in the same manner as series E, subjected to alternating freezing and thawing, but instead of storing the briquettes after seven days in freezing temperature the briquettes of this series were stored at about 80 degrees F. for the 28 and 60-day tests. Up to seven days this series was treated under the same conditions as series E and the tests show the same results. At 28 days this series showed a general increase over the seven-day briquettes, the addition up to 7½ per cent. salt showed good results. At 60 days the neat cement briquettes showed a marked decrease. The test No. 4 with 5 per cent. salt and No. 5 with 7½ per cent. salt show an increase in strength. The sand briquettes show no decrease and give more uniform results, as in series E.

From these tests it seems that frost affects the hardening of neat cement, especially in the early stage, but with the addition of from 1 to 2½ per cent. of salt the cement showed good results. Neat cement is never used for practical purposes, but these tests are of interest to better understand the action of concrete and form a better knowledge.

Slight frost does not seem to affect concrete mortar to any marked degree. The addition of from 1 to 2½ per cent. of salt is of advantage, but over 2½ per cent. there is a marked decrease in tensile strength; also the excess of salt is deposited as a white precipitate on the surface and the mortar has a dead, unpleasant color. It follows that if salt is added to prevent freezing the amount ought to be weighed and dissolved in a measured volume of water, which should be reduced as much as possible and practicable.

Railroad Construction in B. C.

The C. P. R. and C. N. R. have extensive plans for the development of the resources of Vancouver Island, and there will be keen rivalry between the two companies.

The advantage of priority in possession through its recent acquirement of the Esquimault and Nanaimo Railway, and the million and one-half acres of land grant which that railway carried, lies with the Canadian Pacific Railway, but the Canadian Northern Pacific, on the other hand, is assisted in its colonization and development programme by the Province, which has guaranteed the interest on the company's bonds at the rate of $35,000 per mile from the eastern boundary of the Province, to its terminal on the west coast of Vancouver Island.

Construction of the mainland sections of the Canadian Northern Pacific is already under way, but the selection of the route from Victoria to the west coast of the island has been unavoidably deferred until now, owing to the paucity of dependable information regarding physical conditions and possibilities in respect to the development of traffic.

The line from Victoria to Barkley Sound which has been accepted by Premier McBride, provides for the construction of one hundred and fifty-three miles, instead of the one hundred miles provided for under the legislation covering the bond guarantee, the location survey shows a maximum altitude of seven hundred and fifty feet and maximum gradient of 1.5 per cent., and a comparatively easy rise and fall.

The two lines will be largely parallel throughout the length of the island, the Canadian Pacific Railway having already invited tenders for construction from the present Esquimalt and Nanaimo terminus at Wellington, by way of Comox.

It is expected that by the first of May the rival companies will have 3,000 men engaged in construction on Vancouver Island. To guarantee itself against a possible labor famine the Canadian Northern now has four agents actively engaged in England recruiting unskilled workers, who are assured continuous employment at good wages during the next three years, this policy being in distinct contrast with that of the Grand Trunk Pacific, which recently announced its inability to proceed rapidly with construction in British Columbia unless permitted to employ Asiatic labor.

Industrial Training

Speaking at a banquet at Sault Ste. Marie, Ont., given by the citizens of that town and Steelton to Mr. William Franz, General Manager of the Lake Superior Corporation, Hon. Mackenzie King, Minister of Labor, declared that nothing was so essential at the present time, both in meeting the present competition of Europe and the future competition of the Orient, as development throughout the whole Dominion of a system of industrial training and technical education which would afford to every workingman in the country an opportunity of realizing the utmost of which he is capable and which would bring to our industries and industrial processes an organization second to none to be found in any other part of the world. The Commission on Technical Education appointed by the Dominion Government is investigating the needs of the industries of this country, and will travel abroad shortly to ascertain the means by which similar needs are being met in other lands. It will then remain for the Provinces of the Dominion to supplement the work of this commission by helping the Federal Government to afford adequate training facilities for Canadian trades.

Personal News and Notes

Mr. William Turnbull has been appointed city building inspector of New Westminster, B.C.

The annual meeting of the Road Builders' Association will be held at Indianapolis, Ind., Dec. 6-9.

To rectify errors made in surveying the city of New Westminster, B.C., a re-survey will be made by Mr. A. E. Cleveland, of Vancouver, at an estimated cost of $6,000.

Messrs. Weeks & Keefer, architects, of Ottawa, Ont., have dissolved partnership, and in future will conduct separate offices—Mr. Keefer at 229 Sparks street, and Mr. Weeks in the Canada Life Building.

Mayor Hopewell, of Ottawa, is persevering with his driveway scheme. Last week he took the members of the Ottawa Commission over the route. Accompanying the party were Sir Wilfrid Laurier and Hon. Mackenzie King.

The death occurred at Forward, Sask., on October 18th, of F. W. Brunskill, a well known contractor of Winnipeg, Man. The late Mr. Brunskill was born at Davisville, Ont., 27 years ago. He started contracting on his own account in 1907, and during the past two years has undertaken important works for the C. N. R. in Saskatchewan.

Mr. F. W. Macey, architect, of Vancouver, B.C., has been recommended to the Royal Institute of British Architects as examiner on specifications and estimating in the final examination for membership of that body. Mr. Macey is as yet uncertain if he can accept the invitation, as it involves his personal attendance in London during the examination.

Smokestacks

We can build them quick of the right quality and at the right price.

Boilers

Do you need a boiler? Let us quote you. We guarantee our Boilers and stand behind our guarantee.

Steel Tanks

We make all sizes and shapes for water, oil or anything else. We make them right and tight.

We have the facilities for manufacturing these goods quickly and in the best manner. We will be glad to quote.

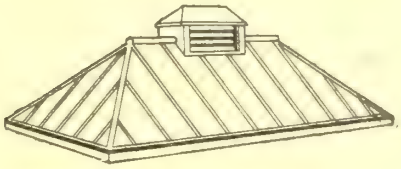
Marsh & Henthorn, Limited
Belleville, Ont.

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

FOR CONVEYING AND TRANSMISSION

Scandinavia Belt is considered the best Conveyor Belt that has ever been put on the market, for conveying Ore, Rock, Cement, Clay, etc.

It is not made in plies, and will not come apart.

Equally good in wet and dry places.

This illustration shows 20″ Extra Stout Scandinavia Belting for conveying Cement.

Write for Bulletins, price lists, and discounts.

Federal Engineering & Supplies
284 Yonge Street, TORONTO Limited

AGENTS: Power Economics Ltd., Montreal. McDougall Hardware Co., Ottawa
Marks-Clavet-Dobie Ltd., Pt. Arthur. Great West Saddlery Co., Calgary.

Agents Wanted in Other Cities.

The Original

MARSH - PAUL AIR VALVE

Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

ORNAMENTAL IRON WORK
WIRE CLOTH
WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our
WINDOW GUARDS
Insist on having HARD STEEL WIRE
WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

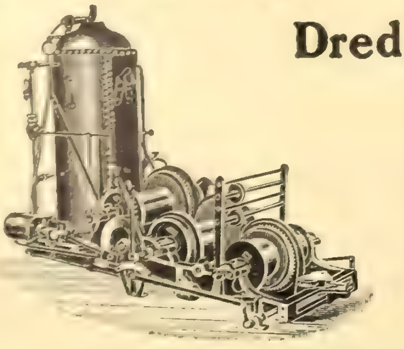
Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Harry Allen Jacobs
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

Canadian Agents:
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of obsorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.

Limited

Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Established 1882

THE COMMERCIAL

The Weekly Financial, Commercial & General Trade Newspaper of the Great West.

Winnipeg Manitoba

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.

Limited

Phone 423 and 2457

HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

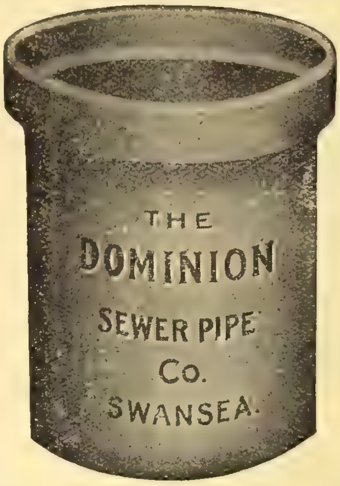
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

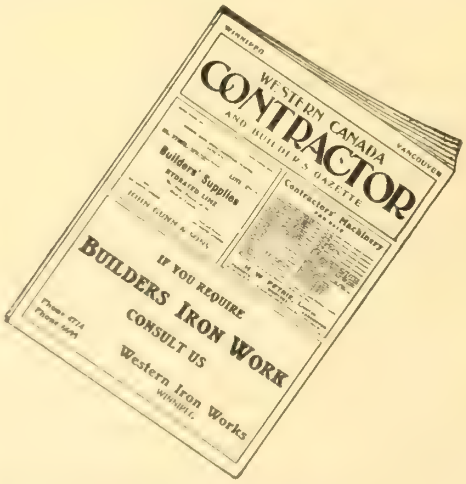
also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.


WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDERS' GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.
General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF
Vitrified Salt Glazed
Sewer Pipe
in the WORLD

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW,
President.

R. H. NEW,
Vice-President.

The Most Satisfactory Sewer Pipe that is being offered to Canadians

We aim "and our aims are realized" to make the best line of Vitrified Salt Glazed Sewer Pipe that is being offered to the Canadian trade. The consumers, contractors, corporations and dealers throughout Canada mostly prefer our product, quality being their first requirement. Then, too, we pay special attention to inquiries.

Prices, and last, but most important, "DELIVERY"

You simply cannot afford to buy elsewhere

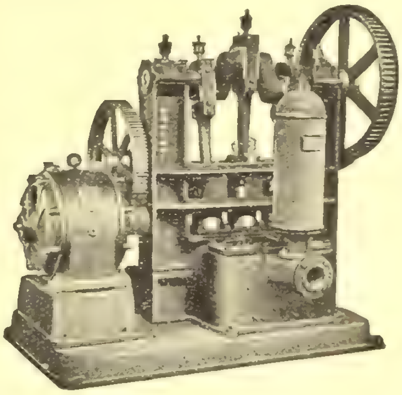
The

Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY

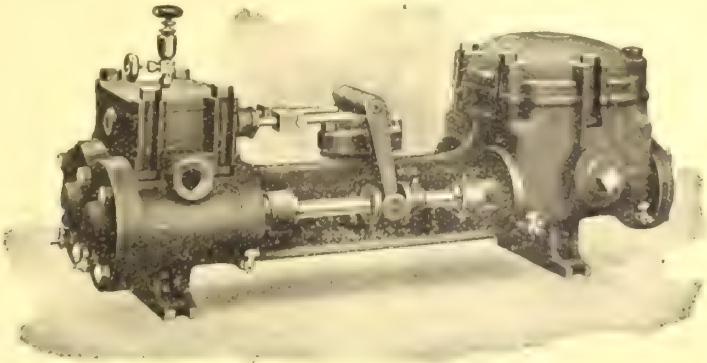


Goulds Pump Co.
Coristine Building, **Montreal**
Phone Main 1054
Works: Seneca Falls, N.Y.

Duplex Steam Boiler Feed Pumps

In design and construction, our new Standard Duplex Pumps conform to the latest and most approved practice, and in addition include a number of special features of merit described in our Bulletin No. 36. :: ::

Full Stroke under all conditions.



Reliable in Service.

Compact in Design.

Canada Foundry Company, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Winnipeg Calgary Vancouver Rossland

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

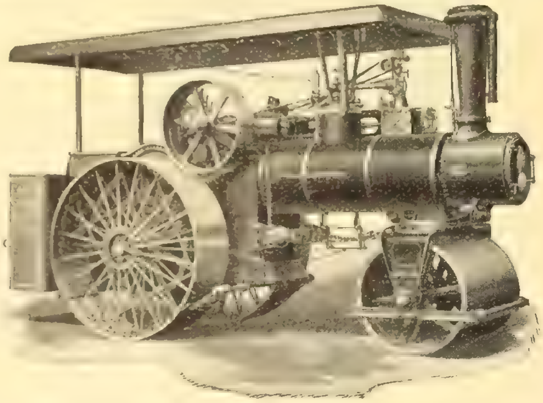
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Ten per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.
The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

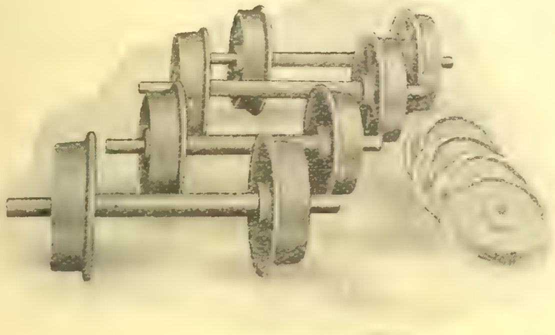
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que.
Hamilton, Ont.
Three Rivers, Que.
Midland, Ont.
Londonderry, N.S.
St. Thomas, Ont.
Fort William, Ont.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

BUILDERS AND CONTRACTORS

IT PAYS!

To Deal with an Up-to-date Supply House

WATER-WASHED SAND
CEMENT
CRUSHED STONE
CRUSHED GRANITE
AND TILE

Phone Office 1217
Yard 4507

Sand & Supplies, Ltd.
TORONTO

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Illinois Engineering Co.

CONSULTING ENGINEERS

**VACUUM STEAM HEATING
and DRYING SYSTEMS**

Canada Office, 72 King St., E, Toronto, Ont.
Phone Main 1907

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 Toronto, Ont.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to $150.00	

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.......	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
100 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent
High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off caulking lead, 1½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, $1.05 per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

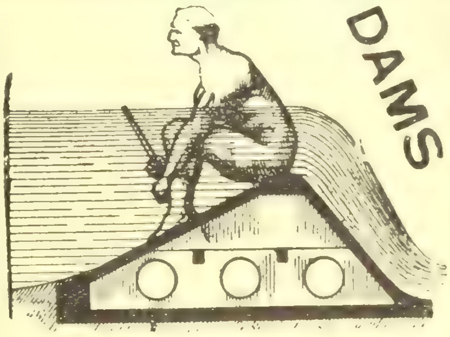
The Lachine Motor Works, Montreal, Que., are stated to have dissolved.

The assets of Jno. Morrison & Son, Ltd., Montreal, Que., plasterers, are stated to be sold.

The General Contracting Company, which had the contract for the grand stand at the Exhibition grounds here, has assigned, it is reported, to E. R. Clarkson, of Toronto.

Work has been suspended for the season by the survey party which has been examining into the feasibility of a waterway from Lake Winnipeg to Edmonton by the Saskatchewan river, and the surveyors are now on their way home. While the work is not yet finished the interim reports are understood to demonstrate the comparative feasibility of the new grain route by water, but detailed estimates of cost have not yet been figured out.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The KATIE Foundry,
Galt, Ont.

Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

New Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

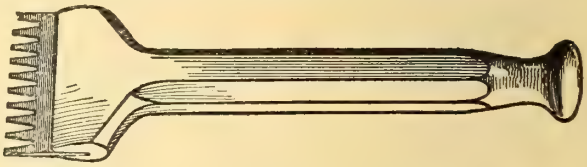
Maple Flooring

We have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.



The
"Simplex" Stone and Marble Cutter

Does away with sharpening of tools. When the teeth are worn replace with a new blade. The new blades are cheaper than sharpening, and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

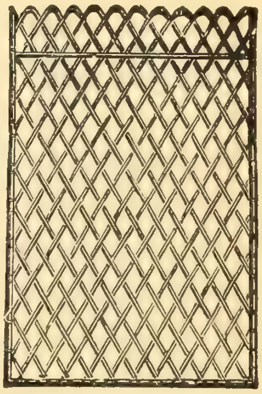
Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc., has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application. Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

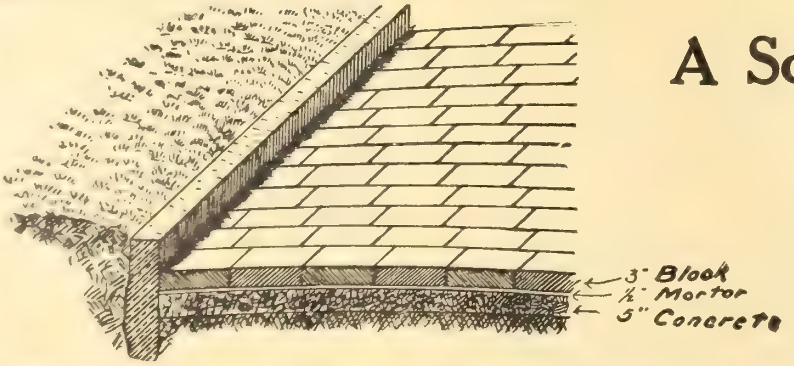
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by
Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?

PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists
London, Canada

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.

Metropolitan Building, NEW YORK.

Local Agents in Montreal, Toronto and Ottawa.

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

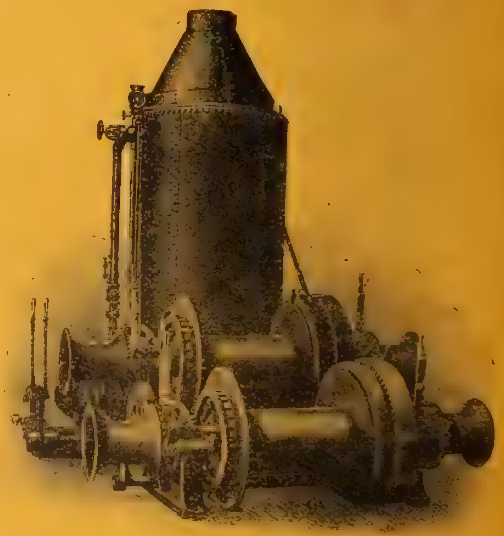
Georgian Bay Shook Mills
Limited
Midland, Ontario

"Some Equipment With Merit"

FOR THE CONTRACTOR

Hoisting Engines

of all sizes



For
Contractors
Quarrymen
Bridge Builders

Railroad, Dock and Sewer Construction; Dredging, Hauling Erecting and Driving; Ships, Mines, Docks, etc., etc.

ELECTRIC HOISTS BELT HOISTS

"Ransome" Concrete Mixers

in all sizes — all styles of power
"The best mixer to be obtained"

We are now offering a No. 4 Ransome, suitable for all classes of small work.

It will pay you to investigate

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec Dunn Bros., Winnipeg Ritchie Contractors Supply Co., Vancouver

Vol. 24 Toronto, November 9, 1910 No. 45

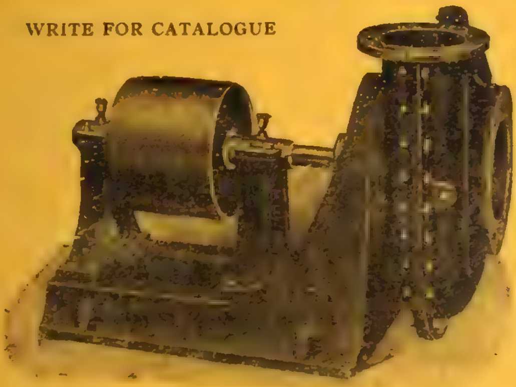
ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE



The **Smart-Turner Machine Company**
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

Gives A Bright Appearance

"Queen's Head"

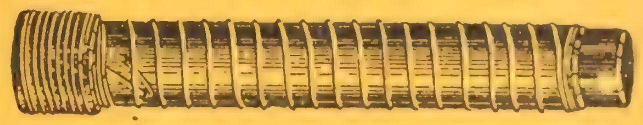
CANADA

Galvanized Iron

One Contractor says: "It is a pleasure to look at "QUEEN'S HEAD" work.

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

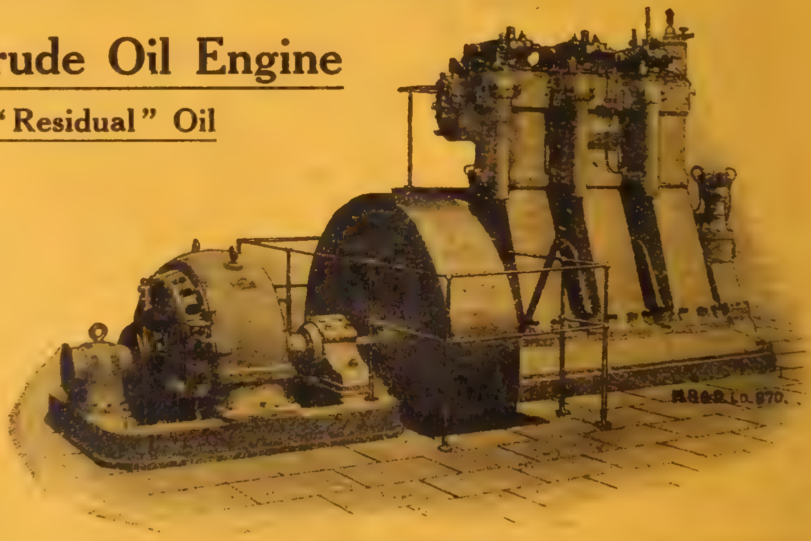
Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breaksdown
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canada Wire Goods Mfg. Co 54
Dennis Wire & Iron Works 10

[illegible]

Federal Engineering & Supplies Ltd 51

Boilers

Inglis, John 24
Jenckes Machine Co 2
Leonard & Sons, E 55
Marsh & Henthorn 51
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co
Waterous Engine Works Co

Brick

American Enamelled Brick Co
Canadian Pressed Brick Co 55
Don Valley Brick Works 7
Hamilton Pressed Brick Co 10
Milton Pressed Brick Co 18
Port Credit Pressed Brick Co 55
Toronto Pressed Brick Co 34

Bridges (Steel)

Canadian Bridge Co 52
Cleveland Bridge Co 52
Dickson Bridge Works 57
Dominion Bridge Co 52
Phoenix Bridge and Iron Works 53
Pennsylvania Steel Co 52

Builders' Hardware

Taylor-Forbes Co

Cement

Alsen Portland Cement Co 62
Britnell & Co 20
Bremner, Alex 59
Canada Cement Co 3
McNally & Co., W 55
Morrison & Co., T. A 60
Rogers, Alfred 4
Rogers Supply Co 31

Conduits Page

Conduits Co., Limited 59

Concrete Pipe

Lock Joint Pipe Co 19

Concrete Mixers and Machinery

Canada Foundry Co 13
Cropp Concrete Machinery Co 6
Goold, Shapley & Muir 9
Hopkins & Co., F. H 64
Jenckes Machine Co 2
London Concrete Machinery Co 23
Mussens Limited 32
Morrison & Co., T. A 60
Rogers Supply Co 31

Concrete and Steel Reinforcements

Ambarsen Hydraulic Construct'n Co. 61
Buffalo Steel Co
Canada Wire Goods Mfg. Co 54
Hamilton Iron & Steel Co 22
Trussed Concrete Steel Co 5

Contractors' Plant

Beatty & Sons, M 54
Factory Products Limited
Hepburn, John T 17
H & E. Lifting Jack Co 53
Hopkins & Co., F. H 64
Katie Foundry Co 61
Marsh & Henthorn 51
Meaford Wheelbarrow Co
Mussens Limited 32

Crushers (Stone and Rock)

Hopkins & Co., F. H 64
Jenckes Machine Co 2
Mussens Limited 32
Morrison & Co., T. A 60

Corrugated Iron

Galt Art Metal Co 20
Metallic Roofing Co 51
Metal Shingle and Siding Co
Ormsby, A. B., Limited 5
Roofers Supply Co 59

Contractors Page

McIlwraith, Jas. A 60

Drills

Beatty & Sons, M 54
Canadian Rand Co 1

Deafening Felts

Cabot, Samuel, Inc 55

Drilling Contractors

Harvey, J 61

Dredges

Beatty & Sons, M 54

Engines

Canadian Boving Co 2
Inglis, John 24
Jenckes Machine Co 2
Leonard & Sons, E 55
Mussens Limited 32
Waterous Engine Works Co

Excavators

Harris, J. W 11

Electrical Apparatus and Supplies

Factory Products Limited
Northern Electric & Mfg. Co

Engineers (Civil and Mechanical

Barber & Young 60
Chipman & Power 60
Bowman & Connor 60
Farmer, John T 60
Fuce, Edw. O 60
Galt Engineering Co., John 60
Glaubitz, H. J 60
Hunt & Co., Robt. W 55
Inglis, John 24
Kennedy, Jas. C 60
Lea & Ferguson 60
Mace, T. Harry 60
Mitchell, C. H 60
McRae, John B 60
Moore & Scollan 60
Nadel & Adler 60

Fire Apparatus Page

Factory Products Limited
Morrison & Co., T. A 60
Seagrave, W. E 16

Fireproof Doors and Windows

Douglas Bros 14
Mussens Limited 32
Ormsby, A. B 5

Granite and Marble

Laurentian Granite Co 60
Missisquoi Marble Co 21
Rogers Supply Co 31
Smith Marble & Construction Co 23

Glass

Chance Brothers & Co
Consolidated Plate Glass Co
Luxfer Prism Co
Thompson & Co., B. & S. H
Toronto Plate Glass Importing Co 1

Heating Apparatus

Jenckes Machine Co 2
Leonard & Sons, E 55
Taylor-Forbes Co

Hoisting Machinery

Beatty & Sons, M 54
Factory Products Limited
Inglis, John 24
Jenckes Machine Co 2
Hopkins & Co., F. H 64
London Gas Power Co 63
Marsh & Henthorn 51
Mussens Limited 32

Hydrants

Canada Iron Corporation 59
Gartshore-Thomson Pipe Co 58
Kerr Engine Co 8

Interior Fittings

Lickleys Limited 22

Lime

Christie, Henderson & Co 17
Jamieson Lime Co 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

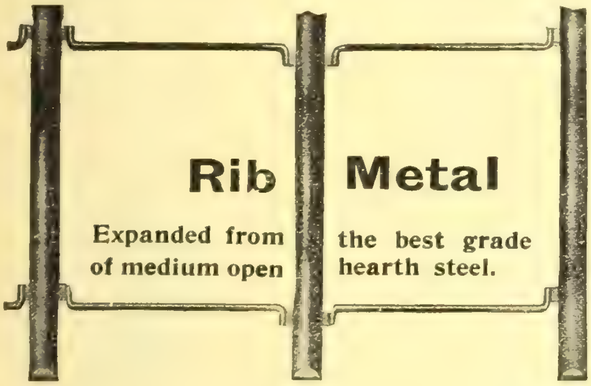
ALFRED ROGERS

PHONE MAIN 4345 **28 King Street West, TORONTO**

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.

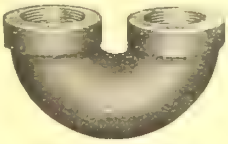

Rib Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

Semi Steel Fittings

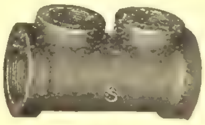


RETURN BEND

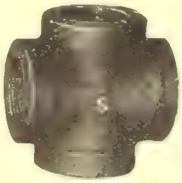
PIPEHANGES

Y BRANCH

REDUCER



HEADER



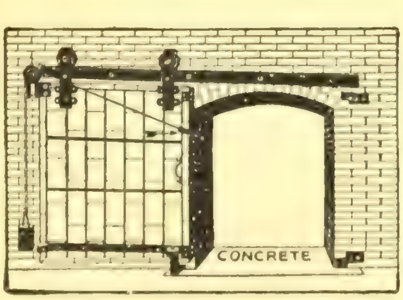
CROSS

A fitting for every purpos
TRY THEM

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

It is for Your Benefit we Label our Doors

Substandard Doors cost less money to make but mean a lesser Insurance allowance. **Proportionately, Labelled Doors give much larger returns** through Insurance allowance than do unlabelled goods.



Specify Ormsby "Underwriters" Fireproof Doors. Get all that is coming and the most for the money invested.

Experts in Fireproof Windows, Doors and Skylights.

A. B. ORMSBY, Limited
Factories:

Cor. Queen & George Sts.
TORONTO

677-81 Notre Dame Ave. W.
WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	16
Delaplante, Ltd	40
Eaton & Sons, J. R.	23
Georgian Bay Shook Mills	63
Rhodes Curry & Co	
Sanitary Floor Co	62
Semon Bros	57
Tilson Co	50
Woodstock Lumber Co	62

Metal Lath

Galt Art Metal	20
Metallic Roofing Co	51
Noble C W	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co.	54

Paving and Paving Materials

Dominion Carbolineum Works	12
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	
Britnell & Co	20

Pipe

Canadian Pipe Co.	58
Dominion Wood Pipe Co	9
Gartshore-Thomson Pipe Co.	58
Municipal Construction Co.	16
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co.	
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	16

Pumps and Pumping Machinery

Beatty & Sons, M.	54
Goulds Pump Co.	
Hopkins & Co., F. H.	64
Inglis Co , John	24
Leonard & Sons, E.	55
Martin Steam Pump Co.	57
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	53
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials

Barrett Mfg. Co.	
Galt Art Metal Co.	20
Metallic Roofing Co.	51
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies

Factory Products Limited	
Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	58
Climax Road Machine Co.	18
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	20
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	31
Standard Drain Pipe Co.	56

Sand

Rogers Supply Co.	31

Stone

	Page
Britnell & Co.	20
Christie, Henderson & Co.	17
Consolidated Stone Co.	63
Contractors' Supply Co.	
Corinthian Stone Co.	54
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	53
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	11

Structural Iron and Steel

Buffalo Steel Co.	53
Dominion Bridge Co.	52
Eastern Canada Steel Co.	15
Hamilton Iron & Steel Co.	22
MacKinnon Holmes & Co.	53
Pennsylvania Steel Co.	52
Phoenix Bridge & Iron Works	53
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H.	53

Shovels (Steam)

Beatty & Sons, M.	54
Canada Foundry Co.	13
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Smoke Stacks

Leonard & Sons, E.	55

Safes and Vaults

	Page
Taylor, J & J	

Stone Cutters

Bailey-Underwood Co.	62

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	23

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	59
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	53

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	8
Marsh & Co, Jas.	54
Standard Fitting & Valve Co	5

Ventilating System

Gardiner & Gaskill	58

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	54

Water Wheels

Canadian Boving Co.	2

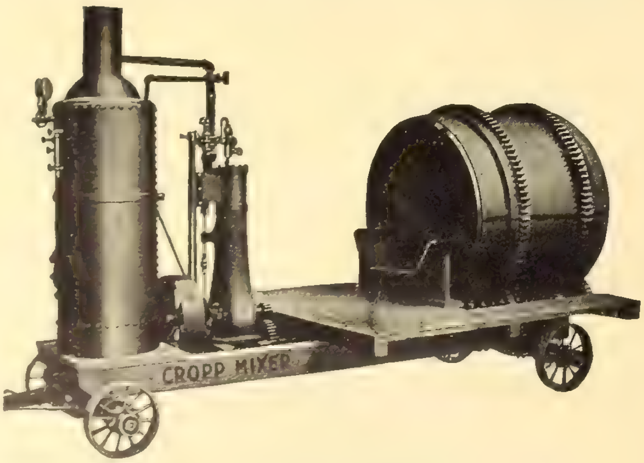
Wire and Cable

Factory Products Limited	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co.,

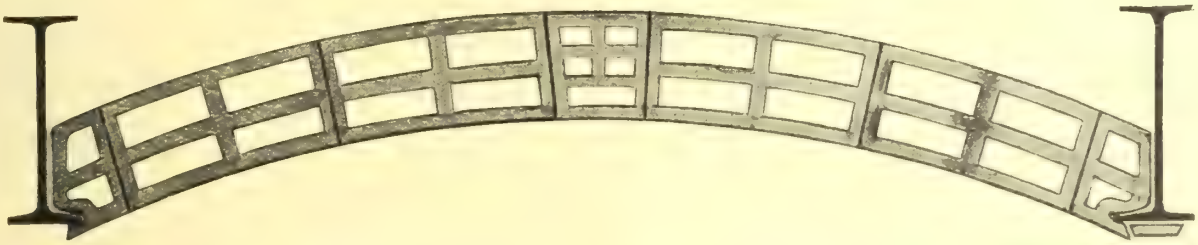
84 Lasalle Street,
Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

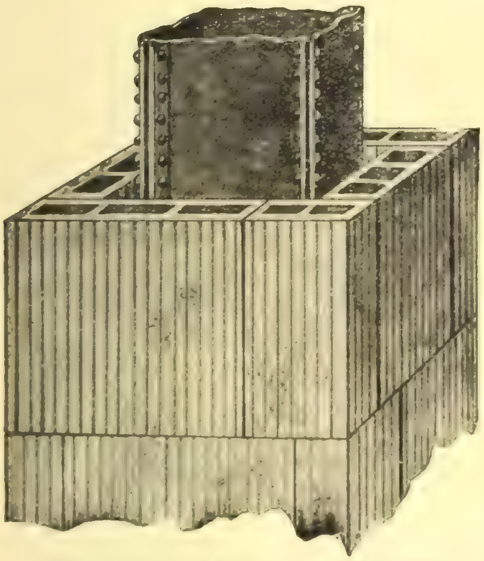
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

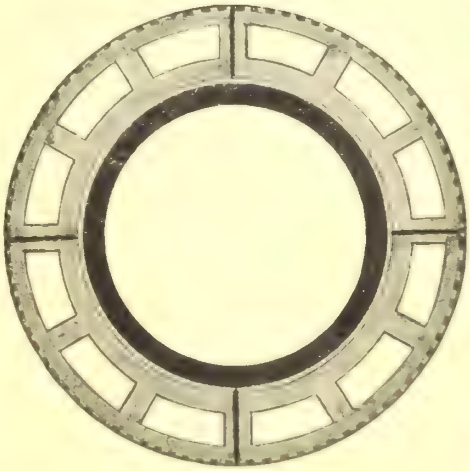


Section showing style of Skewbacks and Keys

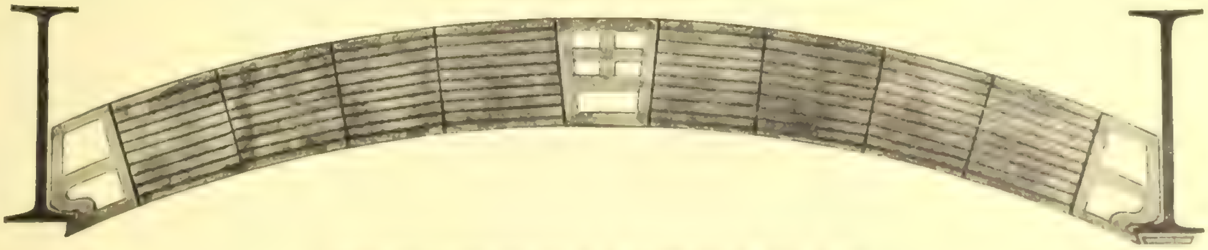


Perspective of Column Fireproofing

Don Valley Fireproofing is the best that can be obtained, because it is thoroughly burned, made in any weight required and has a minimum of waste. This fireproofing has been used extensively throughout the United States in preference to the American product because of the above advantages.



Type of Column Covering



Section showing style of Skewbacks and Keys

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

KERR

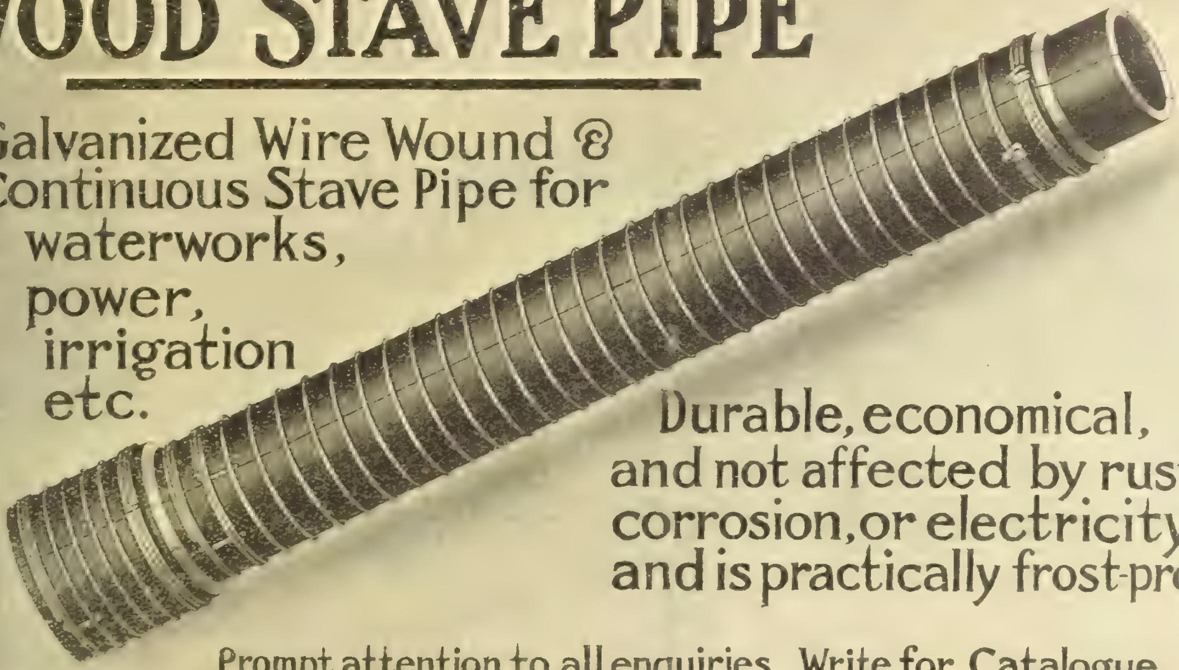
Valves and Hydrants

are used by cities and towns in every part of the Dominion. They have a reputation built up by years of long and satisfactory service. YOUR municipality should specify "KERR" for all waterworks' contracts.

Unsurpassed in
Workmanship
Design
Material
Efficiency

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

WOOD STAVE PIPE



Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send
for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

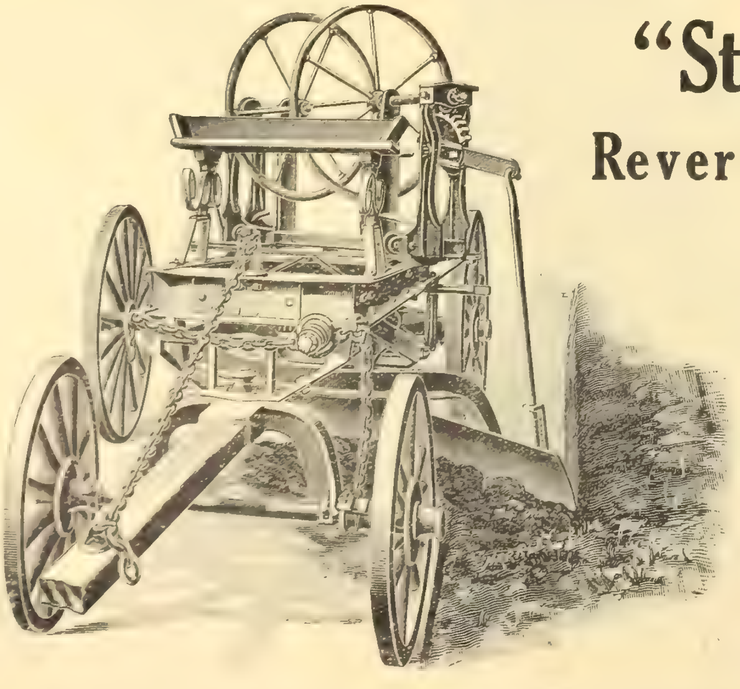
Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY If You Do Your Road Making With a



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

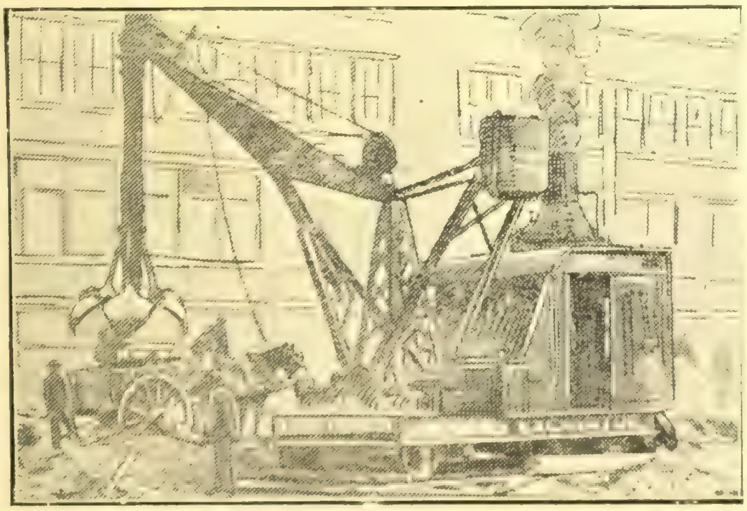
Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

For further information apply:

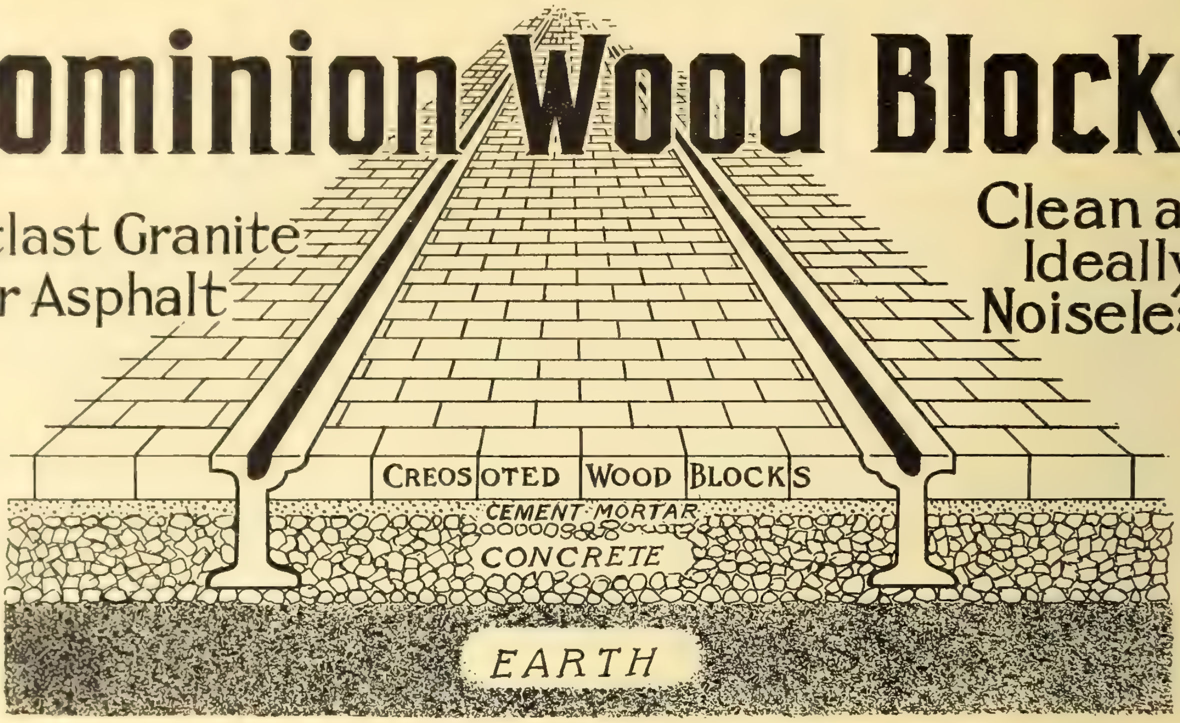
J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks

Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless



THE IDEAL PAVEMENT

Dominion Creosoted Wood Blocks are recognized as the ideal material for pavement construction.

THE REASON WHY

They are not affected by extremes of temperature

They are easily cleaned.

Can be laid by unskilled labor with ordinary tools.

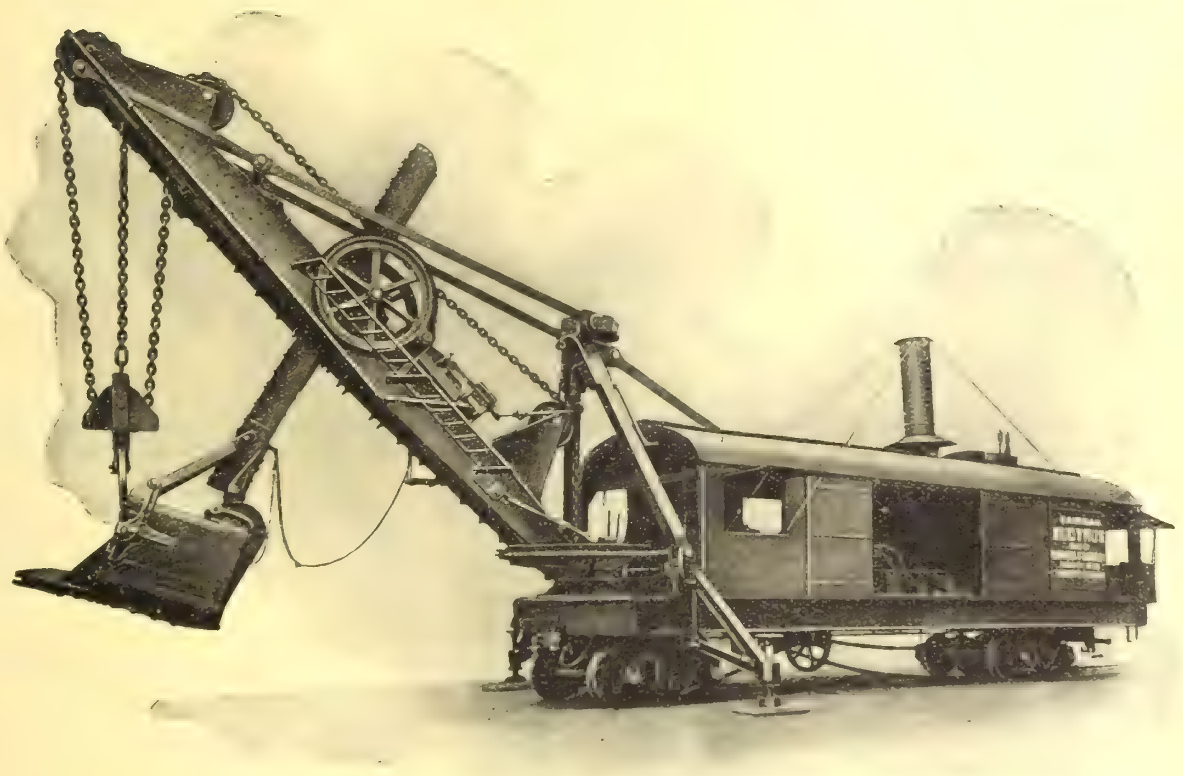
Parts of the pavement may easily be taken up in order to effect water, sewer and gas connections and relaid so perfectly that the junctions cannot be discerned.

Dominion Creosoted Wood Blocks are made from close grained Douglas Fir of first growth, the best the market affords. There is no better material for the purpose than Douglas Fir; if there were, we would use it.

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

Canadian Bucyrus

Steam Shovels



Made in Canada

Built to withstand the severest service and to handle large quantities of material for long periods of time

Design and construction throughout of the highest class

Send for our new Bulletin No. 37

Canada Foundry Co., Limited

Head Office, TORONTO

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipe

There is no good substitute for
VITRIFIED CLAY Pipe

OF

"MIMICO" BRAND

will reflect credit on the contractor who lays them.

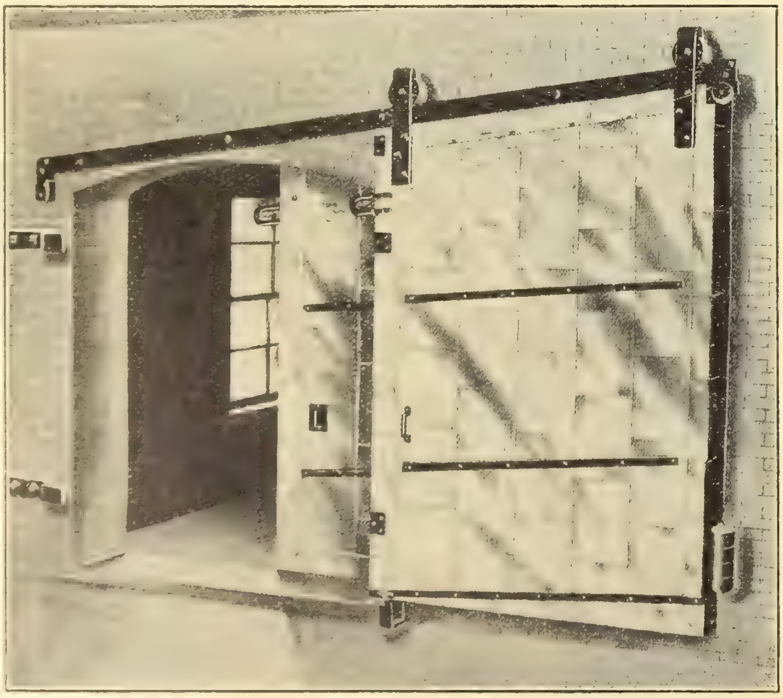
To make a good job, you must have good material.

Your pipe will be right if they come from MIMICO.

Sizes 4" to 24" inclusive.

Single and double strength.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many of the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P. Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

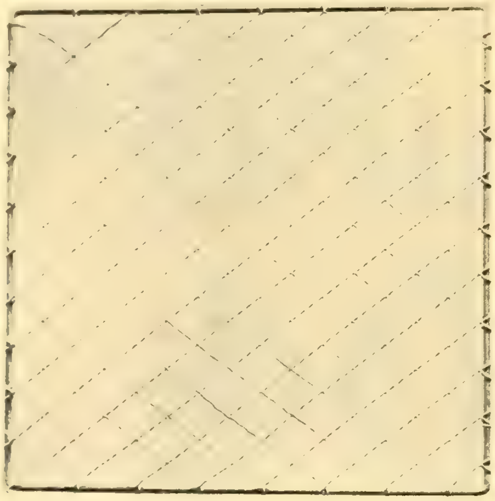
Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

The Largest Cities and Smallest Towns use

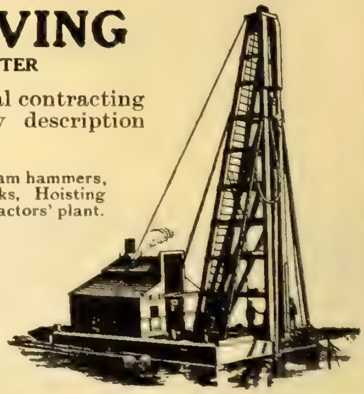
W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.



PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

**Reinforced
Concrete
Construction**

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

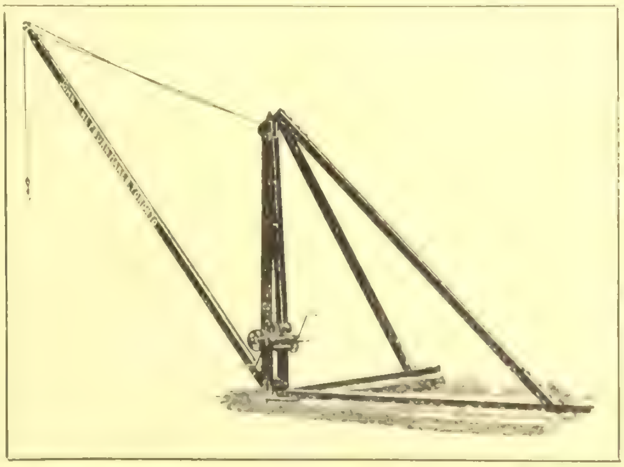
Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

No Better Derricks on the Market

Men who know the comparative value of Derricks will tell you that for all kinds of construction work there's nothing better made than

**John T. Hepburn
Scotch Derricks**

They are made in standard sizes ¼ ton upwards this means that any part can be replaced at short notice. Are fitted with single and double purchase gears changeable in a moment from one to the other powerful band brake, and an ample length of first quality wire rope. The special safety catch locks the boom and prevents accidents. They may be operated either by hand or power.



These derricks are in use by leading contractors in all parts of the country. If you have any use for a Derrick it will pay you to investigate our line. Write to-day.

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

THE MILTON PRESSED BRICK Co. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

Climax Hoisting Engine

to operate our Climax Material Elevator illustrated last week

Our customers are proofs of satisfaction

Copy of testimonal received from Messrs, John Poag & Co. Ltd., Hamilton

Hamilton, Oct. 18th, 1910

The Climax Road Machine Company, City

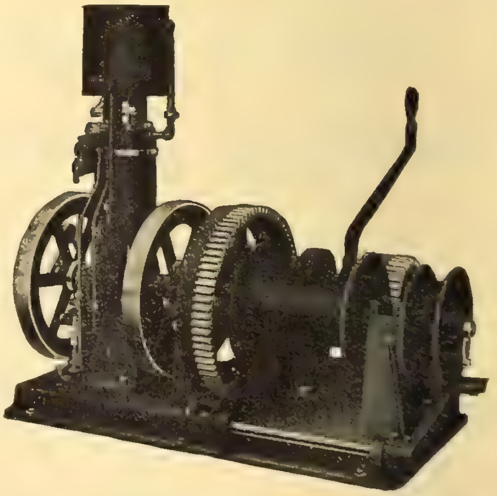
Gentlemen :—

We have pleasure in writing you of the success of our Gasoline Hoisting Engine, which we have been using for two months and which has been giving entire satisfaction. We are running it every day hoisting timbers and lumber of all sort up on a four story factory building for the International Harvester Company. We have taken up Georgia Pine Timber 8″ x 18″ x 16′ can take up twelve pieces 3 x 8 x 18′ without the least tronble : as the machine is light and on wheels we can move it around the building very easily. We would cheerfully recommend this machine to any contractor wanting a machine of this kind.

Yours Truly, (sgd.)

John Poag & Company Limited

Catalogues cheerfully furnished



(Can be equipped with gasoline, steam or electricity) as required.

The Climax Road Machine Co.

Hamilton, Ont.

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

45 inch and 42 inch Pipe for Brantford, Ontario

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

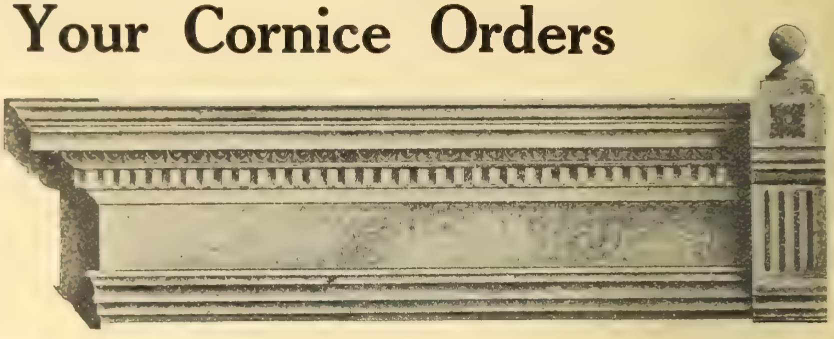
Write for Illustrated Catalog

WINNIPEG, MAN. F. H. McGavin Co., Ltd.
SEATTLE, WASH. Pacific Lock Joint Pipe Co.
LOUISVILLE, KY. Harris Engineering Co.
MONTREAL, QUE. Francis Hankin
CHATTANOOGA, TENN. Howard Egleston
HAVANA, CUBA. Huston Concrete Co.

Send Us Your Cornice Orders

"Galt" Galvanized Iron Cornices are made on a 1909 model Ohl Power Press by men with years of international experience in this line. They fit accurately.

Prices right. Deliveries prompt. Let us quote on your requirements in **Cornice, Skylights or Fire-proof Windows.**



The Galt Art Metal Co., Limited, Galt, Ontario

Herringbone Metal Lath

is sold to intelligent purchasers by reason of its superior quality, not its low first cost.

The use of the superior article results in a saving in amount of lath used, a saving in cost of erection, a saving in cost of plaster, and a saving in carpenter work. Any one of these savings alone would justify the Herringbone price.

The total saving explains why we are doubling our capacity.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

Everything for the Builder

Sand and Gravel Screened, Pit Run and Pea Gravel Building Sand

We can also ship promptly, Building and Crushed Stone, Lime, Cement, Fire Clay, Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile.

LET US FIGURE WITH YOU.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Right Here in Canada

Architects and Contractors can obtain marble with all the richness and depth of color that is to be found in the finest imported product.

Missisquoi Marble

is quarried in six distinct varieties which afford excellent opportunities for following out beautiful color schemes.

Light Grey
Dark Grey
Green Grey

Cream with Green Vein
Cream with Mottled Green
Cloudy Green and Pink

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver, B.C.
General Contractors' Supply Co., Halifax

The Hamilton Steel & Iron Co.
Hamilton - Canada
LIMITED

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

This is a picture of our factory at Gravenhurst, which we are devoting exclusively to the manufacture of bank, office, church, school and general interior fittings for houses. We make a specialty of architects details and can guarantee with confidence to please our customers.

We manufacture our own lumber and our panel stock is cut from the log as such, thus doing away with the chance of panels buckling.

If you intend estimating on any contracts where there is any details, send us blue prints and specifications and we will give you our best price. It may not be lowest but we will guarantee it will be the best in the end.

The heads of our departments are all men of large experience in this line and the head of the firm has had thirty years practical experience. We cannot offer you more than this and we think you will not want more. Architects will do well to put our name on their list for all kinds of high class interior fittings and furniture.

LICKLEYS LIMITED Mail Building
TORONTO

The Calkins Tile & Mosaic Co., Limited

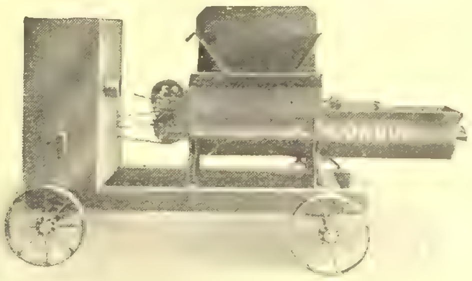
Wall Tiles, Hexagon Floor Tiles, Quarries, Ceramic Mosaic, Marble Mosaic

Interior Marble, Slate and Granite Work

The
Smith Marble & Construction Company, Limited

458 Bleury Street, Montreal

London Automatic Batch Concrete Mixers



Made in two sizes

No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money
- **On the first cost of machine**
- **On cost of operation**
- **On cost of mixing concrete**

OUR AUTOMATIC MIXERS do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired.

We also manufacture a STANDARD DRUM BATCH MIXER in three sizes, one third yard, one-half yard and one yard. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company Limited
19 Marmora Street, London, Canada

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, its officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

1200-1210 Morton Bldg. - CHICAGO, ILL.

Mixed Cars

We make a specialty of mixed cars of builders' material.

SASH, DOORS (pine or veneered hardwood), **MOULDINGS, CEILINGS, FRAMES, EMPIRE BRAND HARDWOOD FLOORING, STAIRS,** etc.

These materials are strictly high grade and will give a FINISH to house that is sure to please even the most critical.

J. R. Eaton & Sons
Limited

Orillia, Ontario

Montreal Agent:
The [illegible] Flooring Co., 55 St. Francois Xavier St.

Heavy Plate Work

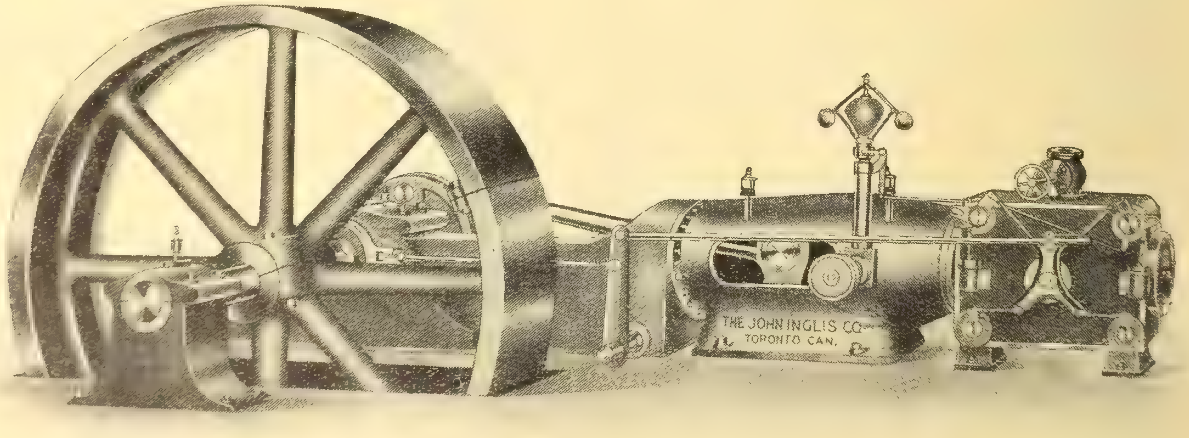
We Manufacture and Erect:

- Stand Pipes
- Penstocks
- Water Tanks
- Dryers
- Fertilizers

100,000 GALLON WATER TANK,
built and erected by us for the Michigan Central Railway at Waterford, Ont.

- Blast Furnaces
- Flumes
- Smoke Stacks
- Special Machinery
- Plate Work of all kinds

"INGLIS" Corliss Engines built for a purpose, to last a life time


THE JOHN INGLIS CO.
TORONTO CAN.

Every Engine guaranteed to do just as represented.
Write us for particulars.

The John Inglis Company Limited

ENGINEERS AND BOILERMAKERS

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Fredericton, N.B.

The city council has decided to begin operations on waterworks extension to Bailey's bridge next year.

Kincardine, Ont.

The ratepayers will vote in January on a by-law to spend $7,000 on septic tank and trunk sewer.

Montreal, Que.

Tenders addressed to the Board of Commissioners will be received until Nov. 15 for construction of sewers in Tenth avenue, Rosemount, from Masson street to Cote Visitation road. Information with City Surveyor, I. N. Senecal, secretary.

Point Grey, B.C.

When the plans and specifications are completed the council will ask for tenders for the installation of waterworks system. Cleveland & Cameron are the engineers in charge. Their plans show a system of waterworks that is designed to serve the needs of the municipality for a long time to come. Tenders will be called for the construction of one of the reservoirs, The system will entail a total expenditure of about $250,000. Steel pipes will be used. Mr. Bowser, reeve.

St. John, N.B.

The Canadian Fairbanks Company was recommended for tne contract for the 8 and 4 inch pipes for the hospital at $85.23 and $30.20 per 100 feet, and T. McAvity & Sons, Limited, the 6 inch size for $47.

St. Stephens, N.B.

Until Nov. 30th tenders will be received for $25,000 36-year, 4 per cent. waterworks, and $15,000 30-year, 4 per cent. consolidated debt debentures. J. T. Whitlock chairman finance committee; J. Vroom, town clerk.

Trail, B.C.

Until Nov. 21st tenders will be received for $15,000 6 per cent. 20-year waterworks debentures. W. E. B. Monypenny, city clerk.

Toronto, Ont.

Tenders are being called until Nov. 15 for construction of sewers in various streets. G. R. Geary, chairman Board of Control.

Vancouver, B.C.

The ratepayers will vote on January 11 on the expenditure of $500,000 for sewer extension.

Victoria, B.C.

Negotiations are on between the Columbia Bitulithic Company, Limited, and the owners of a private estate in Victoria, for the construction of 14,000 yards of bitulithic pavement. Frederick C. Beckett, representative.

Weston, Ont.

This municipality has under consideration the treatment for purification of the supply of water. Two methods have been suggested, one of sand filtration, the other of mechanical filtering.

Winnipeg, Man.

A magnificent driveway belting the whole city, 24 miles in length by 120 feet wide, is being planned. The parks board would undertake the management of the enterprise, which it was estimated would not cost the city more than $20,000. Mr. C. W. Sharpe, chairman.

AWARDED.

Belleville, Ont.

Messrs. Thompson & Donahue were given the contract for constructing a sewer on Pinnale and Church streets, the lowest tender.

Victoria, B.C.

The contract supply of brass goods, fittings, galvanized iron pipe, etc., was awarded to Miller, Limited, London, Ont., at $12,636. Five other tenders were received.

Railroads, Bridges and Wharves

Burke's Head, N.S.

Tenders are being called until Nov. 22 for construction of breakwater here by the Public Works Department, Ottawa. R. C. Desrochers, secretary.

Lorneville, N.B.

Tenders are being called until Nov. 23 for extension to breakwater here by Public Works Department. R. C. Desrochers, secretary.

Montreal, Que.

A delegation composed of Messrs. R. W. Reford, Col. J. H. Burland, Mr. Geo. Haddrill, secretary Board of Trade, and others will wait upon the Federal Government to ask for a first class dock instead of the second class one which it is understood has been granted.

Regina, Sask.

In regard to apportionment of cost of subway under C.P.R. tracks, according to the order of the commission, the city is to do all the excavating and paving and erect all the substructures, drains and lights. The C.P.R. is to erect all the superstructures and to provide such land as is necessary for the approaches. A year is given as the time within which the subway is to be built. It is roughly estimated that the cost will be to the city about $150,000 and to the railway company about $100,000.

Sifton, Man.

Tenders are being called until Nov. 10th for erection of truss bridge, 42 feet, with approach, etc.; for erection of a 50-foot span of a Howe truss bridge, renewing part of a bridge now spanning the Assiniboine river on Sec. 36 9-24. Contractors to furnish material. Plans, etc., at Department of Public Works, Winnipeg, R. H. Hockin, secretary treasurer.

Victoria, B.C.

The Indian Reserve having been taken over, it is stated, the C.P.R. will at once arrange for extensive terminal facilities on the site to accommodate the E. & N. Railway.

The Department of Works is taking up the matter brought before Premier McBride of a railway from Banff into the upper Columbia valley and the undertaking will be rushed forward next year. This road will not only be a fine scenic route but will also open up a splendid section of country which will no doubt be quickly filled with settlers.

AWARDED.

Dipper Harbor, N.B.

Mr. Thomas P. Charleson has been awarded the contract for a breakwater and wharf extension here.

Goderich, Ont.

The contract for an extension of 600 feet to the breakwater outside the harbor has been let to Michael Connolly, Montreal.

Kingston, Ont.

The C.P.R. have given a contract for ten 10-wheeler engines to the Canadian Locomotive Works here.

Ottawa, Ont.

The contract has been awarded to Stewart & Hewitson, Port Arthur, for the construction of a steel and concrete bridge over the Ottawa river at Ottawa, $300,000.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

This city in all probability will make application at the next session of the legislature for the establishment of a permanent Normal School here.

The Asylum for the Insane was destroyed by fire on the 4th inst.

Calgary, Alta.

The city engineer has been instructed to prepare plans at once for a $50,000 market building to be built on the Birnie site. It is proposed to have the building two storeys high and with a full basement.

Calgary, Alta.

Building Inspector McClellan has been instructed to have plans prepared for the improvements to the high school which will cost about $43,000. Tenders will be asked for 12 and 8-roomed schools. The erection of the cottage schools has been arranged for. Tenders close by the 16th November.

The advisability of erecting a modern incinerator is being considered. It is planned to [illegible] incinerator with blast furnace with a capacity of [illegible]. The cost of such a one would be [illegible].

Charlottetown, P.E.I.

C. B. Chappell, architect, this city, has plans prepared for the following: [illegible] city jail, brick and stone, [illegible] addition to drill hall and armories.

Estevan, Sask.

When plans are completed tenders for [illegible] will be called. Councillor [illegible] is interested.

Edmonton, Alta.

The following [illegible] comprise the building committee of the Boys' Brigade [illegible] Association: Mr. Wathenshaw, Geo. Sucklin, and W. C. Watson. Major Gries[illegible] and Archdeacon Gray are ex-officio members.

Montreal, Que.

The Stadium roller rink was destroyed by fire here on the 1st inst. Estimated loss, $[illegible]. It is stated it will not be rebuilt. Manager, Mr. Gauthier.

The Y.M.C.A., Dominion Square, has secured a building permit for 3-storey building, St. Viateur and Park avenue, $55,000.

The Board of Control have under consideration the acquisition of a site for a public library.

A committee has been formed, headquarters at Y.W.C.A., Dorchester street, for the purpose of erecting a business woman's hotel here. It is stated that the steamship companies will support the movement.

A new foundling hospital will be erected here. Estimated cost, $100,000.

Melfort, Sask.

The by-law to erect a new town hall was carried and construction work has commenced.

Midland, Ont.

The ratepayers will probably vote in January to raise $20,500 for a new school.

Ottawa, Ont.

Tenders for the new departmental building at Ottawa, estimated to cost between $2,500,000 and $3,000,000, it is stated, will be invited in December. The plans, which have been remodelled so that the building will not encroach upon MacKenzie avenue, are about finished, and notices have been served upon the tenants of properties on the site, to vacate by November 30.

Tenders are being called until November 10th for erection of building for testing laboratory, Cliff street, by the Public Works Department. R. C. Desrochers, secretary.

The Board of Control have again recommended the acceptance of the offer of Messrs. Laurie & Lamb to install an incinerator of the Heenan-Froude type, at a cost of $34,650.

A committee composed of Sir Louis Davies, Mr. W. L. Scott, Col. Irwin, Mr. J. Keane and Mr. A. Dion were appointed to look after the building of an addition to the detention home for the Children's Aid Society.

Proctor, B.C.

The members of the Church of England here are arranging to build a hall.

Swift Current, Sask.

A committee was appointed to consider the erection of a new Presbyterian church here. Rev. J. G. McKechnie, finance, etc.

Toronto, Ont.

The following recommendation was approved by the Canadian National Exhibition Board: That the City Council be requested to immediately arrange for the wiring of the grounds and buildings, according to plans submitted, at an estimated cost for buildings of $30,000 and for the grounds approximately of $50,000.

The Toronto Hunt Club House on Scarboro Bluffs was destroyed by fire on the 6th inst. Estimated loss on building, $50,000. It will be rebuilt. C. W. Clinch, chairman of the executive. A. O. Beardmore, Master of the Hunt.

Building permits were isued recently to the Board of Education for the following: Board of Education, three-storey brick school, near Robinson, on Manning avenue, $60,000; Board of Education, 2 storey brick school, near Quebec, on Humberside avenue, $50,000; Board of Education, 2 storey brick school on St. Clair and Oakwood, $150,000; Board of Education, 2 storey brick school, on east side Ossington, near St. Clair, $60,000; 3 storey brick school on Elizabeth and Chestnut, $57,000; 3 storey brick school near Clendennan, on Annette, $60,000; also Victoria University, 3 storey brick dining room and students' residence, on Charles street, $350,000.

Victoria, B.C.

The Order of the Eagles have under consideration the erection of a large 3-storey lodge building in the rear of St. Johns church here.

Vancouver, B.C.

The site for new theatre, corner of Seymour and Dunsmuir streets, is ready for excavation for the foundation. Tenders will be called for the construction of the building. G. J. Mackenzie, representative.

On January 11th of next year the ratepayers will vote on by-laws aggregating in value $3,000,000; $900,000 of which is for new schools.

The school board report that about $800,000 will be needed in the coming year for school accommodation. A by-law for this amount will probably be submitted to the ratepayers in January.

The Order of the Sacred Heart has acquired a site south of Shaughnessy Heights, on which eventually an academy will be erected. Rev. Mothers Mahoney and Cosker, of Montreal, have been here on a visit of inspection. Archbishop McNeil, this city, is interested.

The Nuns of St. Paul's Hospital will commence building operations shortly on a new building of stone, with frontage of about 300 feet.

Wolfville, N.S.

Plans have been prepared for a new Baptist church here, brick and stone, cost $35,000. C. B. Chappell, architect, Charlottetown, P.E.I.

Winnipeg, Man.

The school management and finance committees of the school board report the necessity in the coming year of three new schools on the following sites: Buell, Lenora and Ruby streets; district west of Wellington school; district between Strathcona school, and city limits.

It is thought that Mr. J. Sterm, the noted hospital architect of Chicago, and Dr. A. J. Douglas, the judges appointed to consider the competitive plans for the tubercular hospital, will also act in the same capacity on the competitive plans to be called for the infectious disease hospital, of which the cost is reported as $200,000.

Tenders are called until Nov. 16th for supply of labor and materials required in the erection of public bath house to be located in Selkirk Park. Plans, etc., at office of W. Bruce, architect, 222 McDermot avenue. M. Peterson, secretary.

Westholme, B.C.

Tenders are being called by Minister of Public Works, Victoria, until Nov. 14th for erection of one-roomed school here. F. C. Gamble, Public Works Engineer.

Weyburn, Sask.

The synod of the Presbyterian church discussed the advisability of establishing a church here.

AWARDED.

Diamond City, Alta.

The contract for erection of new school here was awarded to James Patterson, $14,758.

Ottawa, Ont.

The contract for installing electric light fixtures in the city hall was recommended by the board of control to the Ottawa Electric Company, the lowest tenderer. Its tender on the specification, which called for imported material, was $2,270, but the company offered to supply Canadian goods, equally serviceable, for $2,004.

Stettler, Alta.

The contract for erection of school here was awarded to W. L. McKenzie & Company, Lethbridge.

St. Thomas, Ont.

Some of the contracts for the new $50,000 church to be erected here by the Holy Angels congregation has been awarded, as follows: Masonry work, Leslie & McNeil, of St. Marys; carpenter work, Pulleyblank, of St. Marys; slating, Chas. Riddell, St. Thomas.

Uxbridge, Ont.

We are informed that the following received contracts in connection with erection of public school here: carpentry, Jas. Snelgrove, Beaverton, $6,246; masonry, L. W. Marquis, Toronto, $5,600; heating, Kelsey Furnace Company, Brockville, $1,030; painting, M. Middleton, Uxbridge, $440; seating, Canadian Office & School Furniture Company, Preston, $1,037. Architect, Jas. Walker, Toronto and Buffalo.

Welland, Ont.

The contract for the erection of the foundation of the new Welland Club has been let to the Builders' Lumber & Supply Company.

Residences

Charlottetown, P.E.I.

C. B. Chappell, architect, has prepared plans for residences for C. D. Weeks, Esq., and W. S. Louson, Esq.

Hamilton, Ont.

Building permits were issued to W. H. Northcott, erection of a brick dwelling, Spruceside avenue, for Mrs. J. M. Spackman, to cost $2,600, and J. M. Stirton, erection of two brick dwellings, corner Hazel and Cannon streets, $3,400.

Ottawa, Ont.

The following building permits have been issued recently: Wolf Shenkman, brick veneer double dwelling, Clarence street, $3,000; Fred Hunt, brick veneer dwelling, Preston street, $2,200; T. J. Somerville, brick veneer double dwelling, $3,000; single house, $2,000, Mutchmor street; J. G. Davidson, brick veneer dwelling, Powell avenue, $4,000.

St. Boniface.

Recent building permits include: J. A. Senecal, dwelling at the corner of College and DuMoulin street, $9,800; house on Masson street, $5,000, and an addition to another residence on Masson street, $2,800.

Victoria, B.C.

Building permit has been issued to Mrs. Emma Marshall for a dwelling to be erected on Harrison street, to cost $3,000.

Windsor, Ont.
The residence of Mr. J. Henry Smith on the river front above Walkerville was destroyed by fire on the 31st ulto. Loss, $4,500.

AWARDED.

Montreal, Que.
Contract for the masonry work in connection with an apartment nouse to be erected on St. Luke street for Messrs. L. W. Chaput & Fils, has been awarded to A. Filion & Frere, contractors, 347 Mountain street. Architect, G. A. Monette, 97 St. James street.

Business Buildings and Industrial Plants

Belleville, Ont.
The 3-storey brick storehouse, owned by ex-Mayor Graham, was destroyed by fire on the 6th inst. Loss, about $25,000.

Calgary, Alta.
It is stated that an eight or ten-storey block, of brick, steel, stone and concrete, will be built here shortly, and that Mr. Jas. Ross, of Montreal, and Senator Lougheed are behind the project.
street, $21,500.

D. W. Rathvon is intending to build a business block to cost $5,000 on the corner of Centre street and First avenue.

It is stated that the Ottawa Furnace Manufacturing Company have under consideration the location of a warehouse here.

The Board of Trade has received an inquiry as to local conditions from a Seattle firm that proposes to come here and establish an acetyline gas making plant.

Fort William, Ont.
It is stated that all preliminaries having been satisfactorily concluded for the taking over of the Superior Rolling Mills Company by the Steel Company of Canada, work on the plant will be started in the spring. James Murphy, president of the Board of Trade; G. A. Coslett, chairman Industrial Bureau.

Goderich, Ont.
The G.T.R. station here was destroyed by fire on the 6th inst. Estimated loss, about $25,000.

Gilbert Plains, Man.
Damage to the extent of about $10,000 was done to the postoffice block here. J. R. Hart was among the losers.

Gananoque, Ont.
The Ontario Wheel Works was destroyed by fire on the 3rd inst. Estimated loss, $150,000.

Hanover, Ont.
The chair factory here was destroyed by fire on the 4th inst. Mr. Diebel, owner; estimated loss, $8,000.

Harriston, Ont.
A by-law has been passed granting a free site and factory building to the Canada New Shoe Company, Limited.

Halifax, N.S.
The Union Bank of Canada will take over the Duffus building on Granville, Hollis and Buckingham streets and alterations will be made at once.

It is reported that the Royal Bank of Canada has purchased the building on the northwest corner of Buckingham and Barrington streets where a brick or stone branch building will be erected.

Ingersoll, Ont.
A new station for the T.L.E. & P. Ry. will be built on the corner of Carnegie and Thames streets. Estimated cost, $3,000.

Midland, Ont.
It is probable that the ratepayers will vote in January on the granting of a fixed assessment to a flour mill company who purpose establishing a flour mill here.

Mount Brydges, Ont.
The flour mill near here, owned by Mr. Joseph Clark, was destroyed by fire on the 3rd inst.

Moose Jaw, Sask.
Application has been made to council by Mr. Williamson Clark for approximate prices on property on which it is his intention to erect an implement distributing warehouse, $12,000.

It is reported that the Moose Jaw Pressed Brick Company will build a plant of which the estimated cost is, including machinery, about $100,000.

Montreal, Que.
The preliminary plans for new station have been drawn up by the architects of the Grand Trunk Railway and will shortly be laid before Railway Commission for approval. All the property between the present station and Cathedral street has been purchased.

Mr. Hugh Paton, president of the Shedden Company, owners of the building on the northwest corner of Craig and Victoria square, will tear down the present building and erect a modern up-to-date structure.

Messrs. Findlay & Spence, architects, Guardian Association Building, have prepared plans for the new building to be erected on Notre Dame street. Work will not start until the spring. It is stated plans call for a large handsome building. Central Heat, Light & Power Co., owners (S. Carsley, president). Noted previously.

North Battleford, Sask.
The International Harvester Company will establish a distributing warehouse here, to cost $40,000. P. Lanz is local manager.

Ottawa, Ont.
The plant and equipment of the Peerless Brick & Tile Company at Billings Bridge has changed hands. Merckley Bros., of Casselman, have taken an interest in the business and have been entrusted with the active management. It is understood the plant is to be enlarged so that the output will be nearly doubled. New machinery has already been ordered.

Port Arthur, Ont.
The Ironclad Company, a branch of the Ironcald Company of New York City, will shortly start building operations here. It is stated they will employ about 300 hands.

Prince Albert, Sask.
The basement for the new hotel on the Goodfellow property recently purchased by Dr. Tripp of Vancouver, will be put in this year so that building operations may start next spring.

Pembroke, Ont.
A company composed of Jas. [illegible], president; J. G. Forgie, secretary-treasurer, will erect a box factory here at once, it is stated. Capitalization, $100,000.

Sellwood, Ont.
The Moose Mountain Mining Company, it is stated, will erect a new refining plant here. D. D. Mann, Toronto, J. W. Gates and Blair & Company, New York; Jas. Hutchison, Chicago, and Jos. Sellwood, Duluth, are among the directors.

St. John, N.B.
Plans for the proposed sugar refinery have been filed by F. R. Taylor, representing the proprietor, F. C. Durant. The plans show a group of five large buildings on an extensive scale.

It is reported that the Merchants Bank of Canada has secured an option on the Pugsley building at the corner of Prince William and Church streets. F. J. Shreve, local manager.

It is stated that the Thorne Wharf & Warehousing Company has purchased property situated on Walker's wharf, where a large warehouse will be erected to cost about $10,000.

It is announced that the Edward Partington Company will build a big paper mill in the near future. H. W. Schofield, secretary-treasurer.

South Vancouver, B.C.
It is announced that Mr. H. S. Hallenbeck will erect a 2-storey building, with frontage of 31 feet.

Smith's Falls, Ont.
The Canadian Cooperage Company, of Chatham, are stated to have decided to locate a branch here and erect their own buildings.

St. Thomas, Ont.
The by-law to loan $30,000, etc., to Monarch Knitting Company of Dunnville in return for locating a branch here was carried. The company will begin at once to erect a plant to cost $10,000.

Victoria, B.C.
H. Dallas Helmcken, K.C., representative for the owners, is having plans prepared for the erection of the business block to replace the Five Sisters Block recently destroyed by fire.

Messrs. David Spencer, Limited, will rebuild their business block destroyed by fire recently. Thos. Hooper, architect.

Messrs. Henry Young & Company will rebuild their building destroyed in the recent fire. W. Ridgway Wilson, architect, Bastion Square.

W. H. Charlton & Company will rebuild their store lately destroyed by fire.

Messrs. Moore & Scott have a building permit for 3-storey block on Douglas street, $21,500.

Vancouver, B.C.
Plans were filed by Capt. French with the building inspector for a three-storey block at the corner of Pender and Seaton streets.

Mr. D. H. McDougall has taken out a permit for a four-storey brick block on Hastings street east, between Westminster and Gore avenue, to cost $26,000. The work will be commenced immediately.

The Cottrel Storage Warehouse here was badly damaged on the 31st ulto., estimated total loss $100,000. Joint owners, G. H. Cottrel and C. M. Rolston.

Welland, Ont.
[illegible] was destroyed by fire on the 7th inst. Loss estimated at $15,000.

J. Rattray Wilson, Niagara Falls, Ont., is the architect for the erection of the [illegible] 40 x 80 and 60 x 100 feet) with wing 60 x 80. [illegible] 184 Welland, Ont.

Winnipeg, Man.
The [illegible] ald Company, Limited, on Market street

[illegible] was badly gutted by fire on the 1st inst. Total estimated loss, $125,000.

It is reported that Chas. E. Colling has prepared plans for a 6-storey business [illegible] here.

AWARDED.

Camrose, Alta.

W. E. Allen, local contractor, has received instructions from the Grand Trunk Pacific Branch Lines Company to proceed with the building of a station and freight sheds here.

Calgary, Alta.

The contract for excavation and foundation of business block for Wendell MacLean, was awarded to Hewson & Boney, Calgary, $9,000.

Murray Bay, Que.

We are informed that the Bishop Construction Company, Limited, Montreal and Toronto, have been awarded the contract for construction of water power development and pulp mill for the Eastern Pulp & Paper Company here, $296,000. Engineer, G. F. Hardy, New York.

Port Mann, B.C.

The tender of Messrs. John W. Moore and George H. Pethick, for the clearing of 1,000 acres of the townsite, was accepted. Work has commenced.

St. Stephen, N.B.

Ganong Bros., Limited, will have a new 4-storey wing added to their factory, giving additional space of 30,000 square feet. The new wing will measure 65 by 100 feet, four storeys high. E. B. Hanson has the contract for the erection of the foundation for the new building.

Windsor, Ont.

C. Howard Crane, 712 Ford Building, Detroit, Mich., has let the following contracts for a 2-storey automobile garage, 25 x 100 feet, for H. Trumbull, of Windsor: Masonry to Thompson Bros.; carpentry to W. Wallace; composition roofing, heating and plumbing to Blackman & Company; painting to O. Grandmaison. Contractors, of Windsor, Ont.

Winnipeg, Man.

The reported item in our last issue regarding the erection of warehouse in the rear of the Hudson's Bay stores is incorrect. According to the statement of John Woodman, architect for the Hudson's Bay Company, the work will be handled by the local firm, Carter, Halls, Aldinger & Co.

Power Plants, Electricity and Telephones

Creston, B.C.

A company, to be known as the International Electrical Company, Limited, with offices in Nelson and Portland, Ore., it is reported, has filed upon the waterpowers of the Pend d'Oreille river with a view of developing power from there. W. E. Moore, hydraulic engineer, of Spokane, reports favorably.

Coquitlam, B.C.

Coquitlam ratepayers will once again be required to vote on the Western Canada Power Company's light and power bylaw, it having been discovered that a mistake was made in the wording of clause 3 of the by-law as submitted on Sept. 20th to a vote in the municipality. The vote will take place on the 12th inst.

Dunnville, Ont.

A committee has been appointed to meet the Hydro-Electric Power Commission and private companies with a view to finding the most advantageous arrangements for light and power for this municipality.

Maple Creek, Sask.

This municipality will receive offers until November 10th for erection and installation of electric light and power plant and flour mill. D. Paterson, secretary-treasurer.

Ottawa, Ont.

A company has been formed of which the provisional directors include R. McElroy, M.L.A., Carp; F. A. Heney, Westboro; Ald. J. S. McCann, Kingston, and E. P. McGrath, Ottawa. A charter will be asked for to construct an electric railroad between Ottawa and Kingston, passing through Smith's Falls, etc. Mr. F. B. Proctor, Trust Building, Ottawa, is the solicitor.

The Ottawa, Rideau Valley & Brockville Railway Company announces that it will begin work at once building its proposed 60-mile railway from Ottawa to Brockville. Andrew Haydon, president.

Sherbrooke, Que.

The plans being prepared by Messrs. Ross & Holgate, Montreal, in connection with the development of the "drop off" water power on the Magog river are about completed. If they are adopted the carrying on of the work will mean a large expenditure, but when completed the city will have one of the finest water power plants in the Eastern Townships.

Toronto, Ont.

The city architect has issued to J. C. Eaton a permit for a power house to be erected on Davenport road, near Spadina road, at a cost of $5,800.

Tenders addressed to G. R. Geary, Chairman of the Board of Control, will be received until November 15th for supply of tungsten lamps. Specifications at office of Hydro-Electric System, Toronto.

Vancouver, B.C.

The B. C. E. R. Company will require about 122 cars of various types for their branches and the expenditure on rolling stock for ensuing year is estimated at about $500,000. General Manager Sperling.

AWARDED.

Murray Bay, Que.

See "Business Buildings. Awarded."

Ottawa, Ont.

See "Public Buildings Awarded."

Miscellaneous

Fort William, Ont.

The council will consider the advisability of submitting a by-law for approval in the January elections by which $60,000 will be appropriated for the purpose of giving the city better fire protection. H. S. Hancock, Jr., city engineer.

Montreal, Que.

Recent building permits include: Stewart Bottling Company, William street, a two storey factory building on William street, $7,000; M. Rodrique, 401 St. Emelie street, house containing three dwellings on Parc Cartier, $5,008; E. Joioin, 82 Buller street, a two storey house on Buller street, $2,000; George Nicholson, 1849 St. Catherine street east, house containing three dwellings on Joliette street, $4,000; Fabrique St. Stanislas, Boulevard St. Joseph and La Salle avenue, a church building, $26,800; J. Charette, 1113 Notre Dame street west, house containing four dwellings on Cartier street, $4,200; C. Desrochers, 1274 DeLorimier avenue, house containing three dwellings on Delorimier avenue, $6,000; E. Lavoie, 2172 St. Lawrence Boulevard, house containing two dwellings on Laurier avenue, $3,800; E. Comtois, 1896 Sanguinet street, two houses containing three dwellings and store on Cowan street, $3,000; Mde. A. Caron, 303 Esplanade avenue, a two storey stable building, $4,800; J. H. & J. E. Lafond, 2623 Esplanade avenue, four houses containing twelve dwellings on Mance street, $10,000; J. Robin, 578 Rivard street, house containing three dwellings on Ninth avenue, $3,000; C. Brunelle, 344 Beaubien street, two houses containing six dwellings on Parthenais street, $5,000; E. Lesperance, 1303 Des Erables street, house containing three dwellings on St. Urbain street, $7,000; W. A. Brown, 168 St. Andre street, house containing six dwellings on Melrose street, $3,000; R. Moner, 662a Clark street, two houses containing six dwellings on Dorchester and Cártier street, $4,000; A. Leonard, 2171 St. Urbain St., house containing three dwellings on St. Urbain street, $4,800; Young Men's Christian Association, Dominion Square, a 3-storey building St. Viateur and Park avenue, cost $55,000; Fabrique Notre Dame de la Defence, 966 St. Denis street, a church and school building on Sanguinet street, cost $9,000; Jos. Layer, 194 Lariviere street, house containing five dwellings on Sheppard street, cost $3,000; E. Sauriol, 291 Fabre street, house containing awo dwellings on Messier street, cost $2,000; F. Dansereau, 1211 Ontario street east, three houses containing nine dwellings on Chausse street, cost $6,000; Babcock & Wilcox, College street, a three storey building on Richelieu street, cost $10,000; Wm. Clark, 53 Amherst street, alterations to property to cost $2,000; C. Desjardins, 163 Laurier avenue, alterations to property on Gilford street, cost $3,000.

North Vancouver, B.C.

The specification for steam roller was 15-ton, and the estimates were as follows: Waterhouse Engine Company, Limited, Vancouver, $3,500; Buffalo Steam Roller Company, $4,250; Canada Foundry Company, $3,900; Mussels, Limited, gas motor roller, $3,290; Western Engineering Company, $2,860. The engineer was instructed to report on the various quotations.

Ottawa, Ont.

The Department of the Naval Service are calling for tenders until Nov. 30th for supply of clothing and kit for the naval service of Canada. G. J. Desbarats, secretary.

Toronto, Ont.

Steam heating by districts, doing away with furnace rooms in public and private buildings may be a development for Toronto in the not too distant future. For about a year or more a proposal has been before the Board of Control in the form of an application for a franchise from the Dominion District Steam Heating Company. Mayor Geary, Controller Ward, and the late Mr. J. N. McKendry were a subcommittee to look into the scheme. On Controller Spence's suggestions the city engineer was asked to make report on the whole question of a central heating plant.

Recent building permits include: A. F. Schnaifer, 3 storey brick addition to warehouse, on 41 McMurrich, $10,000; Mrs. J.

D. Wright, 2½ storey brick dwelling near Glen road on Highland, $9,500; E. G. Switzer, 2 pair semi-detached 2 storey and attic brick dwellings, near Sunnyside on north side Garden, $9,000; Houghton & Breeze, 3 attached 2 storey brick dwellings, near Lappin, on west side Dufferin, $7,000; National Electric Heating Company, 3 storey brick factory, near River on north side Queen, $14,000; Y. W. C. A., 4 storey brick boarding house on 76 Pembroke street, $25,000; Davidson & Company, 1 pair semi-detached 2 storey and attic brick dwellings, near Harboard on west side Crawford, $4,600; Wm. Dunseath, 2 pair semi-detached 2 storey brick dwellings, near Bloor on east side Shaw, $8,000; W. J. Grant, 2 pair semi-detached 2 storey brick dwellings, on 18-20, 24 and 26 Virtue, $8,800; A. D. Morrow, 2 storey brick dwelling on Balmoral avenue, $6,000; J. C. Eaton, 2 storey brick superintendent's cottage on Davenport road, $7,000; J. P. Hodgins, 2 storey and attic brick dwelling near St. Clair on Warren road, $8,000; Elder Carriage Works, Limited, 3 storey brick automobile factory southwest corner Soho and Phoebe, $12,000; G. A. McTaggart, 1 pair semi-detached 2 storey brick dwellings, on 402-4 Roncesvalles, $5,000; Dr. W. A. Scott, 2 pair semi-detached 2 storey brick dwellings, near Bloor on west side Dufferin, $5,000; Consolidated Optical Co., 1 storey brick warehouse, near Spadina on north side Richmond, $45,000; R. Burkell, 1 pair semi-detached 2½ storey brick dwellings on 45-47 Havelock, $5,000; Frank Taylor, 1 pair semi-detached 2½ storey brick dwellings on 182-184 Hepbourne, $5,000; B. J. Case, 4 pair semi-detached 2½ storey brick dwellings, near Brighton place an east side western avenue, $24,000; Elliott Manufacturing Company, 1 storey concrete factory on east side Cherry, $5,000; R. J. Anderson, 2 storey and attic brick dwelling, near Roncesvalles on north side Wright, $5,000; Wm. Tucker & Bro., 3 attached 2 storey brick dwellings south of C P.R. on east side Howland avenue, $7,500; W. L. Bullen, 2 storey brick apartments, near Bloor on east side Montrose, $8,000; G. W. Holmes, 2 storey and attic brick dwelling and office, on 430 Bloor west, $5,000; F. G. McBrien, 3 pair semi-detached 2 storey brick dwellings on west side Perth, $12,000; H. L. Kennedy, 2½ storey brick dwelling on 11 Edgar, $5,000; Major A. A. Mulholland, 2 storey brick dwelling, near Glen road on north side Edgar, $8,000; J. C. Eaton, 2 storey brick power house, near Spadina on Davenport, $5,800; The Baraca Club, 2 storey brick club rooms, near Spadina on north side Orchard, $11,500; Fisher Bros., 2 pair semi-detached 2 storey brick dwellings, southwest corner Perth and Wallace, $8,000; Geo. A. Briggs, 1 pair semi-detached 2-storey brick dwellings on south side Gormley, $4,000; John T. Colley, 2 detached 2½ storey brick dwellings on 812-814 Indian road, $5,000; W. A. King, 2 storey and attic brick dwelling on St. Clair Gardens, $6,500; A. J. Savage, 2½ storey brick dwelling on St. Andrew's Gardens south, $5,000; J. H. Maguire, 2 detached 2 storey brick dwellings on south side Humberside avenue, $4,000; Wm. Hodgkinson, 2 rows of 3 attached 2 storey rough cast dwellings, brick fronts, on east side Boston avenue, $10,000; G. Delamatter, 2 storey brick dwelling, near Brock on south side Neusham street, $4,000; Peter Laughton, 1 pair semi-detached 2 storey brick dwellings, on east side Uxbridge, $4,000; James Turner, 1 pair semi-detached 2 storey brick dwellings, on 123-5 Springhurst avenue, $7,000; W. F. McCutcheon, 1 pair semi-detached 2 storey brick dwellings, near Brock on north side Wyndham, $4,000; H. P. Baird, 1 pair semi-detached 2 storey brick dwellings, near Fern on east side Roncesvalles, $7,000; Jas. A. Stewart, 2½ storey brick dwelling near Heath on west side Dunvegan, $8,000; Jolly & Martin, 3 attached 2 storey brick dwellings near Royce on east side Emerson, $6,000; G. A. Howell, 2 storey and attic brick dwelling on Wychwood avenue, $6,800; Fred G. McBrien, 2 pair semi-detached 2 storey brick dwellings near Perth on south side Ruskin, $8,000; Harry J. Rea, 2½ storey brick dwelling near Roxborough on Glen road, $4,500; Board of Education, 3 storey brick school near Clendenan, on Annette, $60,000; J. G. & A. Churchill, 1 pair semi-detached 2 storey brick dwellings, near Shaw on south side Yarmouth, $4,000; M. Dale, 1 pair semi-detached 2 storey brick dwellings near Pape on Dresden, $4,000; W. C. Mathews, 2½ storey brick dwelling on 6 Chestnut Park road, $12,000; McGowan & Wells, 1 pair semi-detached 2½ storey brick dwelling on Crawford, near Harbord, $5,000; E. J. Crocker, 1 pair semi-detached 2 storey brick dwelling, near Queen on west side Booth, $4,000; W. Grogan, 1 pair semi-detached brick dwellings, on 23-5 Grafton avenue, $4,000.

Vancouver, B.C.

Recent building permits include: R. J. Baker, 1423 Eleventh avenue west, two houses, $4,800; J. Morley, 2415 Seventh avenue west, $2,000; James Mason, 3430 Third avenue west, $4,500; Prudential Builders, 1945 Fifteenth avenue west, $3,500; Prudential Builders, 1906 Fourteenth avenue west, $3,500; Prudential Builders, 1925 Fifteenth avenue west, $3,000; A. S. French Auto Company, 1027 Pender street, $55,000; A. McLellan, 1149 Lily street, $2,000; A. McLellan, 1563 Graveley street, $2,000; A. McLellan, 1569 Graveley street, $2,000; J. Morley, 2446 Eighth avenue west, $2,000.

Winnipeg, Man.

The following building permits were recently issued: C. Keele, house, north side Athol, $2,400; A. C. Keele, south side Lansdowne, $2,000; P. Olson, two houses, west side of Home, $5,000; R. Western, house east side Greenwood Place, $4,500; City of Winnipeg power development substation on King street, $40,000 (the engineer of construction has the contract; Sterling Bank of Canada, excavation and footings for bank, corner of Portage avenue and Smith street, $12,500; D. Belinkow, house, south side of Redwood, $2,700; C. McFayden, house, south side of Polson, $2,600; A. G. Davidson, house, west side of Craig street, $2,500; W. Tochack, house, north side of Cathedral, $4,000; W. M. Baker, house, southwest corner Dorchester and Stafford, $5,200; Elliott Brothers, house, south side of Aberdeen, $2,000; C. Metcalfe, house, east side of Victor, $2,800; N. Miller, house, west side of Home, $2,700; The Hudson's Bay Company, warehouse addition, west side of Main street, $9,300; Ratner Brothers, three house terrace, southeast corner of Pritchard and Salter, $7,000.

AWARDED.

Toronto, Ont.

The Board of Control awarded contracts as follows for fire hose: Dunlop double jacket, 1,000 feet, price $1.05 per foot, to the Dunlop Tire & Rubber Goods Company; Keystone double jacket, 1,000 feet, price $1.05 per foot, to the Canadian Rubber Company; Magnet multiple woven, 1,000 feet, price 95c. per foot, to the Durham Rubber Company; Special high pressure multiple woven, 3,000 feet, price $1.10 per foot, to the Gutta Percha & Rubber Manufacturing Company, Limited.

New Companies

The Cummings Brass, Iron & Wire Company, Limited, Winnipeg, Man., capital $50,000. Incorporators: Thos. Cummings, manufacturer; Wm. J. Cummings, manufacturer, and Wm. M. Sharpe, builder, all of Winnipeg.

The Marine Construction Company, Limited, Toronto, Ont., capital $40,000. Incorporators: Wm. P. Gillespie, broker; Jno. G. Robinson and Wm. Maybin, manufactuerrs, Toronto.

Cunningham Lumber Company, Limited, Toronto, Ont., capital $40,000. Incorporators: James P. Cunningham, lumberman; Jno. D. Bissett and Theodore H. Peine, barristers, all of Toronto.

The Rock Lake Lumber Company, Limited, Superior Junction, Ont., capital $100,000. Incorporators: Thos. N. Dunn, Strathroy, Ont., manufacturer; John Thomas, Inwood, Ont., banker.

The Bolton Light, Heat & Power Company, Limited, Bolton, Ont., capital $40,000. Incorporators: Jos. F. Warbrick, banker; Edwin A. Jaffray, merchant, all of Bolton village.

The Schwab Boiler Heating Company, Limited, Ottawa, Ont., capital $100,000. Incorporators: John Schwab, architect, Winnipeg, Man.; Alexander Campbell, mechanical engineer; Alfred E. Fripp and Thos. D. McGee, barristers, all of Ottawa.

Backway Pulp Timber Company, Limited, Toronto, Ont., capital $250,000. Incorporators: Duncan D. McLeod, and James Aitchison, students, both of Toronto.

Beams in "Genuine" Mill Construction

"Mill construction of the genuine kind," says F. W. Dean, of Boston, in a recent paper, "and that which the mutual insurance companies seek to encourage, and as far as possible the only kind that they will tolerate, contemplates the smallest possible number of large wood beams for floors and roof, all running in one direction, covered with thick plank. A floor system with bays so wide that beams running at right angles to the main transverse beams are required, is not mill construction and is not desirable. It is not desirable because it is complicated, the supplementary beams are likely to be supported by non-fire-resisting connections, and sprinkling is less effective and more difficult and expensive to install than with the genuine kind.

"Mill construction contemplates the use of wood beams instead of steel, because in case of fire the latter when heated lose their strength and the floors fall with great loss to building and machinery. In the case of wood beams the fire is usually put out by sprinklers and otherwise before the beams lose sufficient strength to produce this result.

"The beams of wood floors are of longleaf Southern pine or Northwestern pine, the latter being used only in the West, Northwest and Canada. The beams are usually planed on three sides and with the lower corners chamfered."

The Smart-Turner Machine Company, Limited, Hamilton, have received orders for the travelling crane, for the C. P. R. at Winnipeg, Man.; for supplying the Oliver Plow Company of Hamilton with the tumbling barrels, for their new works; for a vacuum pump from the Royal Crown Soap Company, Limited, Vancouver, B.C.; for a centrifugal pump for the Peoples' Railway, at Berlin, Ont.

Tenders and For Sale Department

Notice to Contractors

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, up to noon on TUESDAY, NOVEMBER 22ND, 1910, for One ten-ton, hand-operated travelling crane at the high level pumping station, and one fifteen-ton hand-operated travelling crane at the main pumping station.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained at the office of the City Engineer, Toronto.

The tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer), not members of the City Council or officers of the Corporation of the City of Toronto, or, in lieu of said sureties, the bond of a Guarantee Company, approved as aforesaid.

The usual conditions relating to tendering, as prescribed by city by-law, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman Board of Control.
City Hall, Toronto, Nov. 4th, 1910. 45

City of Winnipeg

Electrical Distribution System

Tenders for Wire and Cable, Poles and Line Supplies

Sealed tender, on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope, "Tenders for Overhead Wire and Cables," will be received at the office of the undersigned up to 11 a.m. on MONDAY, NOVEMBER 7th, 1910.

Sealed tender, on prescribed forms, addressed as above, and marked on the envelope, "Tender for Poles and Line Supplies," will be received at the office of the undersigned up to 11 a.m. on THURSDAY, DECEMBER 1ST, 1910.

Copy of specification and form of tender may be obtained at the office of Smith, Kerry and Chace, Carnegie Library Building, Winnipeg, Canada, or at the office of the firm in Toronto, Ontario.

Each tender must be accompanied by a certified cheque as set forth in the instructions to bidders, which cheque will become forfeit to the corporation under the conditions set forth in that document.

The city reserve the right to reject any or all tenders, or to accept any tender which shall appear advantageous to the city's interests.

M. PETERSON,
Secretary.
Office of the Board of Control,
Winnipeg, October 24th, 1910. 45

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

ACCOUNTANT, six years with large American construction company, wishes position. Thoroughly experienced in contractors' detailed cost records. Excellent references. Box 159, "Contract Record." 46

Equipment for Sale

One Georgian Bay Hoist Engine, double cylinder, reversible, link motion, 15 h.p., new and complete with 150 feet of ½-inch steel cable.

One Steel Side Dump Car, 2-foot gauge, capacity one cubic yard; 400 feet of 20-pound steel rails, new, with bolts and spikes.

One 25 h.p. Second-Hand Locomotive Type Boiler, in good condition.

One Hand Derrick, with castings for both ends of boom and legs, 90 feet of ¾-inch wire cable.

One Friction Horse-Power.

STINSON-REEB BUILDERS' SUPPLY CO.,
Limited.
Eastern Townships Bank Building,
46 Montreal, Que.

Carrying a Street on Concrete Brickets

Three years ago the Western Railway Company of France began to widen the gauntlet at the entrance to the Saint Lazare station, Paris. The work made it necessary to utilize the space under the Rue de Rome, a very busy street, and consequently it was decided to carry part of it on brackets for a length of 1,500 feet. The portion thus supported is 23 feet wide, of which 13 feet are taken up by the footpath, and 10 feet by the waggon way. The wall carrying the brackets rises to a maximum height of 63 feet. The following notes on the design and the reasons for its adoption are taken from the Engineering Supplement of the "Times," London:

"It was considered of importance to arrange the new tracks alongside the others in the open, on account of the numerous cross-overs that have to be constructed, and the probability that these, as well as the lay-out of the tracks themselves, will have to be modified from time to time in the future as they have been in the past. For the same reason it was desirable to keep the lines free from supporting columns, and hence it became necessary to adopt a system of projecting brackets in reinforced concrete. This solution of the problem was proposed by M. Charles Rabut, the chief engineer, who after rather long discussions secured its adoption. Apart from the reasons given above, M. Rabut urged that as the new tracks were intended for the Auteuil line, on which the trains run at intervals of three minutes, it was not advisable to place them in tunnel or in any location that would give rise to difficulties in ventilation. The authorities of the city of Paris on their side also welcomed this solution, which avoided the necessity for the railway to pass entirely under the public road and thus to interfere with the sewers.

"The reinforced concrete brackets which carry the road are spaced at 17-foot intervals. Each of them is supported by a member projecting from the wall and provided at its upper end with eight steel ties 3 inches in diameter. These are anchored in the base of the wall by means of a continuous longitudinal ferro-concrete beam, the purpose of which is to distribute along the wall the stresses exerted locally by the brackets. To counterbalance the thrust of the earth, so that it was unnecessary to thicken the lower part of the wall. Except for this widened portion at the top, which extends downward for a length of 8 feet, the thickenss is uniform, being 7½ feet, or one-eighth of the height.

"In consequence of the criticisms directed against the design M. Rabut subjected the structure to severe tests, taking careful measurements of the deflections. The load with which the pavement was tested was increased from 82 pounds per square foot required by the plans to 123 pounds, and the load on the roadway, which was to have been furnished by a 33-ton steam roller, was aggravated by making the roller bump over planks of wood one inch thick, which were nailed transversely to the wood pavement at certain distances apart. In spite of the formidable shocks caused by the fall of this enormous mass the total of the loads did not suffice to deflect the extremities of the brackets by more than 1 mm. Finally a motor omnibus driven at full speed over the supported portion of the road produced no measurable deflection, although this kind of vehicle gives rise to strong vibration in earth and buildings.

"M. Rabut does not consider that these brackets represent any bolder method of construction than a bridge, and the popular impression to the contrary, he thinks is due to the fact that the unsupported portion alone is visible, the counterbalance being hidden behind the supporting wall."

The B. C. Gazette gives notice of the incorporation of hte following companies. Poulin Lumber Company, Limited, capital $100,000.

It has been officially announced that the C.P.R. has decided to build four new steamers for a fast direct steamship service between Nova Scotia ports and Boston and New York. This is one of the important developments that will follow the absorption of the Dominion Atlantic into the system in the spring. The new vessels will be the type of ocean liners, about 450 feet in length, with a carrying capacity of 5,000 tons, and able to make over 20 knots.

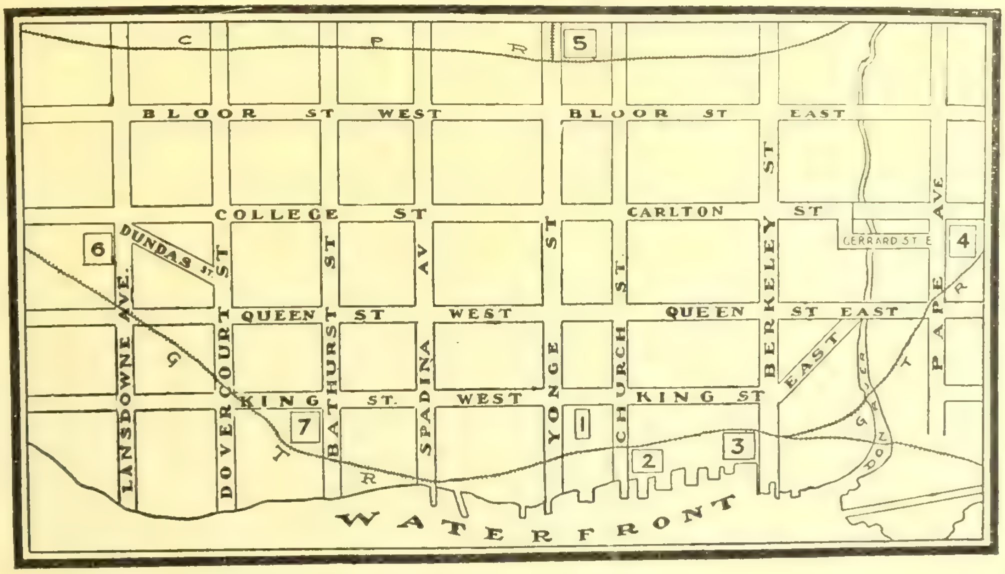
The Canadian Government are looking to the future in the extensive western park reservations they have made during recent years. According to figures supplies by Mr. Bysshe, of the accounting department of the interior, the Dominion now has a total of 11,000 square miles of parks. The biggest park is Jasper, in the Yellowhead west of Edmonton, which is now being opened, and which is 5,000 square miles in area. This park has hot springs that are finer than those at Banff, and the scenery in the park is said to be even more beautiful. Then there comes the Rocky Mountain park at Banff, with an area of 4,500 square miles. Yoho park in the Rockies has an area of 428 square miles, and Glacier park about 450 square miles. Wainwright Buffalo park has 162 square miles and Elk Island 16, with 54 square miles in Watertown lakes park. In addition to these parks, the Dominion controls 12 islands in the St. Lawrence river,

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

Telephone
Main
4
1
5
5

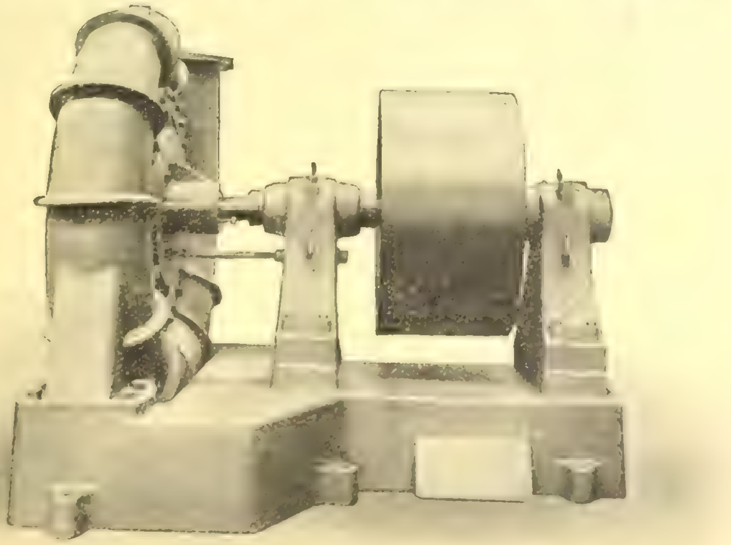
No's
2,
4,
5,
6



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WORTHINGTON VOLUTE PUMPS



We design and build the volute type of centrifugal pump here shown for

LOW HEADS
MODERATE SPEEDS
ANY CAPACITY

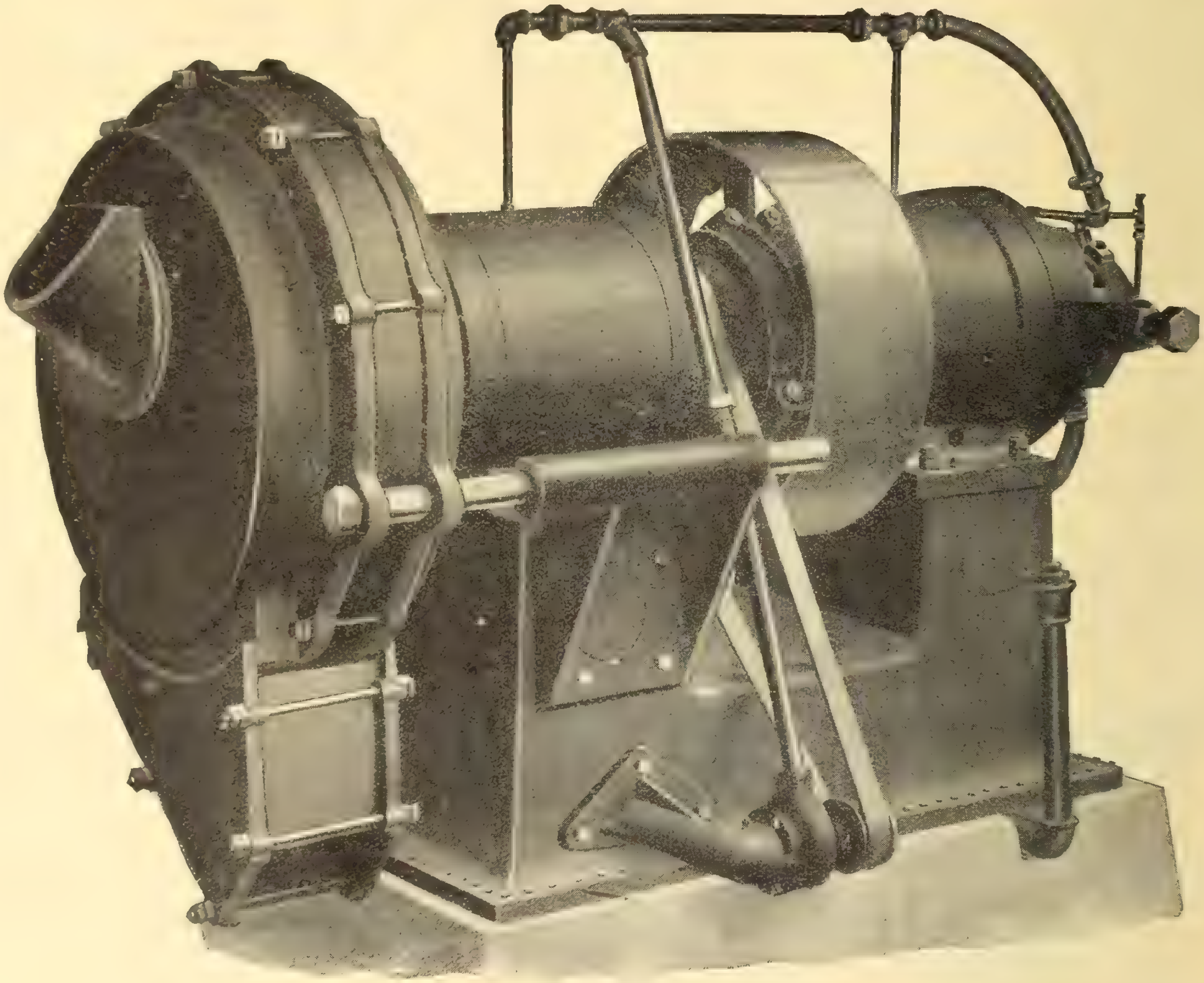
For full particulars see
Bulletin 104

WORKS:
512 William St., Montreal

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

A New Princ



Sy

Cr

Look

Takes large rejections or granite boulders and in one operation crushes down to any siz

The largest size takes 8 inch stone and makes any size down to 1-2 inch and less.

The medium size takes 4 inch stone and makes any size down to 1-4 inch and less.

The small size takes 2 inch stone and makes any size down to 1-8 inch and less.

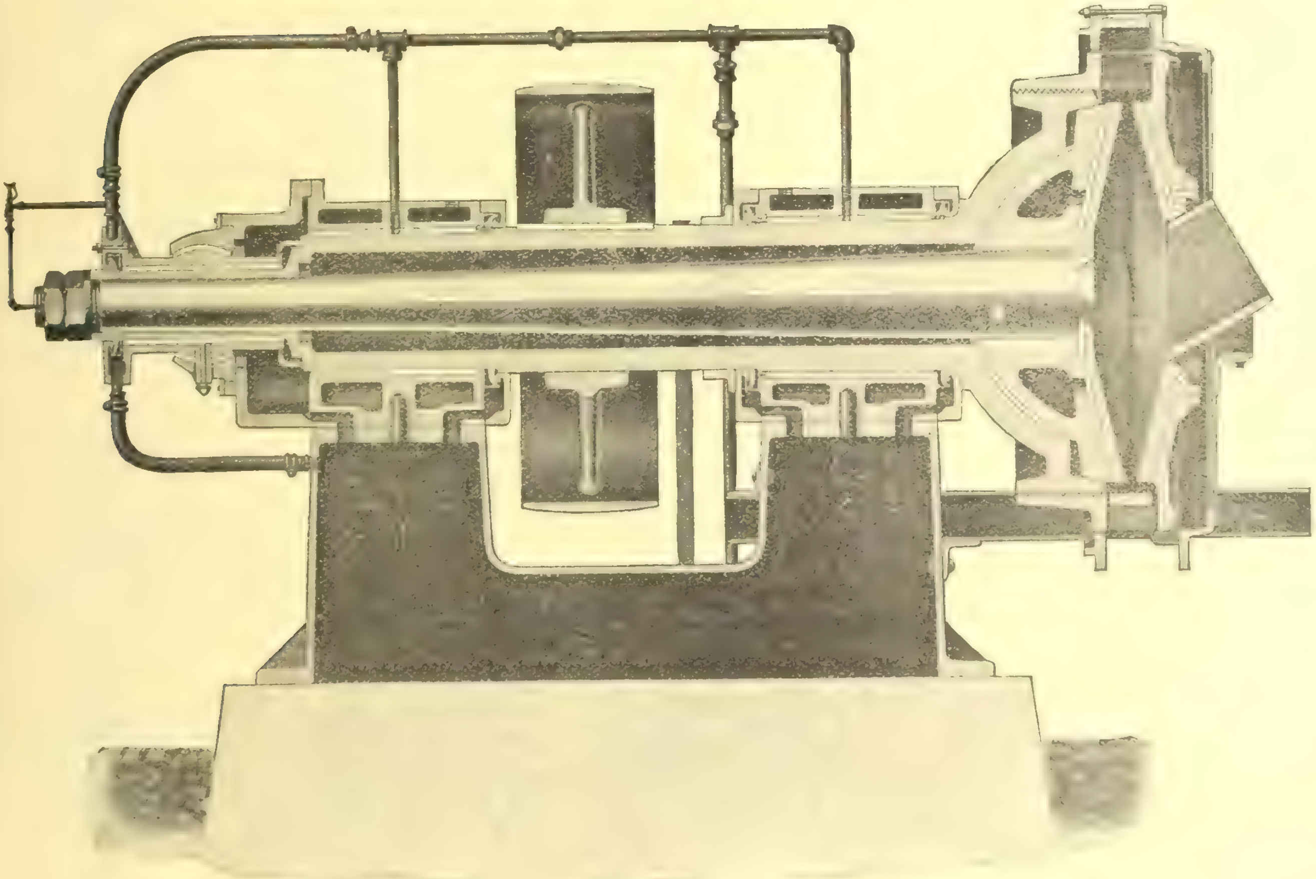
The Crusher has two Dish Shaped Manganese Steel Discs the hollow sides of which face e other. These discs rotate in the same direction at the same speed. The stone is fed

Head Offices and Warehouses :

Montreal

MUSSEN

e in Crushing



een them through a central feed opening and is caught between them where they are idest apart, and carried around with them to where they are closest together being crushl in going halfway round. The smaller particles fly out during the next half round and e larger pieces caught again. The crushing movement may be regulated while the usher is running.

Let us send you full information. Free on request.

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

GRABS

150 designs for 150 uses
Will lift 30% more material than the next best design on the market

FOR Collieries, Mines and Railways

Cranes, Hoists, Lifts

WIRE ROPE

Flattened Strand
Flattened Concentric Strand
Locked Coil
Guide and Crane
Langs and ordinary lay

Transmission of Power

Suspension Bridges, Aerial Tramways

CHAIN

All grades for all purposes

Concrete Mixers
Ore and Rock Crushers

Electrical Machinery

Write us for prices, particulars, etc.

CANADA FORD COMPANY — Montreal

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
J. R. HOOPER, Representative.
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto November 9, 1910 No. 45

Victoria, B. C., in the Limelight

The writer who complained in a recent issue of this journal, that during recent years certain specifications had been revised and devised "apparently with the object of putting all contractors out of business," may find some consolation in a perusal of the conditions "devised" by the city of Victoria, B. C., for repairing the Smith's Hill reservoir.

Parenthetically, it is of interest to recall in this connection that Arthur L. Adams, the water expert of California, under whose supervision the reservoir was constructed in the first instance, gave it as his opinion, subsequently, that the necessary repairs could be effected for $30,000. This sum was included in the estimates at the beginning of the year. Later, Mr. G. H Bryson, acting city engineer, made a survey of the reservoir and reported that in his opinion the reservoir could be made watertight for $15,000. Later again, Mr. Angus Smith, city engineer, gave the council an estimate of $6,000. And a few weeks ago the Pacific Coast Construction Company made a bid of $3,000. Somewhat enlightened by these circumstances the civic authorities decided that it would be interesting to call for tenders. The basis upon which these have been invited has been aptly termed "no cure, no pay."

The conditions to which we refer are as follows

(a) The tenderer shall submit his own specifications.

(b) The successful tenderer shall give a guarantee bond, covering a period of five years from date of completion of the contract; that the work done by him under the contract shall effectually prevent any further leakage, even when the reservoir is filled with water to its full capacity; and that if any leakage shall occur during the guarantee period he will repair the breach forthwith and make the reservoir watertight at his own expense.

(c) A sum equal to 25 pe cent. of the contract will be paid to the contractor at the end of the guarantee period, providing the reservoir will then hold water at its full capacity without leaking.

(d) If, at the expiry of the guarantee period, the reservoir should not hold water when filled to its utmost capacity, without leaking, the said sum of 25 per cent. shall be forfeited to the corporation. The lowest or any tender not necessarily accepted.

Having in mind the facts set forth in our parenthesis, it is reasonable to suppose that the city council of Victoria expect to be inundated with offers for the work. Possibly they may think that some enterprising concern will came along and do the job at a nominal figure—for the glory of it! Certainly it would be an advertisement that could be obtained in no other way. But what kind of an advertisement? The question resolves itself into this; are there *any* contractors in or around Victoria, B. C., willing to submit to the imposition of conditions which require them not only to put up a guarantee bond, but also to leave 25 *per cent* of the total contract price in the hands of the city for a period of *five years*; and further, to make good any defects that may occur during that time. We hope not. Contractors who are alive to their own interests will give a wide berth to such conditions as these. After all, the issue is at their disposal. If they figure under such terms and get the job they encourage imposition and weaken their own cause. If they hold aloof, the work will be carried out by the city engineer. And certainly he should be welcome to it.

Inspection of Contract Work

The engineer's position as sole arbitrator on construction work has been discussed in recent issues of this journal. (See issues of Sept. 28, p 35, and Oct. 19, p. 38). In a discussion the other day anent the subject of inspection, which has some bearing, one speaker, himself an engineer, got at the root of the whole matter by saying that contractors or their working representatives are, as a rule, older and much more experienced in dealing with others than the best of inspectors. If embryo engineers are to be given these positions, they must not be clothed with final and arbitrary authority. Continuing he said:

"If an inspector, incapable by lack of experience and maturity of judgment, is given authority and placed in a position to bind or hamper the decisions of the referee named in the contract, the result may be unfortunate or disastrous. Unscrupulous contractors undoubtedly exist who do not fail to take advantage of such a situation. It is to be regretted that so many contractors seem to regard the obligations placed on them by their contracts as not mandatory and not matters to be lived up to in spirit because of the agreement that they shall be fully carried out. Many contractors, on the contrary, seem to regard the specifications under which they agree to do work as merely statements of the things which the owner or referee will try to accomplish; that it is the duty of the referee to enforce them if he can; and the privilege of the contractor to evade as many of them and as far as he wishes. To place a young, perhaps inexperienced, party in a position to decide the many points that may be raised by an experienced superintendent or foreman is almost sure to prevent the owner, who pays for the work done according to the specifications, from getting what he pays for, to which he is entitled, and which the moral obligation on the contractor alone should compel the latter to deliver. I can recall numerous instances where, as the inspector's authority was not clearly limited in the contract, the contractor claimed that the referee and owner were stopped from finally securing the kind of work the owner was clearly entitled to and the contractor had agreed to give him, and had named his price for giving him, because the inspector had accepted the inferior work or had failed to condemn it.

"It is far fairer and better in every way, including all considerations of justice to the contractor and to other bidders, to provide that an inspector shall simply report the facts, and that the decisions shall be left to the owner or the experienced referee specified. Some greater delay may occur in securing final decisions under the latter method, but the decisions will undoubtedly be more just on the average, and except in those cases where questions are raised for the purpose of evasion or for making difficulty, when delay in the decision may be justified, they will be more in accord with the spirit of the contract."

Use and Abuse of Engineers' Cost Data

Sound Judgment and Experience Needed in Taking Records as a Basis for Estimating or Criticism Careful Analysis Essential

There has been a great interest aroused throughout the engineering profession in recent years over the collection and publication of so-called "cost data." The term is a convenient one, signifying the records of the cost of carrying out various classes of engineering work, such records being preferably given in prices per unit of completed work. In all well-conducted manufacturing establishments it is now considered indispensable to keep regular records of the cost of the labor and materials entering into any product. Such cost keeping in factories, properly carried on and properly used, has been the means of effecting enormous savings. It has furnished a guide through which the productive efficiency of many shops and factories has been revolutionized. We would say no word here to lessen the general appreciation of such cost accounting.

Now, just as the old-time factory knew little or nothing of cost keeping, so the old-time civil engineer knew little or nothing of cost data, at least in the shape of systematic records, and certainly nothing in the way of published records available for reference. In fact, the civil engineer of 50 years ago had little need for such data. He was comparatively little concerned with question of cost. It was conceived to be his business to make his work strong and substantial. It was for the executive heads over him and the contractors who worked under him to deal with questions of the cost of work.

Old-time Idea Still Prevalent.

We find remnants of this old idea persisting even to-day. There are still to be found some among the older members of the profession who contend that the engineer should not concern himself with costs and economies except, of course, to the extent that they affect the larger problems that he has to solve. This does not apply, however, by any means to the rank and file of the profession. It is well understood to-day that an engineer is expected to know the commercial side of his profession; to know how to construct not only safely but economically. He should be able to estimate in advance what the cost of given work will be, and his professional reputation will be very largely gaged by the accuracy with which he makes such estimates.

Now, all these matters of the cost of work cannot be evolved from a man's inner consciousness. They are problems which no mathematical formula can solve. They are matters of experience; and as no man's experience is broad enough to cover more than a limited range, we find engineers in all branches of the profession placing high value on published records of cost.

This demand of the profession is reflected in its literature. Within the past ten years, however, cost records in engineering literature have multiplied apace. A description of an engineering work is not considered complete to-day unless it gives something, at least, relating to the cost of the work with which it deals.

The things we have set forth above are, we assume, pretty well known to the engineering profession. It would not probably have been worth taking space to set them down here, except that what we have to say below should not be misunderstood. We have referred in our heading to the use and *abuse* of cost data. It is because the existing information on costs is susceptible of misuse that some words of warning appear to be needed at the present time. If all the published data on engineering costs were full and complete and reliable, an engineer could make use of them with perfect confidence in his results; but we have the best of reasons for declaring that this is far from being the case. A small proportion of published costs records are complete, in that they give all the essential facts regarding the conditions under which the work was carried on. They are presented in such a way that the careful reader will not misinterpret them, and they are full enough to enable the figures to be used with confidence.

A much larger proportion of published cost data, however, are lacking in some or all of these particulars. The information is by no means without value, but it needs to be used with great caution. The engineer must use it, as he uses many other tools, because he has nothing better to work with; but if he is a wise engineer he will be very careful lest he do himself an injury in handling what may prove a two-edged sword.

"Pocketbook Engineers."

If nobody made use of cost data but competent engineers, possessed of that good judgment which is the most valuable characteristic of the competent engineer, there would be no need of sounding a caution concerning the abuse of cost data. These records of cost, however, are spread abroad in published journals and are open to anyone to use. Every engineer of standing and experience is well aware of the existence of so-called "pocketbook engineers"—men who add to a possible smattering of college training the information they have collected from published pocketbooks, and who, on the strength of such an equipment, but sadly lacking experience and good judgment, set out to do engineering work on their own hook. The misuse of cost data by such men often results most seriously for themselves and their clients.

We do not mean by this to undervalue in any respect the importance of published information, whether in pocketbooks, in more ample engineering treatises or elsewhere What we do wish to emphasize is the fact that some breadth of information and sound judgment are absolute pre-requisites to successful work as an independent engineer; and if a man lacks these he is likely to bring serious discredit on himself and on the profession in attempting to carry out engineering work.

Cost records are extremely useful to the designing engineer; to the estimating engineer; to the contractor in making plans and estimates and following the work that he has in hand; to the superintendent engineer in following through a piece of construction. But when such records are made the basis of published criticisms of engineers or contractors, it is time to call a halt. We do not say that such criticisms may not be justified. We do say that the basis on which such criticisms are made is wholly insufficient to warrant any one in forming a judgment.

We do not undervalue either the possibilities which comparative cost figures may offer in the way of critical analysis. It is posisble, for example, that some day we shall have municipal accounting on so uniform a basis that it will be possible to usefully compare the cost of street cleaning in one city with that in another, or the cost of pumping water in one city with that in another, and so on and all through the line of municipal housekeeping.

At the present time, however, the differences in methods of bookkeeping and accounting, and the differences in conditions, are such that without a most painstaking and thorough comparison and analysis of all these differences, no one is justified in making use of comparative cost data, without other supporting information, to hold any engineer or contractor up to public criticism.—*Engineering News.*

Finishing a Concrete Building Wall by Brushing

A brushed finish was required in constructing the concrete walls of the Tuberculosis Hospital at Rockville, Ind. The contractors, Brubaker & Stern, give the following data regarding the work in a paper before the Indiana Society of Engineers:

No special material was used to secure this effect. Precaution was taken, however, to make the mixture as uniform as possible, and the forms were well spaded to bring the pebbles next to the forms. The foundations of the various buildings ranged from 5 to 6 feet in height. The forms of the face were taken down when the concrete was 24 hours old, and the entire surface, thus exposed, was brushed immediately before the cement set hard. They used plain water for most of the work, and only a few times did they have to resort to acid. After the men were broken in they became quite expert, and they had no trouble in getting a good effect.

The contractor informed us that the work cost him approximately 2 cents per square foot in addition to the cost of the concrete wall; that is, the extra cost, in obtaining the brushed surface, was 2 cents per square foot. The specifications for the work follow:

Forms.—Forms are to be built in sections and so arranged that each section can be taken down at the proper time, to give access to the face of the concrete. Molds are to be nailed onto the face of the forms to carry out the design as called for in the details. Lintels over doors and windows are to be run separately, and the forms are to be built accordingly.

The proportions are to be as specified above. The gravel must be screened and the mixture must be absolutely uniform to get the proper effect. Concrete is to be dumped into the forms in layers and kept level. An entire section of the forms must be run at one time, and the forms must be well spaded to bring a uniform mixture to the face of the walls.

Forms are to be taken down in 24 hours, during warm, dry weather; otherwise, to remain as much longer as conditions require. The surface is then to be brushed with wire brushes and water till all of the cement has been washed off, leaving the pebbles or stones exposed and in good relief. If necessary, a small amount of muriatic acid should be added to the water. The best brushes for this purpose are a fine brush, No. 177, and a coarse brush, No. 1082. Care must be taken that the pebbles are not dislodged If the concrete is too soft to permit brushing, the work must be delayed a sufficient length of time. The returns to the window and door jams must be treated in the same manner.

Caisson Sinking in Record Time

The inking of the foundations for the mammoth municipal building which is in process of construction, opposite the Manhattan entrance of the Brooklyn Bridge, has involved a number of interesting engineering problems and at the same time has afforded opportunity for the contractors to establish a new record in the sinking of caissons. In the course of the work a caisson for one of the column piers was sunk through sand to bed rock at a depth of 112 feet 1 inch below water level, without accident or casualty of any kind. The caisson was of concrete, with a reinforced cutting edge and supporting a concrete shaft 10 feet 9 inches in diameter, which was cast before sinking. The construction of the caisson was commenced April 15, and the bottom was passed May 16. While under the maximum air pressure of 47 lbs., the work was executed by 20 five-men shifts working about 40 minutes each, with a very long time for decompression and an interval of 4 hours between the two shifts each man worked daily. The men were under very strict physical and medical supervision, improved sanitary and hospital appliances were on hand and a competent physician was in constant attendance, and not even a single case of the bends occurred. This is believed to be the deepest pneumatic caisson ever sunk, and is expected to be the maximum for the building, which will have 106 caissons, over half of which have been sunk. The Foundation Company, of New York City, who have secured a number of important contracts in Canada recently, have the contract for the substructure.

The new Transportation Building at the corner of St. James and St. Francois Xavier streets, Montreal (Messrs. Carrère & Hastings and Ross & MacFarlane associate architects), will be constructed of Marmo Semi-glazed Terra Cotta. This contract, which is stated to be the largest terra cotta contract ever placed in Canada, has been awarded to Eadie-Douglas, Limited, 12 University street, Montreal.

The Sewage Disposal System of Toronto

Notes on Design and Construction—Recommendations of Messrs. Watson and Hering, the Consulting Engineers—An Economical and Satisfactory Solution

By C. H. Rust, City Engineer.

Toronto, up to the present time, has poured its sewage into the bay, and, whilst the question of disposing of sewage at one central point has been before the city council for many years, and a number of reports have been made by different engineers, all of which reports advocated the disposal of the crude sewage into Lake Ontario, at points varying from four to nine miles east of the water works intake pipe, it was not until 1908 that the sum of $2,400,000 was voted to proceed with the construction of those works, and it was decided, in view of plans being adopted to filter the water, that the sewage could be safely deposited into Lake Ontario at a distance of about four and three-quarter miles east of the intake pipe.

There are two interceptors. Beginning at the screen house near the sewage tanks, the high level interceptor will extend westerly for a distance of eight miles. The sewer is circular in form throughout. Its maximum size is 9 feet 6 inches in diameter, and the size gradually decreases to a minimum diameter of 3 feet 6 inches. This sewer will collect practically all the sanitary or dry weather flow of sewage which can be carried to the disposal works by gravity.

The low level interceptor, commencing also at the screen house and pumping station, extends for a distance westerly of five and a half miles and varies in size from a diameter of 5 feet 6 inches to an egg-shaped sewer 2 feet 9 inches x 4 feet 3 inches.

The rate of fall of these sewers is such as to give us a minimum velocity of wall over two feet per second under present conditions, with a maximum velocity in the neighborhood of four feet per second.

The sewage carried to the disposal works by low level interceptor is required to be pumped a height of about twenty feet.

The disposal works, which are situated in the east end of the city, a few feet above lake level, are intended to furnish for the sewage a partial treatment consisting of screening and sedimentation. A large building is to be erected west of the sewage tanks containing the screens for both high and low interceptors, four centrifugal pumps, electrically driven (having a combined capacity of nearly 100 cubic feet per second), an auxiliary gas engine, generator, etc., and a sludge well, through which is drawn all the sludge from the sedimentation tanks. The sludge is pumped from this well by means of two 6-inch centrifugal pumps and carried through pipes to points on the neighboring marsh, which will be enclosed for the purpose. It is intended that the sand pump will work in conjunction with the pumping of the sludge in order to obviate any nuisance. The screens are to be of one-half inch bars, having one half inch spaces between each and will be cleaned by a mechanical device operated by electrical power. Three bucket conveyors will be placed in front of the screens to remove such material which gathers in front of the screens and which cannot be removed by the rakes. This building will be equipped with two cranes, one in the screen chamber and the other in the pump chamber, for the purpose of handling the machinery, etc.

The sewage from the low level sewer, after passing through the screens is pumped into a channel, which thus conveys the high level and low level sewage to the tanks.

The sewage tanks are somewhat after the design of the "Dortmund" tank, modified to suit the conditions of this city, and were designed by Mr. John D. Watson, of Birmingham, England, one of the consulting engineers. The tanks are constructed of concrete—reinforced where necessary—and are each 100-feet long and 25 feet wide. The four upper side walls of the tanks are vertical, but for the lower twelve feet the four sides converge on 45 degree slopes. The bottom of each tank is divided into

Bottom of tanks at various preliminary stages of construction.

Bottom of tank concreted, showing sludge drain connection.

four hopper-shaped compartments by means of slopes placed at an angle of 20 degrees from the horizontal, which is opened and closed by a stem reaching above the roof of the tank. This valve is connected to the cast iron pipe, which is the outlet for the sludge from the bottom of the tanks.

The sewage from the screen house is distributed among the tanks by the main inlet channel and its branches.

The present scheme embraces the construction of twenty-four tanks. These tanks are placed under one roof, having two lying end to end in one direction and twelve tanks side by side in the other.

Inlet and outlet branches of the main inlet and collecting channels are placed alternately between the sets of tanks. At the side opposite to that on which the main inlet channel is placed in the main collecting channel This conducts the tank effluent to the outlet chamber from which it is discharged into the effluent carrier. The height of liquid in the tanks is controlled by movable weirs between tanks and collecting channel.

The effluent carrier is a 60-inch circular pipe, of which about 1,800 feet is to be constructed in reinforced concrete, and the balance of 3,100 feet is a steel pipe. The total length being about one mile.

The concrete pipe whilst somewhat cheaper in first cost is not nearly as satisfactory to lay as the steel pipe. It is constructed in 24 foot lengths, each section weighing 16½ tons. Cast metal flanges drilled for bolts are supplied at the ends, forming a part of the pipe. The pipe is lowered in place and bolted together by divers.

The steel pipe which is much more satisfactory to put in position, and is absolutely free from danger of fracture is built in 50-foot lengths. The contractor is laying two sections at a time, bolted together.

For the purpose of giving alignment, platforms were built on piles in the lake at each change of grade. For the control of the flow of the sewage at the disposal works, stop gates and penstocks are arranged in such a manner as to permit shutting off any tank or series of tanks, or the sewage could be discharged direct into the effluent carrier and the tanks emptied into the sludge well. A storm overflow into the bay is also provided at the entrance to the tanks.

At the time of writing the sewage disposal works and high level interceptor are about one-third completed and work is being commenced on the low level interceptor.

It is expected that a portion of the system will be in operation next summer.

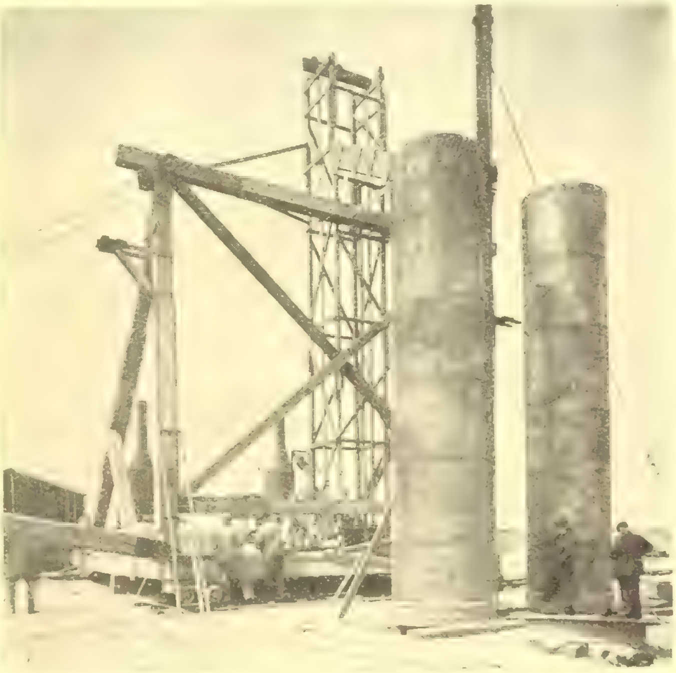
Mr. John D. Watson, chief engineer of the Birmingham Drainage Board, England, and Mr. Rudolph Hering, of New York, consulting engineer, were consulted with regard to the general schemes of sewage disposal in February, 1909, and the following are the conclusions they arrived at:

"After carefully considering the problem, which you have put before us, we believe that we can best present our report in the form of answers to the questions contained in the appended letter, addressed to us by Mr. C H. Rust, and to follow same with our general recommendations.

Question 1.—"In your opinion, would any fouling of the shore in the neighborhood of the outfall works occur?"

"With the design presented to us and with such modifications as are suggested hereafter, it is our opinion that the sewage of Toronto could be disposed of satisfactorily, not only without fouling the shore at any point, but in a manner that will be unnoticeable on the lake itself."

Question 2.—"Would it be possible, after careful screening of the sewage and making the provision for tank treatment, to use the resulting sludge with safety for filling purposes? If not, what method would you suggest for its disposal?"



Bottom of concrete pipes, showing inside forms and reinforcement.

"We hold the opinion that the plans of the tanks proposed by the City Engineer should be modified so as to ensure greater efficiency in the elimination of solids. Septic action is bound to take place in the sewage before it reaches the tanks, and to that extent the proposed tanks will contain septicised sewage. But we suggest a provision for cleansing each pocket of the tank daily by utilizing electric current to pump the solids to the west end of the Ashbridge's Marsh.

"If this course is followed, the sludge will not be exposed to the atmosphere until it reaches the western end of Ashbridge's bay, where it will be mixed with the dry refuse and spoil which is being deposited there to fill up the marsh. This can be done, not only with safety, but with advantage, as in our experience city refuse is generally combustible, and when ignited on rubbish heaps frequently gives rise to nuisance. Admixture with wet sludge will obviate this, and if the admixture is not deposited in layers exceeding two feet in thickness at one time, nitrifying bacteria will very speedily reduce the whole to an inoffensive substance.

"We are of opinion that if ordinary care is exercised no offensive odor will be perceptible more than a short distance from the site of the deposition."

Question 3.—"Provided proper ventilation is used with covered tanks, would there be any nuisance from odors?"

"Even without special ventilation no nuisance will arise from the tanks, if they are properly constructed and operated, but, as an extra safeguard, provision will be made to ventilate them by means of an electrically driven fan fitted with a suitable exhaust pipe."

Question 4.—"Would those residents in the immediate neighborhood of the works, or persons using Queen street as a highway, experience any nuisance from odors from the existence of tanks upon the site proposed?"

60-inch reinforced concrete pipe for outfall.

"Residents in the neighborhood of the tanks will experience no odor from them, and if the tanks are covered with earth and planted with shrubs and flowers, the site would even be rendered pleasantly attractive.

"If the sludge were removed from the tanks and deposited in proximity to them in th eordinary way, we think residents might have occasion to complain; but by making the only outlet for sludge at Ashbridges Bay opposite Cherry street, this possibility is entirely obviated. The tank will not be more noticeable to a person passing it than would be a flush tank or chamber in a large sewer under a leading thoroughfare.

In view of the results of additional trial holes, which we have had made, we advise that the tanks be located close to the shore line, south of Eastern avenue, where we consider that there is sufficient area of suitable land for their construction.

"We recognize the validity of the objections to having the tanks placed on a site that would entail an alteration of the line of a thoroughfare from the centre of the city to a beautiful undulating district.

"The position of the outfall sewer meets with our entire approval, but we think the sewer should be extended at least another 1,500 feet further into the lake, so as to insure a discharge into deeper water."

Question 5.—"Having regard for the large body of water into which the effluent is to be discharged, do you think that the proposed method of disposal could be operated successfully and satisfactorily?"

"Sewage is finally purified by oxidation, whether this be on land or in water; on land, by percolation through beds of sand, or beds of stone; and in water by oxidation accomplished by dissolved oxygen.

"We are of the opinion that the large body of water into which the effluent is to be discharged will successfully and satisfactorialy dilute and dispose of the sewage effluent.

"It is imperative that no visible particles of suspended matter should be allowed to reach the lake. The effluent, therefore, will consist of a liquid, the polluting matter in which will be mosty in solution, and when issuing at the outfall will be discharged in about 30 feet of water, and at least 3,500 feet from the lake shore.

"We recommend that the sewage be made to issue from a number of small openings in the outfall sewer, extending over a length of several hundred feet, so that, instead of discharging the effluent at one point, it will be discharged through many openings to facilitate a high degree of dispersion and dilution.

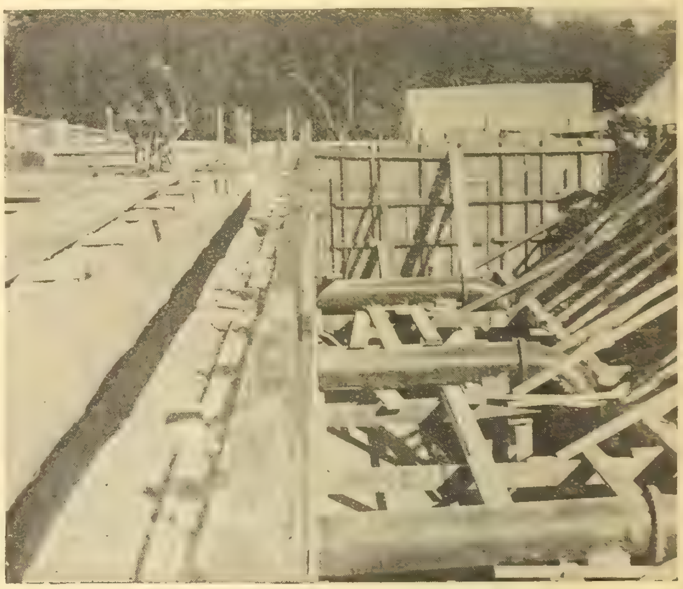
"We are entirely satisfied that the proposed location of the outfall will not injuriously affect the water supply, which fact will again be referred to below."

Question 6.—"In your opinion, do you advise the use of brick or concrete for the proposed intercepting sewers?"

"We recommend the council to construct the intercepting sewers of Portland cement concrete, having the invert lined with a single course of hard, sharp-edged, vitrified brick. This method of construction will be equally durable and less costly than a sewer built entirely of brick."

Question 7.—"In your opinion, is the proposed adoption of water filtration advisable and necessary, and will it completely safeguard the water supply of the city of Toronto in connection with the proposed sewage disposal works?"

"It is our opinion that the proposed adoption of water filtration is both advisable and necessary, and that it will completely safeguard the water supply of your city, not only with reference to any possible pollution from the proposed sewage disposal works, but also from any pollution in the neighborhood of the intake, due to excursion boats or other shipping. It will also prevent the water, made roily by the stirring up of the lake shore bottom by wave action during high winds, from reaching the city mains in a turbid condition.



Inlet channel and pipes, and forms for sidewalls.

Question 8.—"It has been considered by a great many of the residents of the east end that the disposal works should be situated upon the marsh in the vicinity of Cherry street. Will you please advise upon this matter, and if this site is selected, would you advocate the discharge of the sewage into the lake in its immediate vicinity, or should it be carried eastwardly to the point of discharge, as mentioned in the site already selected?"

"We have carefully considered the whole question of site, and have deliberately come to the conclusion that the Morley avenue site is the best.

"To construct the tanks at Cherry street would not offer any advantages in the treatment of the sewage over the plan above referred to, and in view of the sludge disposal at the Cherry street end of Ashbridge's bay, no advantages, from a hygienic point of view, would be obtained. Moreover, constructing the tanks at Cherry street would involve a much greater cost than constructing them at Morley avenue.

"Under any circumstances the outfall sewer should be located in the position shown on the plans, namely, about three thousand five hundred feet south of the shore opposite the Woodbine and upwards of four and a half miles from the water works intake.

After ten years consideration of the subject, the Royal Commission of Sewage Disposal came to the conclusion that the conditions of different cases vary to such an extent that each case should be considered on its own merits. In dealing, therefore, with the problem which you have placed before us, we have endeavored to give due weight to local circumstances. We are perfectly satisfied that the plans of the work as proposed, amended as we have suggested, will not only effectually dispose of the sewage of your city, but do it without danger to health, without nuisance at any point and for a reasonable outlay of money, therefore, we recommend their adoption."

Contracts for this work were awarded as follows: Sewage tanks, F. H. Dickenson, Hamilton, Ont.; laying outfall sewer from tanks to lake, Miller, Cumming & Robertson, Toronto; steel pipe for outfall, Canada Foundry Company; construction of reinforced concrete pipe, E. W. Hyde, Toronto.

The Present Utility of the Septic Tank

Concerning Certain Fallacies Entertained long after the Initial Experiments at Exeter—The Limitations of the Septic Tank and its Value

By Professor H. N. Ogden, Cornell University

In 1896, Mr. Donald Cameron, City Engineer of Exeter, England, with two others, was granted patent rights in an apparatus or invention for the purpose of dealing with crude sewage bacteriologically and bringing it into such a condition of solution and liquefaction that it could be thereafter more easily treated by filtration or irrigation or any other suitable way. Before that time, tanks of various kinds had been in use not only in England, but in other countries. For twenty-five years previously, chemical treatment had been the prominent method of eliminating from sewage the suspended matters which had been found to be troublesome, both on irrigation fields and in rivers and tidal estuaries. The bane of every superintendent in charge of a sewage disposal plant has always been the vast accumulation of sludge which is generally produced faster than the land available can take care of it, and which does not readily lend itself to any other method of disposal. There was no great difficulty in purifying the liquid part of sewage sufficiently so that it could be discharged into streams after the solids were removed, but to dispose of the solids —that was the trouble.

The value of Mr. Cameron's invention, the feature of his scheme which appealed to the city officials generally, was contained in this statement. "By this invention it is possible to get rid of the sludge difficulty because the sludge portion of crude sewage is entirely thrown into solution." His claim was based on experiments made in Exeter on a small tank twelve feet wide, fifteen feet long and two and a half feet deep, and was expressed as above after seven months operation. Since that time, much has been learned about the operation of sewage tanks, generally dignified by the name of septic, and the recent lawsuits over the patent rights involved as well as the papers before learned societies have produced evidence and discussion covering, not merely every detail of construction and operation of the tank, but even its very name. Engineers have considered the length of time during which sewage should remain in septic tanks and many experiments have been made in order to arrive at some definite conclusion. There has also been a large amount of testimony presented from various parts of the world on the action taking place during the passage of sewage through the tank. That gases of various kinds were developed by this action was easily discovered and one of the advantages at first claimed for this treatment was that the production of those gases would be a source of revenue to the municipality, replacing, to a large extent, the ordinary illuminating gas.

During the fifteen years since the patent was issued, many of the claims which originally were made for the invention have been disproved and more extended and scientific experiments on septic action have been made. Further than this, experiments and experience both have combined to establish certain definite appreciations regarding its value and it may be not out of place here to summarize, briefly, just what a septic tank may be expected to do and just what we know it will not do.

Wherein the Septic Tank Fails.

In the first place, we know definitely that it will neither purify sewage completely nor act as a panacea in eliminating sludge. Not long ago, the writer was much interested in the enthusiasm of a western salesman who was dealing in plumbing specialties. He had found that, in order to secure sales, he must be prepared to advise customers on the subject of sewage disposal and he was spreading broadcast recommendations, vouched for by himself as facts, to the effect that the installation of septic tanks would transform sewage of any degree of pollution into what, if not drinking water, might be considered equal to the quality of the average river. This is not true and no one who has followed the experiments on tanks believes it to be true.

Nor does the septic tank do what Mr. Cameron thought it did, namely, eliminate the sludge difficulty. Inasmuch as the septic tank is after all a tank, there is inevitably brought about a certain sedimentation so that the liquid passing out of the tank is usually freed from a certain amount of suspended matter. To this extent the sewage is purified and if filtration follows, the surface of the filter and possibly the interior of the filter is relieved of the usual clogging.

It was at first thought that the liquid carrying material in solution was itself affected by septic action and that certain [illegible] changes taking place in the liquid were desirable as being necessarily preliminary to later filtration. The English chemists and biologists have been inclined to cling to this idea and to divide all bacterial processes of purification into two, [illegible] one occurring in the septic tank where liquefying and anaerobic bacteria should transform the crude organic substances into ammonias and nitrites, the other the aerobic filter bed where these organic matters already started on the road to purification might be fully nitrified. The Massachusetts State Board of Health pointed out ten years ago that this theory was not always tenable since in their experiments it happened very often that no better results were obtained on filters dealing with septic sewage than filters dealing with crude sewage. Further than this, it was pointed out by them that if the action in the septic tank proceeded too far, subsequent filtration was thereby more difficult and less complete and this belief has extended until to-day the original claim of Cameron has been almost forgotten and the fact that so far as the liquid portion of the sewage is concerned septic treatment is immaterial if not objectionable has been fully substantiated.

Its Value as a Sedimentation Tank.

What, then, does the septic tank accomplish? Simply this. It manages to exert an action upon the material which is settled out of the sewage as it passes through the tank, not to the extent of destroying it all, as Cameron claimed, but to the extent of liquefying or gasifying about one-third of those solids. It was, and still is by some, believed that a septic tank never requires to be cleaned out; that in some mysterious way the bacteria destroy all the precipitating solids. This is far from being a fact, since no bacteria can act on mineral matter of which some is always present in sewage; nor can they destroy the humus-like material into which the organic material is converted. There is inevitably in a septic tank an accumulation of solids proportionate in volume to the flow of the sewage, provided such solids are retained in the tank. One can be very sure that where such an accumulation does not take place the solids are being carried out of the tank by the flow of the sewage and are being deposited in a finely divided state of the surface of the filter beds where they do more harm than if they had been carried out in their grosser and coarser condition.

The septic tank, then, is valuable in that it acts as a sedimentation tank, incidentally equalizing the flow of sewage and in that it may eliminate about one-third of the precipitated solids. Unfortunately, if the flow of sewage through the tank is so slow as to permit the destructive action to reach its maximum effect, there has been found a resulting action in the liquid of the sewage which poisons it so that subsequent treatment of the sewage is made more difficult. The odors of the plant are always increased also if the septic action is pronounced. Therefore the designer of the tank is almost at a loss to know whether the tank of small size which minimizes the action on the liquid or the large sized tank which emphasizes the action on the solids is the more desirable. The most intelligent management to-day seems to tend toward the use of small tanks through which the velocity is comparatively high and where sedimentation takes place without, however, allowing room for any accumulated solids. Such tanks are made with inverted conical bottoms at the vertex of which the deposited material is found. By connecting this vertex through a pipe with another tank at a slightly lower level, the solids may be drawn off into a special receptacle where septic action may be continued on the solids alone as long as the capacity of the second tank allows.

In the Travis tank at Hampton, this division of solid and liquid is accomplished by dividing the tank by a horizontal partition so arranged as to leave a slit or opening between the sides of the tank and the partition. By means of two valves, one opening from below this partition and the other from above, the velocity of flow through the two parts is controlled and it is managed so that the velocity through the upper part, comparatively free from suspended matter, is much greater than the velocity through the lower part which contains the organic matter on which the tank is expected to act.

In those cases where continuous operation is claimed for a period of years without any accumulation of deposited material, one may be sure of finding in the effluent small black particles which represent the inevitable loss of deposit to make up for the accumulation of new material. This fine material, as is generally the case with the solid matter acted on in the tank, is comparatively free from odor and may be dealt with far more easily than the raw sludge, and this may be said to constitute another advantage of this tank treatment. Altogether, the value of the septic tank has been much modified since its invention, and inasmuch as the present feeling among engineers and managers is that septic sewage is not desirable for treatment and that in every case a tank should be emptied of sludge at least once a month provided subsequent filtration is practised, the claims of the holders of the septic tank patent rights are not of as much interest as when the value of these patent rights was more highly considered.

Cost of Treating Sewage Chemically

Chemical precipitation of sewage at Providence, R. I., during 1909 required 700 lbs. of lime per million gallons. The volume of sludge produced was 4089 gallons per million gallons of sewage treated; the sludge is pressed and the cake carried away on scows.. The cost of treatment per- million gallons of sewage, as given in the last annual report of Mr. Otis F. Clapp, city engineer was $3.36 for chemical precipitation and $4.42 for sludge disposal. An average daily flow of 19,791,000 gallons of sewage is received at the plant; the settling basins have a capacity of 11,130,000 gallons. The machinery for removing and compressing the sludge consists of two Shone ejectors, which discharge into four storage reservoirs, each 8 feet in diameter and 12 feet long. Thence the sludge is forced under from 60 to 80 lbs. pressure into the presses. The ejectors and forcing receivers are run by air pressuse generated by one 150 horse power and one 50 horse power electrically-driven compressor. Eighteen filter presses are used, each with from 43 to 54 plates with 6-inch centre holes, forming cakes 36 inches square and from $1\frac{1}{4}$ to $\frac{3}{4}$ inches thick between filter cloths which surround the plates. On the average 99.6 tons of sludge cake are produced daily. The pressed cake contain 28.6 per cent of solids. The cost of operation per ton of solids is $2.85.

The Manitoba Clothing Company's store at Winnipeg collapsed recently, owing to the undermining of the walls, caused by excavating for the basement of a new hotel at the corner of Rupert and Main Streets. The contractor for the last named work, Mr. C. W. Sharp, has undertaken to pay for the damage, which is estimated at $25,000.

Tar macadam pavement in Ottawa, Canada, aggregating 1,625 square yards was laid last year by day labor, at a cost of $1.88 per square yard. In the last annual report of Mr. N. J. Kerr, city engineer, it is stated that 8 to 10 inches of spalls were used for the foundation, above which were placed a 3-inch layer of 2-inch broken stone, a 3-inch layer of 2-inch tarred limestone and a 1-inch top coat of $\frac{5}{8}$-inch tarred limestone.

Slow Sand Filtration at Oakland Park, N.Y.

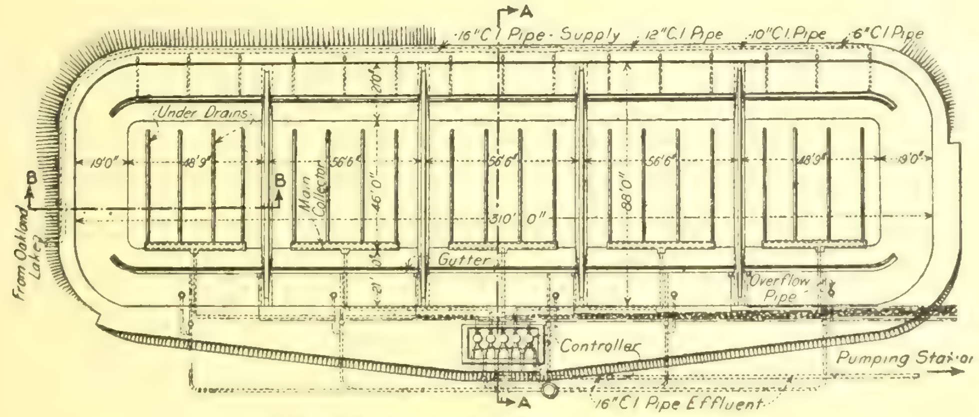
Features of Design of an Interesting Plant at Long Island—Notes on Operation and Cleaning—The "Brooklyn Method"

In order to reduce the shortage of the water supply in the third ward of the Borough of Queens, New York City, the flow from Oakland lake, located about one mile east of Bayside, Long Island, is to be made available for use by the installation of a slow sand filtration plant, on which construction is now in progress. The general plans for the work were formulated in 1907 by Mr. I. M. DeVarona, chief engineer of the Department of Water Supply, who submitted a report in which two tentative slow sand filtration schemes were outlined. One of these involved the use of the Blaisdell machine for cleaning the sand and the other provided for hand washing; the latter method was the one finally adopted, and a site for filters chosen near the present Oakland lake pumping station.

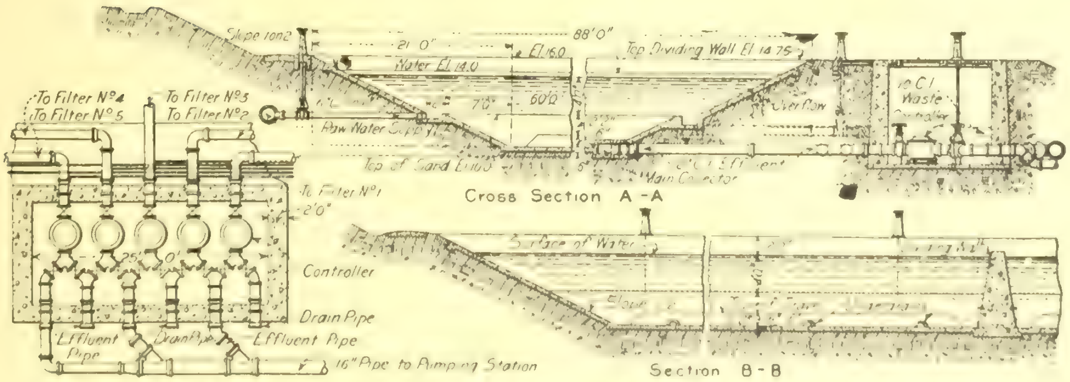
Oakland lake has an area of about 17 acres and a drainage of 1.8 square miles. The lake is fed by springs at its northern end, which consists principally of marsh land. An embankment had been built across the upper end of the lake and the water collected behind it carried by gravity to the pumping station. The taste and odor of this supply, however, were rendered objectionable by growths of algæ and there was always present the danger of contamination from a number of buildings on the watershed. It was estimated that the total supply which could be made available by using the entire drainage area of the lake instead of the small portion at its southern end would be from 1,000,000 to 2,000,000 gallons per day and the purification plant was, therefore, designed to handle this daily quantity of water.

The plant comprises five uncovered slow sand beds, contained by concrete-lined earth embankments, separated from one another by plain concrete division walls, with battered sides, 4 feet wide at the base. The row of five beds is about 310 feet long and 88 feet wide, measured to the inside top of the embankments. The latter have a slope of 1 on 2 and the lining has a uniform thickness of 6 inches. Water from Oakland lake enters an intake at its northern end and flows by gravity through a 16-inch pipe to the filters. This pipe runs along the entire west side of the five units, reducing from 16 to 6 inches in diameter, and from it three 6-inch branches are taken off for each bed making 15 in all. The laternal lines are each controlled by a 6-inch gate valve and all of them are carried through the sidewall embankments so as to discharge into a concrete gutter cast in the lining of the basin. On the opposite side of the basin a similar gutter is cast, its top being just at the elevation of the sand surface.

These gutters are to serve as carriers for the removal



Plan of the Oakland Lake Sand Filters



Transverse and Longitudinal Sections of Filters and Plan of Regulating Chamber of the dirty wash water during the cleaning of the sand. The method to be used is the Brooklyn method, employed successfully at Hempstead, L. I. When the clogging becomes excessive the water above the sand is to be drawn off, the gates on the effluent pipe closed and the one on the waste pipe leading from the concrete gutter to a nearby creek opened. Raw water from the inlet pipes will then be turned onto the bed and allowed to flow across the sand and into the waste gutter. The depth of water will be limited to an inch or so and the sand surface will be raked by hand. This dirt thus loosened will be carried off into the waste channel by the transverse stream of water and the raking continued until a clear effluent has been obtained. The bed will then be smoothed over and its regular operation resumed. The chief advantage of this method of cleaning is that it does not require the removal of the sand from the bed.

The filtering material will consist of 26 inches of sand and 16 inches of gravel, the latter covering lines of 10-inch split tile pipe which serve as the lateral collectors. The depth of water above the sand surface is to be 4 feet. The lateral collectors, of which there are four to each bed, discharge into a main concrete collector from which a 10-inch effluent pipe leads to the regulator chamber.

The regulator chamber measures 11 x 25 feet inside and contains five rate controllers of the balanced valve type. The general arrangement of the piping is shown in one of the drawings. The water leaving the controllers passes into a Y-branch with valves on either leg so that the filtered water may be passed either into a 16-inch cast-iron pipe leading to the pumping station or into 10-inch waste pipes which discharge into a creek nearby. It is expected that the filters will be operated at a rate of about 4,000,000 gallons per acre daily.

A Small Re-inforced Concrete Roof

A building in course of construction in South Bend, Ind., has on the top storey a public hall covering the full size of the building, about 62 x 66 feet, and the owner conceived the idea of a roof garden in connection with this hall and called on the writer to design a roof which would answer his purposes, not only to take the live load desired, but which would be waterproof and at the same time sightly.

The framing of the roof skeleton consists of three roof trusses which set about 16 feet on centres and transversely to the roof trusses are lines of steel beams resting from hangers attached to the top chord of the trusses, the beams being about 6 feet on centres. The concrete roof beams are therefore supported on four sides, 6 feet one way and 16 feet the other, but the roof is designed and built as a monolith, reinforced in both directions.

The entire concrete floor slab rests on its outer edges on the brick wall and expansion is provided for by an annular space 1 inch wide, extending entirely around the slab, the slab itself resting on galvanized strips which were heavily oiled. The slab in $3\frac{1}{2}$ inches in thickness for 6-foot spans and the reinforcement consists of cup bars $\frac{3}{8}$ inch in diameter, spaced 6 inches on centres and lapped about 50 diameters, while transversely, to take care of expansion, are also placed cup bars $\frac{3}{8}$ inch in diameter, spaced 12 inches centre to centre, and having the same efficient lapping.

The concrete was composed of a natural gravel, which was practically free from loam and dirt and graded from coarse sand to pea gravel and larger, but no large stones or pebbles were found.

As tested, the gravel showed about 20 to 22 per cent. voids and, in order to use a concrete uniform through the entire thickness of $3\frac{1}{2}$ inches, so that a mortar coat could be worked up and made a smooth finish when floated and troweled, the mix decided upon was 1 part of Portland cement and $3\frac{3}{4}$ parts gravel.

The concrete was thoroughly mixed in a mechanical mixer, using what may be termed a wet mix, and when floated and troweled presented a fairly good sidewalk finish, and after the forms were removed from under the slab, a good smooth surface was found.

The excess of cement to fill the voids was used not only for the purpose of making a strong concrete, but also to have the natural concrete as nearly waterproof as possible.

In addition, however, to this condition of providing against leakage, the surface will be coated with a waterproofing compound called Liquid Konkerit, which has the natural cement color, but so far no leakage of any description has been discovered.

The roof has a pitch of about $\frac{1}{4}$ inch to the foot, which is the same pitch as is commonly used in sidewalk work, and the result is practically a flat surface, making a desirable floor for the roof garden.

As the contractor had named a minimum price of 35 cents per square foot for the roof exclusive of the trusses or beams, it was decided to do the work by day labor, allowing the contractor $5 per day for his general supervision.

The cost of the roof is covered by the following items, which under more favorable conditions, could be materially reduced as, on acount of scarcity of labor, some carpenters had to be impressed for this work.

Common labor was paid 25 cents per hour; carpenters were paid 35 cents per hour; cement finishers and engine men were paid 50 cents per hour.

Labor erecting scaffold and forms	$ 146.35
Cost of labor on cement roof	230.45
For use of mixer, hoisting engine and supplies	69.85
Lumber for forms and galvanized iron	122.28
Contractor's time	115.00
Steel bars	97.46
Gravel	49.50
Cement	141.75
Waterproofing	60.00
Total	$1,032.64
Credit for flooring	30.00
Total	$1,002.64

Based on 4,000 square feet of roof surface, this shows a cost of 25 cents per square foot, or a saving of $400 on the contractor's bid.

A meeting of the Metropolitan Parks Commission, of Montreal, was held in that city recently, when several questions affecting general improvements were discussed. The principal of these were the advisability of acquiring certain portions of land adjoining the western part of Mount Royal Park, the construction of parkways along the line of the new aqueduct at present being built by the city, and the acquiring of land in Maisonneuve for the erection of a public park, after the lines of the Lafontaine Park. It was decided that the members of the commission should take a trip to Boston and New York, to study improvement work in those cities.

The Canadian Bridge Company, Walkerville, Ont., are commencing the erection of the steel work for the new Cambie street bridge at Vancouver. Resident Engineer Moss is in charge of construction. The substructural work, which is being carried out by Messrs. Palmer Bros. & Henning, is nearly completed.

Albert Street Subway, Regina, Sask.

This work was ordered by the Railway Commission, who apportioned the cost between the Canadian Pacific Railway and the city of Regina as follows:—The Canadian Pacific Railway to pay for all the concrete work and the steel work; the city to pay for the earth excavation, pavements and side-walks; the land damages to be assessed equally between the company and the city.

The work involved over 4,000 cubic yards of concrete, 3,500 yards of earth excavation and 8,000 lineal feet of piling, in addition to the steel bridge to carry four tracks. Operations have been carried on continuously since the date of commencement, without interruption to railway traffic, by means of the construction of two temporary pile bridges, as shown in the photograph. The subway has approaches from Albert street, South Railway street and North Railway street. The total length on Albert street is 682 feet, on South Railway street, 325 feet, and on North Railway street, 225 feet, making a total length on all streets of 1,230 feet. This is by far the largest sub-way west of the Great Lakes. The contractors for the work are the Parsons Construction & Engineering Company, Limited, Regina, Sask.

Construction of the Albert Street Subway, Regina Contractors: Parsons Construction & Engineering Co., Ltd.

Live steam for cleaning forms is employed by the Stewart-Kerbaugh-Shanley Company on the stretch of the Catskill aqueduct known as contract two in the town of Olive and Marbletown, N. Y. The forms are of steel of the Blaw type and the steam is played on them with a hose each time they are stripped from a section of finished aqueduct. The steam is said to be more effective than a stream of water and has the additional advantage of drying the surfaces quickly so that the man who oils the forms follows only a short distance behind the one with the steam hose.

The total for building permits issused at Hamilton, Ont., last month was $324,500, and for the year to date, $2,552,700. Unusual activity is expected in all branches of the building trade next year

Progress view of above work Total length of Subway and Approaches, 1,230 feet.

The Evolution of Rapid Sand Filtration

Application and Functions of the Mechanical Filter—Details of Settling Basins Automatic Operation Desirable — Coagulants — Architectural Appearance

By F. B. Leopold.

Rapid sand filtration is the result of an evolution from what was originally known as the mechanical filter, a closed steel tank, in which was installed a system of gathering pipes and strainers covered with 2½ feet or 3 feet of sand; the water was applied directly to this tank after the injection of a coagulant solution and passed through the sand and gathering pipes on to the distributing system. These mechanical filters used on a turbid water soon clogged with the contained silt, and required frequent washings with the consequent waste of large quantities of water. The gradual filling of the entire sand bed with deposit necessitated repeated renewals of it at considerable cost, the results were generally indifferent and often unsatisfactory.

The next step in this evolution was the wood gravity filter, with a mechanical rake operated by power to assist in the cleansing of the sand. Following this the addition of tanks for sedimentation, and treatment before application to filters, and gradually to the fully developed plant of to-day as exemplified at Harrisburg, Wilkinsburg and McKeesport, Pa.; Lorain, Toledo, Cincinnati and Columbus, Ohio; New Orleans, La., and many other cities. There are to-day upward of 325 plants of this type in operation representing practically every stage of development up to the present state of perfection.

The size, shape and arrangement of settling basins at the present time are probably subject to more divergence of opinion than any other feature of the plant. Advocates of different arrangements advance arguments and results of experience to back their views.

The object to be attained is, of course, such shape or arrangement as will insure as nearly as possible a movement of each particle or drop of water from the inlet to the outlet at the same velocity, and this is much more difficult to accomplish than it seems to the ordinary observer.

In the writer's experience he has reached the conclusion that the shape of the basin may be varied to best suit the location, but the travel from inlet to outlet should be as long as possible without increasing the velocity flow sufficiently to overcome the gravitation of the suspended matter beyond the point of a nearly uniform settlement over the surface of the floor of the basin. The flow should in all cases be horizontally, and the depth of the basin should be as little as economical construction will permit.

A deep basin of any shape is to be avoided, and a round basin of any depth equally so; the size or flow capacity will depend upon the character of the water to be filtered.

The inlet distribution and the outlet gathering from the basins are important considerations and wil materially affect the uniformity of displacement as well as the application of coagulants. The next part to consider is the filter beds themselves. The general design of these is now practically established, and except in details, some of which may be advantageous over others, do not materially vary in principle. These consist of rectangular reinforced-concrete boxes in the bottom of which are built an underdrain system, above which is placed a layer of gravel, on top of this the sand bed, and above the sand bed distributing troughs.

The method of conveying the water from the sedimentation basins to the filter beds will vary with conditions, but the general principle should apply to keeping the velocity in the conduit as low as possible and avoiding whirls and eddies due to numerous sharp bends.

The essential feature in design is to render the plant as nearly automatic as possible in the performance of its functions, thereby avoiding the element of error or neglect on the part of attendants. To this end all possible mechanical appliances for the proper control of operation should be taken advantage of, such as the installation of level controllers in basins, rate of flow controllers on effluent of filters, for maintaining uniform flow, loss of head gauges for recording the friction head lost in operation and indicating the proper time for washing beds, the continuous flow of visible samples from each individual bed, devices for electrically or hydraulically operating valves, the regulation and recording of coagulant, methods of application of wash water and compressed air where used.

These devices are manufactured in a wide range or variety and limitations corresponding to cost by the standard filter builders and it only requires proper knowledge to select such as the size, type of plant and water to be treated may render most suitable or desirable.

In the matter of coagulant, the character of the water will, in a large measure, determine the substance to be used, but plants generally should be equipped for the use of either sulphate of iron and lime or sulphate of aluminum in connection with hypochloride of lime.

Passing the filter, we now come to the clear water storage; the only thing to be considered here is the capacity of storage required, and this must vary with individual conditions. In any case it should be in concrete-covered basins, whether at the location of the plant or as a distributing reservoir located at a distance.

Every water supply, whether purified or not, should have in connection with its supply plant a properly equipped laboratory, and, of course, a purification plant could not be considered complete without one. Here careful daily tests and examinations should be made and complete records of all operations kept.

There is one point where improvement can and should be made, and it is up to the municipalities to do it. That is in the architectural appearance of construction. Probably no public improvement attracts more visitors, bot hlocal and transient, than a purification plant, as it is permanent construction. More attention and money should be devoted to appearances. It would be repaid many times over in advertising effect alone.

Filter Plant Operation

In a paper before the Central States Water Works Association Mr. Paul Hansen, State Sanitary Engineer, of Kentucky, discussed the obligations of water-works superintendents to furnish the public with water of a sanitary quality; and in this connection made the following suggestions concerning filter plants:

"It is unfortunate that the spur of competition, combined with a desire on the part of many municipalities and water companies to secure an installation at very minimum expense, has resulted in the erection of many filter plants unworthy of the name, and which have done much to throw discredit upon the process of filtration in general. Added to this, there is often a lax and unintelligent operation of filter plants, under which conditions even the most carefully designed and constructed installation will fail to give acceptable results. The first duty, therefore, of the water-works superintendent with respect to the improvement of a surface water supply that cannot be adequately protected against the possibility of pollution by patrolling the watershed is to use his influence with the people, the city officials, or his company (should the water-works be privately owned), to install a suitable filtration plant; and he should, furthermore, see to it that competent engineering advice is obtained to insure a design that represents the very best in filtration practice, for be it remembered that the filter plant stands as a bulwark between disease and the consumers.

"This much accomplished, the superintendent should set about to secure intelligent and reliable operation of the plant. In large installations this is best accomplished by employing a trained filter operator, who should be an analyst. When the size of the plant does not warrant this expense the superintendent should himself master the operation of the filters, and should acquire such knowledge of analytical methods as will enable him, with the occasional assistance of an expert, to maintain daily analytical control over the performance of his plant. Such analytical control would involve at most the following determinations: (1) Turbidity; (2) alkalinity; (3) total number of bacteria, and (4) the presumptive test for the colon bacillus. There are now engineers and other experts having laboratories who are prepared to undertake just this sort of co-operative control over filter plants with local water-works superintendents."

In case filter plants can not be or have not been installed for one reason or another, Mr. Hansen suggests the use of disinfecting by hypochlorite of sodium or of calcium. The writer is not prepared to state to what extent definite treatment may take the place of filtration, but it should be observed that disinfection does not remove any of the objectionable physical characteristics of the water; and, moreover, it is apt to impart a medicinal taste to the water which is almost certain to give rise to popular complaint. It should also be observed that different waters require different treatment, and under no circumstances should the hypochlorite treatment be adopted until an expert has been consulted."

Sewer of Interlocking Concrete Pipe

Interlocking, pre-cast concrete pipes are used by the city of St. Paul, Minn., in the construction of an extensive system of sewers known as the Portland-Aldine system. This system embraces about four miles of tile laterals, varying from 9 inches to 24 inches, which discharge into the trunk sewer of concrete pipe. There is about 8,000 feet of this pipe, varying from 3½ feet to 6 feet in diameter. This section runs in open cut to a point near the Mississippi Boulevard, on the high bluff above the Mississippi River, where it terminates in a shaft, dropping the grade 130 feet to a concrete lined tunnel, 1.400 feet long, which discharges into the river.

The interlocking reinforced pipe was made on the ground. The pipes are made uniformly in lengths of three feet. The ends are designed so that they key into each other, similarly to a bell and spigot, with the reinforcement interlocking between sections. A small space is left for a mortar joint, which produces a continuous water tight pipe line when sealed. The pipe sections are cast in steel molds.

The reinforcement consists of flat steel hoop bands, spaced about 1 foot apart, and longitudinal flat bars, slotted into the bands at the intersections, and projecting slightly beyond the face of the concrete in the ends of the pipe to form hooks into which the corresponding bars of the next pipe lock. The number and size of reinforcing bars vary with the size of the pipe, but the steel runs in general about ¼ inch thick and from 1½ inches to 2¼ inches in width.

The steel forms for the pipes are made of several sections of sheet metal, which are clamped up on a cast iron base and bound by steel hoops at the top. The cast iron base is shaped to form the socket of the pipe on the bottom, while the key in the top is formed by a shaped ring, which is clamped on and concreted after the body of the pipe has been cast.

Concrete for the pipes is mixed in the proportion 1 cement to 5 pit gravel. It is mixed in a Smith mixer and delivered to wheelbarrows which are lifted and emptied into the forms by the barrow-men. The concrete is compacted and worked in the form with a narrow tool. The forms are thoroughly cleaned and oiled before being erected. They are removed in one day, cleaned, and set up at another point further along the line of the sewer. In this way, the pipe work preceds the excavation, and pipes are distributed along the line of the work as needed. They are kept far enough in advance of the pipe laying to permit a thorough curing before they are put in the work.

The excavation of the sewer trench is being handled by a steam shovel and a cableway. The material is clay, underlaid by sand and gravel. A Vulcan "Little Giant" shovel with a long boom is supported on timbers laid across the trench. It takes out the bulk of the material. The trimming is done by hand, and the material loaded into buckets on the cableway. The trench is from 18 to 21 feet in depth.

The concrete pipes are rolled to the side of the trench on timber runways, and then picked up and carried to place by the cableway. The trench is back-filled over the pipe by means of a large scraper, and with the aid of the cableway.

The tunnel section of the sewer is elliptical, with diameters of 4½ feet and 6½ feet. The top of it is in rock, and requires no lining. The lower half is lined with concrete, with a granite block paving in the bottom. The shaft leading from the pipe section to the tunnel is lined with glazed brick.

According to information received from Penticton, B.C., thirty-five miles of the Kettle Valley line between Midway and Bull Creek are now under construction, a gang of some 200 men being employed. The preliminary survey line from the hydraulic summit of the divide between Penticton and the Kettle River district to Penticton has now been run for ten miles, and will, it is expected, be completed before snow falls.

At Victoria, B.C., a dispute over the city's method of awarding tenders has resulted in the resignation of the city solicitor. The facts as reported are that the Worswick Paving Company have submitted a number of tenders for street paving. The company's tenders have been based (a) upon the specifications of the City Engineer and (b) upon specifications prepared by the company itself. In every case, as we understand the circumstances, the concern has obtained its civic contracts upon bids based upon its own specifications. The question as to the legality of contracts so awarded was never raised until other companies entered the field and asked for equal treatment with the Worswick Company. Only when a rival paving company appeared and secured a contract upon precisely similar conditions as had been accorded the Worswick Company did the city solicitor make the belated discovery that the whole thing was irregular and that ratepayers could not be held liable for the cost of works executed under such a system. He resigned on account of his inability to convince the city council of this "irregularity."

The J. I. Case Threshing Machine Company, of Racine, Wis., have hit upon a practical plan for furthering the interests of the good roads cause in Kenosha County, Wisconsin. With a view to giving this and the neighboring County of Racine an object lesson, the company has made an enterprising proposition to the authorities, namely, to furnish the necessary machinery, consisting of 10 ton road rollers, engines, scrapers and other equipment, together with a full complement of men, for the construction of a model road between Racine and Kenosha, the only condition being that the authorities deliver and spread the necessary gravel and supply culverts for drainage. There is general confidence in J. I. Case products, and it may be ventured safely that the proposition made by this progressive concern will be taken up.

The Contract System vs. Day Labor

Some Pertinent Observations by a Toronto Paving Contractor—Concerning Various Civic Expenses that should properly be Charged to Day Labor

Toronto, Nov. 3, 1910.

Editor "Contract Record".

I have read with interest all the articles and communications appearing in your recent issues under the heading of "The Contract System vs. Day Labor" in the carrying on of civic work. It appears to me that there is much yet to be said against day labor, particularly as it is worked out in Toronto, where the Local Improvement law prevails.

Assistant Engineer Powell in his communication, speaking no doubt for the department, says: "The engineer is, of course, anxious to do his own construction work." I quite agree with him that he is anxious to do his own construction work. But why should he be? Would it not suit him just as well to have it done by contract so long as he had the making of the specifications and the supervision of the work? What a lot of trouble it would save him, and how much more time he would have to devote to his legitimate engineering duties! And how much more would be the saving to the city in this way! How frequently has he been brought on the carpet by the City Council and Board of Control, charged with delay and inefficiency with regard to his engineering duties! And the burden of his excuse has been: "too many duties;" "too much to do;" "overworked." What a saving there might have been to the city in fees for expert engineering advice if our engineer had devoted his whole time to these duties instead of chasing after this day labor business! Take for example his having to send to Chicago for an engineer to come to Toronto to tell us where our street cars should turn after delivering their passengers down town, or in what direction the currents of the lake run in the vicinity of the city, and other such local matters. Who should be the best expert in these matters but the engineer, who has spent most of his life in the service of the city? And he would be, were not so much of his time taken up with looking after the detail work connected with the carrying out of his desire to do his own construction work. These arguments apply equally to day labor in other large cities.

However, my primary object in this communication is to point out some of the reasons why civic paving work under the local improvement provisions of the Municipal Act should not be allowed to be done by day labor—and **would** not be allowed, for one instant, to be so done, were the works carried on under a commission instead of under the municipal system.

The Local Improvement Act demands that the whole cost of the work be levied against the property benefited, the city paying its proportion on the frontage at street intersections. This intention is carried out in all cases where the work is let by contract, but not where the work is done by day labor.

Take the streets that have been previously paved and paid for under the Act. The material on it belongs to the property owners who paid for it; yet, under the specifications, where a new pavement is being put down, the contractor is bound to carry all this material to the city's yard, and the property owners on the street are thus not only deprived of the benefit of its value, but they are charged (as part of the cost of the new pavement) with the expense of hauling it away. The city afterwards uses the material in day labor work, instead of giving those who paid for it the benefit of it.

Take for instance the pavement now being laid on Yonge street, from King to Front. It was previously paved with stone blocks. These blocks are being hauled by the contractor to the city's yard at Frederick street, and the cost of hauling is part of the expense of the new pavement. Now if the specifications provided that this material went to the contractor, the tenders for the work would be that much less, and the property owners would thus righfully get the benefit of their own material in the reduced cost of the new work.

But following up what becomes of this material: those of these blocks fit for use are again used by the city engineer in his day labor work, or if they are unfit for use again as blocks they are crushed by the city into broken stone and are worth $1.10 a ton at the crusher for this purpose. Thus the engineer gets broken stone for the cost of crushing it—about 20 cents a ton, while the contractor pays $1.30 for his crushed stone. Thus the ratepayers on one street are being robbed of their material, while those on another street—if they are fortunate enough to have their pavement laid by day labor—get a corresponding benefit, and the engineer comes out at the end of each year and reports that he has saved the city so many thousands of dollars by the use of day labor. This is going on continuously with regard to all kinds of valuable material that is taken off the streets where the old work has been done and paid for under the local improvement system. And yet the engineer persists in saying that he competes with the contractor on equal terms.

But this system of robbing Peter and dividing up with Paul is not the only objection to the day labor system as applied to Toronto.

The city, several years ago, at a very great expense, purchased and paid for out of the general tax, an asphalt plant, ostensibly to make repairs to asphalt pavements on expiry of the contractors' guarantee period—and to this extent may have been justified. But to what use has it been turned in connection with the engineer's pet day labor business? Not merely to enable him to compete for new work on most uneven terms with the contractor, but to distribute unfairly the cost of the work. Why should he have Jarvis and other streets re-surfaced with asphalt as a local improvement to be paid for by the ratepayers on the street, and give the ratepayers on other streets, such as Dupont street from Avenue road to Walmer road, a new asphalt surface at the general expense? The ratepayers on one street are not only made to bear the whole of the expense of their own improvement, but to contribute to the cost of the others? If these streets had been resurfaced under contract let by tender, the cost would necessarily have been done as a local improvement, but under the system as operated in Toronto the engineer is enabled to slip the cost through under the guise of asphalt repairs.

These are only some of the instances of how the day labor system is being worked out at the City Hall, which justifies one in asking whether these liberties do not constitute one of the reasons why the engineer is anxious to do his own construction work.

It would be interesting to figure out how much of these "savings to the city," reported by the engineer from year to year under hi sday labor system, has been taken from the city at large by reason of the city's bearing the cost of civic yards, office accommodation, material, plant, implements, wages, insurance, repairs and daily expenses, etc. The contractor has to provide for these items, but they are not included in the making up of the cost of work done under day labor. What a complex set of books and accounts would have to be kept in the Engineer's Department to make each local improvement bear its own proper share of the cost of all these various items that should properly enter into the cost of the work!

If the city is going to carry on a contracting department, why not have it separate and distinct from the engineering work, and run on business principles? If this were done the contractor would have little to fear so far as the cost of the work is concerned from the competition. But then, this would be illegal, as the city has no power or authority under the Municipal Act to carry on any such general business. As well might it undertake to go into any other line of business, such as constructing the people's houses or running a departmental store to supply them with goods so as to reduce the cost and incidentally drive the legitimate business man to the wall.

These are only some of the objectionable features of the day labor system as against legitimate contract work, but I will not take up more of your space now. In my next I will give you some more observations, and also some further reasons that appear to me to indicate why the engineer and some of the cixic representatives are so strongly in favor of day labor.

Yours truly,
James Pearson.

Trade News from Winnipeg

It is estimated that perhaps 7 to 8 per cent. of construction awaits completion, and with a plentiful supply of labor and material, the chances are good for this.

In the statement that the building year has practically closed, reference is made only to new works of magnitude, of which there appear to remain these two bank structures.

The season has been marred with only one labor dispute of any consequence. There have been no undue inflations of the supply market. Everything is in excellent shape for 1911, the prospects of which are discussed freely. Probably at no other like period of the city's history has an optimitic outlook been more justified.

With the active building season practically closed, contractors may well look back upon 1910 as a banner year. With the great influx of building activity, the supply houses have increased and manufacturing concerns have had to enlarge their plants in order to obtain a larger output. While everybody predicted a good building year at Winnipeg, few expected to see last year's total exceeded by five millions! Of the exceptions may be mentioned Building Inspector Rodgers, who made a forecast of fifteen million dollars. With nearly two months to go, there is something more than a million dollars required to make up this total. Of this amount the Bank of Commerce permit will supply more than $700,000 and that for the Sterling Bank the remainder.

We have received from the Manitoba Bridge and Iron Works, Limited, Winnipeg, a copy of their latest catalogue on structural steel and iron products. In this catalogue various illustrations and tables will be found which enable any architect or contractor to determine just which sections and weights for the different members in the design can be used to best advantage.

To the Robb Engineering Company, Limited, Amherst, N.S., we are indebted for catalogues of steam boilers and steam specialties and also an illustrated description of the Robb Mumford water tube boiler. Readers of the "Contract Record" interested in these lines do well to investigate the claims made for these goods.

Building permits issued to date at Brantford, Ont., represent a total of $519,000. The previous record was $509,000 for the whole of 1907.

Canadian Railroad Development

The Canadian Pacific Railway is to construct a dam on Bigstone Creek, near Red Deer, to form a 1,000,000-gallon reservoir.

McMillan Bros., Winnipeg, Man., have started work from the Entwistle end of their 70-mile contract on the main line of the Canadian Northern Railway, west of Edmonton. Work is to be carried on all winter. Sub-contractor Phillips now has 300 men at work near Entwistle.

The members of the Transcontinental Railway Commission and C. M. Hays, president of the Grand Trunk Pacific Railway, recently spent some time in Quebec looking over the proposed site of the Transcontinental terminals and the available localities for the erection of work shops for wharf extensions.

The Canadian Pacific Railway, according to a statement of William Whyte, Vice-President, will probably not take up the building of the proposed Sedgewick-Strathcona cutoff on the Winnipeg line, which now joins the Calgary and Edmonton at Wetaskiwin until next year. This is one of the important branches to be constructed, owing to its reducing the distance from Winnipeg to Strathcona on the C. P. R. to within twelve miles of the new connection of the Grand Trunk Pacific.

Assurances have been given that at the forthcoming session of Parliament an appropriation will be made for the commencement of the construction work on a new Welland Canal. The original idea was to enlarge the present canal from Port Colborne, 10 miles, and then construct a cutoff. Surveys, however, are said to have disclosed a dangerous bed of quicksand on the route of the cutoff, and an entirely new canal is now proposed. It would start about 6 miles west of Port Colborne and have its outlet at the mouth of the Jordon river, a distance of 22 miles.

A case of interest to sub-contractors on the Transcontinental railway was that of the Traders Bank vs. Swan Swanson, of Dryden, Ont. The bank sued and secured judgment on a note made by Swanson for $32,000. Swanson admitted the debt, but said that the arrangement with that bank was that the note was to be renewable until he secured the money for his sub-contract from the government contractors. This amounts to about $68,000 and is held back on account of the dispute between the engineers of the Transcontinental Commission as to classification. Mr. Justice Latchford held, however, that the note was due and rendered judgment accordingly.

Good headway is being made by the Dominion Government in determining the final route of the proposed Hudson Bay Railway, from The Pas to Hudson Bay. Survey party No. 1, in charge of Engineer W. J. Clifford, has returned from its work on that section of the line known as the first section, located between The Pas and Landing Lake, a distance of about 200 miles. The two other survey parties in the field, in charge of Engineers F. P. Moffat and J. P. Gordon, are rushing the work in their respective sections as fast as possible and before another year has passed the Government hopes to be in possession of enough detailed information to allow the commencement of construction on the railroad.

The Portland Canal Short Line Railway Company, a Mackenzie & Mann project, is to apply to the legislative assembly of British Columbia at its next meeting for amendments to its charter. The legislation now sought is to authorize the company to extend its line from the terminus at present provided for (some 16 miles out of Stewart, B. C.), in a general easterly direction to the eastern boundary of the province, at or near where the Peace river intersects the boundary, from which point it would naturally be extended under an Alberta charter to connect with the existing Canadian Northern services at Edmonton. A Dominion charter will also be sought for this new road.

WE MANUFACTURE

HOUSE TRIM Pine and Hardwood

Special attention given to

Chestnut Trim

Estimates promptly given for quick and good work

The Tillson Co., Limited
Tillsonburg, Ont.

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Personal News and Notes

Calgary spent over half a million dollars in new buildings last month, the exact total being $568,490, as compared with $403,050 for October, 1909.

At London, Ont., building permits issued to October 31, represent a total of $710,315, compared with $780,504 for the corresponding period of 1909.

Mr. C. W. Sharpe, chairman of the Winnipeg Parks Board, has submitted to the Board of Control a proposal for a fine boulevard encircling the city. The cost is not expected to exceed 20,000.

Mr. F. W. Morse, of Montreal, formerly vice-president and general manager of the Grand Trunk Pacific, has been appointed general manager of the Alton and Clover Leaf Roads, with headquarters at Chicago.

Mr. W. P. Tierney, of the railway construction firm of Tierney & Company, reports good progress on his ten-mile contract for the C. N. R. in British Columbia between Matsqui and Sumas river. Labor is reported by Mr. Tierney to be fairly plentiful now that work on the coast is easing up for the winter months.

A recent visitor to Montreal was Mr. J. W. Stewart, of Foley, Welsh & Stewart, the well-known railroad contractors. The objective of Mr. Stewart's visit was a conference with President Hays in regard to G. T. P. construction work. During the past year Mr. Stewart has been almost constantly at the coast supervising the construction from Prince Rupert to the Yellowhead.

Mr. Peter Lyall, Jr., of the Lyall-Mitchell Company, Winnipeg, returned to that city last week from Toronto, where he had been to make final arrangements for the erection of the new Bank of Commerce building in the western capital. The proposed structure will have a frontage of 104 feet on Main street, and will cost approximately $750,000. The building will rest on thirty caissons, approximately 50 feet deep to rock. It will be fireproof throughout, and is to be ready for occupancy by June, 1912.

Over a square mile of buildings has been demolished in the construction of the new terminal facilities at Montreal for the C. P. R. Remarkable progress has been made with this work, upon which some 300 men are engaged. Twelve of the twenty new tracks are already in use. Work on the Notre Dame street viaduct is proceeding rapidly and all the concrete foundations are in place. The new station building itself is beginning to take shape and much of the necessary steel work is already up. Great changes are contemplated for the Place Viger hotel, which will be considerably added to, making it one of the finest hotels on the continent.

Dr. J. A. Waddell, of the firm of Waddell & Harrington, consulting engineers, Kansas City, paid a visit recently to Vancouver, B. C. This firm designed the Granville Street and Westminster Avenue bridges, at Vancouver, and are at present at work on the Cambie Street bridge, the construction of which is progressing favorably. Messrs. Waddell & Harrington have submitted plans to the Burrard Tunnel and Bridge Company for the Second Narrows bridge, which is in the vertical lift class. The firm have just completed two small plain bridges at Portland and have two larger ones under construction. One of these is to cost a million and a half dollars, while Mr. Waddell estimates that a bridge across the Second Narrows would cost about $1,300,000. We understand that there are only three vertical lift bridges in America at the present time, and that the Kansas City firm have built all three. They anticipate great activity in bridge construction in British Columbia, and are making every effort to develop their business in that province.

Smokestacks

We can build them quick of the right quality and at the right price.

Boilers

Do you need a boiler? Let us quote you. We guarantee our Boilers and stand behind our guarantee.

Steel Tanks

We make all sizes and shapes for water, oil or anything else. We make them right and tight.

We have the facilities for manufacturing these goods quickly and in the best manner. We will be glad to quote.

Marsh & Henthorn, Limited
Belleville, Ont.

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."
—The Philosopher of Metal Town.

"METALLIC"
Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

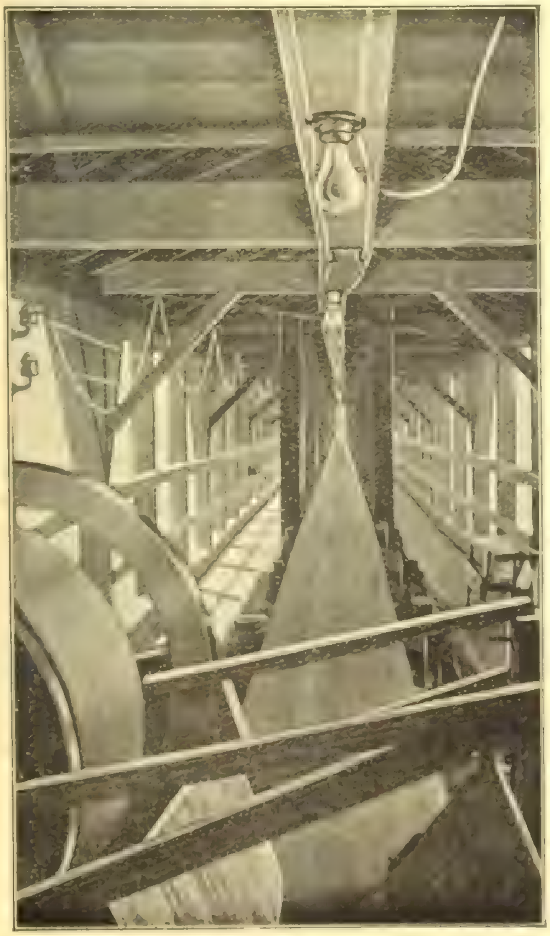
for Elevators, Mills, Storehouses and Factories.

Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers 19

The Metallic Roofing Co Limited
TORONTO & WINNIPEG



Scandinavia Belting

FOR CONVEYING AND TRANSMISSION

Scandinavia Belt is considered the best Conveyor Belt that has ever been put on the market, for conveying Ore, Rock, Cement, Clay, etc.

It is not made in plies, and will not come apart.

Equally good in wet and dry places.

This illustration shows 20" Extra Stout Scandinavia Belting for conveying Cement.

Write for Bulletins, price lists, and discounts.

Federal Engineering & Supplies Limited
284 Yonge Street, TORONTO

AGENTS: Power Economics Ltd., Montreal. McDougall Hardware Co., Ottawa
Marks-Clavet-Dobie Ltd., Pt. Arthur. Great West Saddlery Co., Calgary

Agents Wanted in Other Cities

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited

Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. [illegible]

Steel and Wood **TANKS**

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

The Original

MARSH-PAUL
AIR VALVE

Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture — also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

ORNAMENTAL
IRON WORK
WIRE CLOTH AND
WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our
WINDOW GUARDS
Insist on having HARD STEEL WIRE
WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

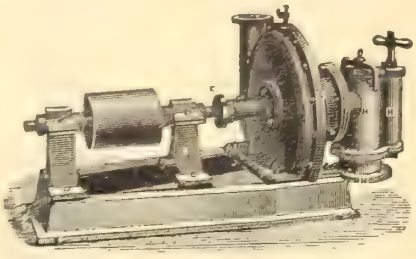
Write for Catalogue

Main Office - 90 West Street
New York City

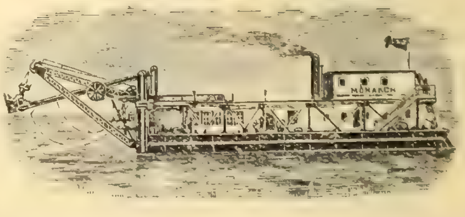
M. Beatty & Sons, Limited
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



THE WARMEST SHEATHING -WIND AND FROST PROOF

Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of obsorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.

Limited

Home Bank Building - Toronto, Ont.

Works: Port Credit, Ont.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

ENGINES and BOILERS of all types and sizes. Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established 1882

THE COMMERCIAL

The WEEKLY FINANCIAL COMMERCIAL & GENERAL TRADE NEWSPAPER of the GREAT WEST.

Winnipeg Manitoba

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.

Limited

Phone 423 and 2457

HEAD OFFICE :

Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

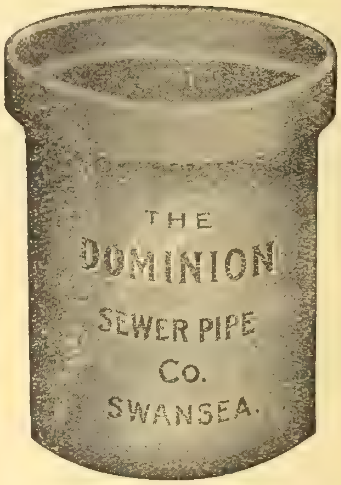
Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

**The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.**

SWANSEA

**Salt Glazed and Vitrified
SEWER PIPES**



**True to Size.
Impervious to Water.**

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

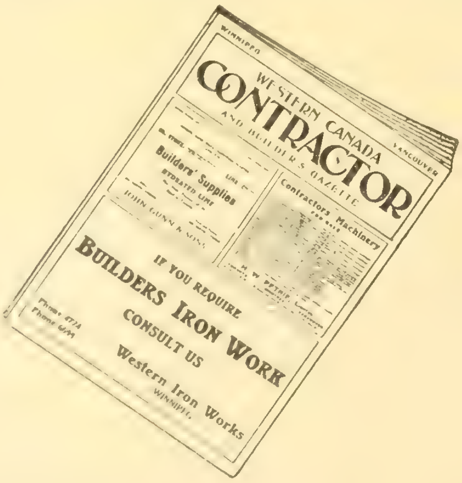
**Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts**

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



WINNIPEG WESTERN CANADA CONTRACTOR AND BUILDERS' GAZETTE VANCOUVER

Builders' Supplies

Contractors Machinery

IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

**American
Sewer Pipe Co.**
General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

**Vitrified Salt Glazed
Sewer Pipe**
in the WORLD

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW,
President.

R. H. NEW,
Vice-President.

The Most Satisfactory Sewer Pipe that is being offered to Canadians

We aim "and our aims are realized" to make the best line of Vitrified Salt Glazed Sewer Pipe that is being offered to the Canadian trade. The consumers, contractors, corporations and dealers throughout Canada mostly prefer our product, quality being their first requirement. Then, too, we pay special attention to inquiries.

Prices, and last, but most important, "DELIVERY"

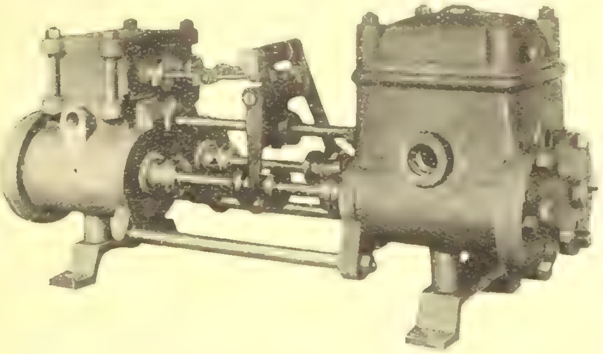
You simply cannot afford to buy elsewhere

The

Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co.

Limited
Campbellford, Ont.

Bridge over Spanish River at Massey, Ont.

**Steel Bridges, Steel Buildings
Roof Trusses**

and other Structural Steel

Foundry and Machine Shop in connection.

Estimates on application

Water - Power Plants

Units from 1-4 up to 18000 R built

for any head and any output

—Highest efficiency—

CENTRIFUGAL PUMPS
PAPERMAKING MACHINERY

Apply to

Escher Wyss & Co., Limited
(London, England)
Office: 109 Victoria Street, Westminster, S. W.
Works: Zurich (Switzerland)

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

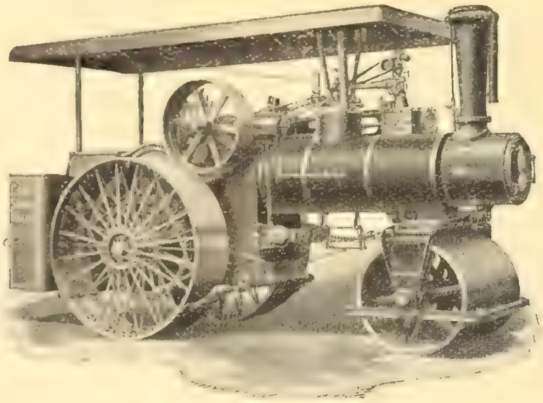
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

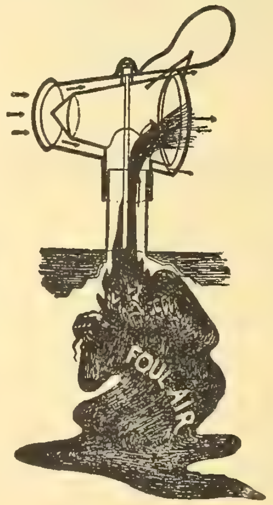
Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work
and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

- Roofing Slate
- Red Slate
- Green Slate
- Mottled Slate
- Black Slate
- Blackboards Slate
- Structural and Electrical Slate
- Terra Cotta Tiles
- Asphalt Pitch
- Tar
- Asbestos Sheathing
- Building Papers
- Tarred Felts
- Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

- Glass Wired and Rough Rolled
- Galvanized Sheets
- Black Sheet
- Copper Sheet
- Tinplates
- Canada Place
- Zinc Sheets
- Corrugated Iron
- Gutters
- Pipes
- Elbows
- Spikes
- Nails
- Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C.E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, **Vancouver, B. C.**

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Toronto and Winnipeg

John Galt John Haddin

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.

67 Esplanade E.,
Phone Main 7692 **Toronto, Ont.**

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. **Montreal**

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for ox lots:—

	Single		Double	
reaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
00 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, 2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 0 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

'loor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.

'loor Tile—½-inch square, 65 cents.

Vall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

itreous Tile—All sizes, according to color, 55 to 65 cents.

lazed—White, 6 x 3 inches, 55 cents per square foot.

latt—Dull finish colors, first, 70 cents.

apping Coves and Corners, special quotations to suit requirements.

palite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

hite glass, installed, 6 x 3 inches, 80 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

tandard compression work, 65 per cent.

ligh grade compression work, 60 per cent.

'uller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

'latway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

o. 4 compression bath cock	net $1.65
o. 4½ Fuller's	net 2.25

quare head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

lot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

0-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

6 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

ead pipe, 80 per cent. off; lead waste, 80 per cent. off caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b. Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, $1.05 per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

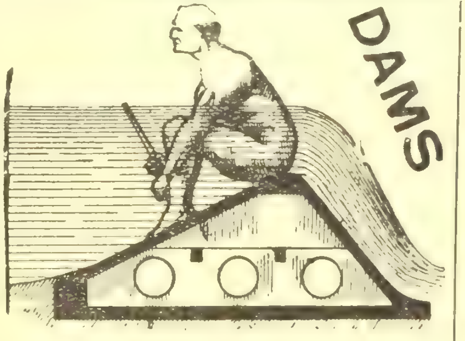
The Lachine Motor Works, Montreal, Que., are stated to have dissolved.

The assets of Jno. Morrison & Son, Ltd., Montreal, Que., plasterers, are stated to be [illegible].

The General Contracting Company, which had the contract for the grand stand at the Exhibition grounds here, has assigned, it is reported, to E. R. Clarkson, of Toronto.

JAMES TAYLOR Consulting and Inspecting Engineer
P.O. Box 95, Station B., Montreal, Canada
[illegible]

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
The KATIE Foundry,
Galt, Ont.
Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

The
"Simplex" Stone and Marble Cutter

No need of carrying a heavy load of tools. Use "Simplex" handles with adjustable cutters. Cheaper than sharpening and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

"The best is cheapest"

"Sanorto"

Composition Flooring

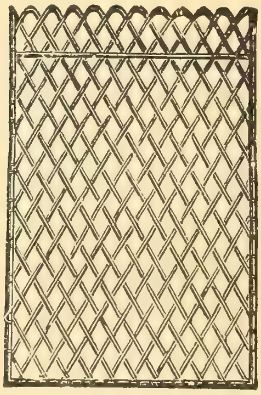
Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

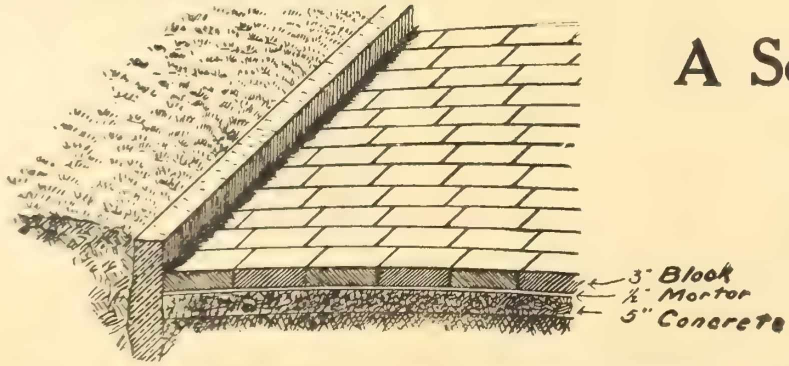
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

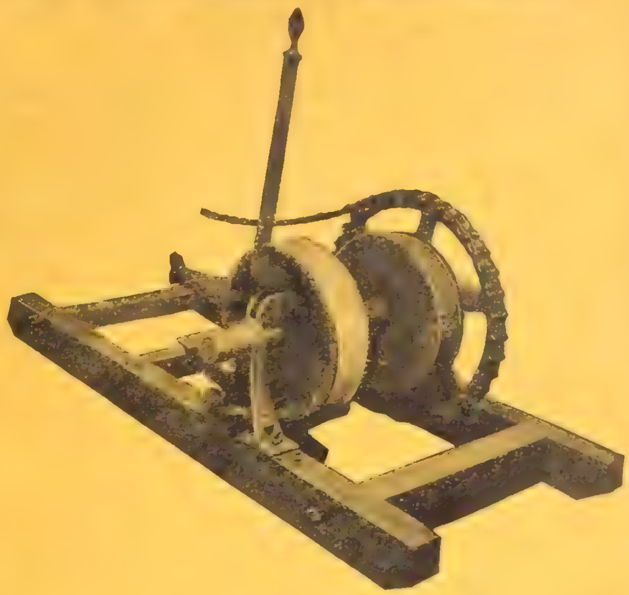
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work | Mortar Conveying | Well Digging
Bridge Building | Sewer Building | Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited

Engineers and Machinists

London, Canada

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.

Toronto Agent
A. P. STEWARD - Builders' Exchange

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

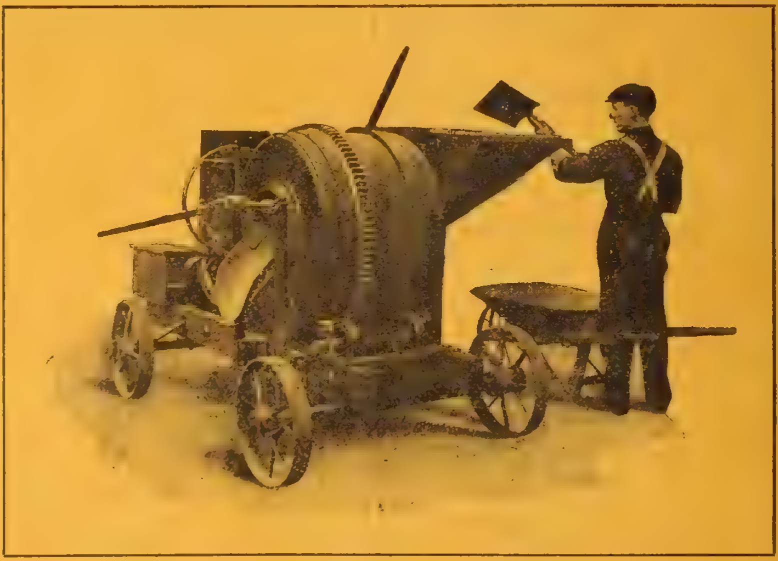
Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

"The Ransome"

Everybody who builds concrete walls, concrete walks or curbs, concrete anything, can have the best concrete that can be made at the least possible cost, because our new No. 4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an exact reproduction on a small scale, of the ransome that made the correct mixing of concrete cheap—it's the same wonderful mixer in miniature. This is the first really modern, effective, and economical small mixer ever put on the market.



No. 4 Ransome Equipment

This machine is equipped with Gasolene Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates and all necessary Engine and Mixer fittings—an absolutely complete outfit, ready for perfect operation.

Mixer, with engine, Charging Hopper on Trucks complete, weighs 1750 lbs.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

Vol. 24 Toronto, November 16, 1910 No. 46

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

STEAM AND POWER PUMPS

AM.Ex.

PACKED PISTON PUMPS

For any service up to a water pressure of 150 pounds.

CENTRE OUTSIDE PACKED PLUNGER PUMPS WITH POT VALVES
Specially adapted for marine work.
AUTOMATIC FEED PUMPS AND RECEIVERS. COMPOUND DUPLEX PUMPS. INDEPENDENT JET CONDENSERS. CENTRIFUGAL PUMPS. OIL SEPARATORS.
All suitable for export. Write for Special Prices and Discounts.

THE SMART-TURNER MACHINE CO. LTD.
191 BARTON ST. EAST, HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

Heavy "Imperial" Plug Drillers

For trenching open cut work and shaft sinking where compressed air is available, imperial MB-13 and MB-23 Plug Drillers should form a part of every equipment.

They are hand hammer drills of enormous capacity!

Used for down holes only

CANADIAN RAND CO., LIMITED
Commercial Union Building, MONTREAL, QUE.

Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page
Canada Wire Goods Mfg. Co 54
Dennis Wire & Iron Works 10

Belting
[illegible] Engineering & Supplies, Ltd 51

Boilers
Inglis, John 24
Jenckes Machine Co 2
Leonard & Sons, E 55
Marsh & Henthorn 51
McDougall Caledonian Iron Works 31
Mussens Limited 32
Taylor-Forbes Co 63
Waterous Engine Works Co.......

Brick
American Enamelled Brick Co.......
Canadian Pressed Brick Co........ 55
Don Valley Brick Works.......... 7
Hamilton Pressed Brick Co........ 10
Milton Pressed Brick Co............
Port Credit Pressed Brick Co......... 55
Toronto Pressed Brick Co. ....

Bridges (Steel)
Canadian Bridge Co................ 52
Cleveland Bridge Co. 52
Dickson Bridge Works...... ....
Dominion Bridge Co............... 52
Phoenix Bridge and Iron Works.... 53
Pennsylvania Steel Co. 52

Builders' Hardware
Taylor-Forbes Co.................... 63

Cement
Alsen Portland Cement Co.......... 62
Britnell & Co 22
Bremner, Alex........................ 59
Canada Cement Co 3
McNally & Co., W.................... 55
Morrison & Co., T. A................ 60
Rogers, Alfred.......... 4
Rogers Supply Co.................... 31

Conduits Page
Conduits Co., Limited......... 59

Concrete Pipe
Lock Joint Pipe Co........ ....

Concrete Mixers and Machinery
Canada Foundry Co................ 15
Cropp Concrete Machinery Co...... 6
Goold, Shapley & Muir...... 9
Hopkins & Co., F. H............. 64
Jenckes Machine Co................ 2
London Concrete Machinery Co.... 23
Mussens Limited.................... 32
Morrison & Co., T. A............. 60
Rogers Supply Co................... 31

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 61
Buffalo Steel Co...................... 53
Canada Wire Goods Mfg. Co...... 54
Hamilton Iron & Steel Co........... 22
Trussed Concrete Steel Co........ 12

Contractors' Plant
Beatty & Sons, M. 54
Factory Products Limited..........
Hepburn, John T................... 17
H. & E. Lifting Jack Co..........
Hopkins & Co., F. H.............. 64
Katie Foundry Co.................. 61
Marsh & Henthorn................. 51
Meaford Wheelbarrow Co 21
Mussens Limited.................... 32

Crushers (Stone and Rock)
Hopkins & Co., F. H............... 64
Jenckes Machine Co................ 2
Mussens Limited.................... 32
Morrison & Co., T. A.............. 60

Corrugated Iron
Galt Art Metal Co.................
Metallic Roofing Co............... 51
Metal Shingle and Siding Co....... 20
Ormsby, A. B., Limited............ 5
Roofers Supply Co................. 59

Contractors Page
McIlwraith, Jas. A................. 60
Nadel & Adler..... 60

Drills
Beatty & Sons, M 54
Canadian Rand Co.................. 1

Deafening Felts
Cabot, Samuel, Inc................. 55

Drilling Contractors
Harvey, J.......................... 61

Dredges
Beatty & Sons, M 54

Engines
Canadian Boving Co...............
Inglis, John 24
Jenckes Machine Co..... 2
Leonard & Sons, E................ 55
Mussens Limited........ 32
Waterous Engine Works Co........

Excavators
Harris, J. W........................ 11

Electrical Apparatus and Supplies
Factory Products Limited..........
Northern Electric & Mfg. Co......... 34

Engineers (Civil and Mechanical
Barber & Young..................... 60
Chipman & Power.................. 60
Bowman & Connor................ 60
Farmer, John T..................... 60
Fuce, Edw. O........................ 60
Galt Engineering Co., John........ 60
Glaubitz, H. J...................... 60
Hunt & Co., Robt. W............... 55
Inglis, John 24
Kennedy, Jas. C..................... 60
Lea & Ferguson..................... 60
Mace, T. Harry.... 60
Mitchell, C. H....................... 60
McRae, John B...................... 60
Moore & Scollan..................... 60
Taylor, James....................... 60

Fire Apparatus Page
Factory Products Limited..........
Morrison & Co., T. A............ 60
Seagrave, W. E..................... 23

Fireproof Doors and Windows
Douglas Bros........................ 14
Mussens Limited........... 32
Ormsby, A. B........................ 5

Gauges, Steam, etc.
Marsh, Jas. P....................... 51

Granite and Marble
Laurentian Granite Co............. 60
Missisquoi Marble Co..............
Rogers Supply Co................... 31
Smith Marble & Construction Co..

Glass
Chance Brothers & Co............... 18
Consolidated Plate Glass Co......... 58
Luxfer Prism Co..................... 2
Thompson & Co., B. & S. H......... 18
Toronto Plate Glass Importing Co.. 1

Heating Apparatus
Jenckes Machine Co.................. 2
Leonard & Sons, E................. 55
Taylor-Forbes Co.................... 63

Hoisting Machinery
Beatty & Sons, M.................... 54
Factory Products Limited..........
Inglis, John 24
Jenckes Machine Co................. 2
Hopkins & Co., F. H............... 64
London Gas Power Co.............. 63
Marsh & Henthorn.................. 51
Mussens Limited.................... 32

Hydrants
Canada Iron Corporation............ 59
Gartshore-Thomson Pipe Co....... 58
Kerr Engine Co......................

Interior Fittings
Lickleys Limited. 16

Lime
Christie, Henderson & Co........... 17
Jamieson Lime Co.................. 19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

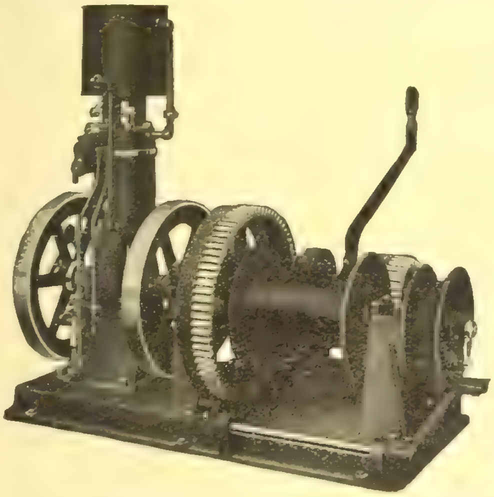
Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 **28 King Street West, TORONTO**

Climax Hoisting Engine

for running two platform Material Elevators

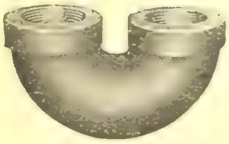


Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company
Hamilton, - - Ont.

Semi Steel Fittings



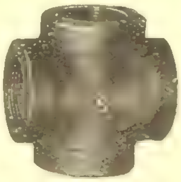
RETURN BEND

PIPEHANGES

Y BRANCH

REDUCER

HEADER



CROSS

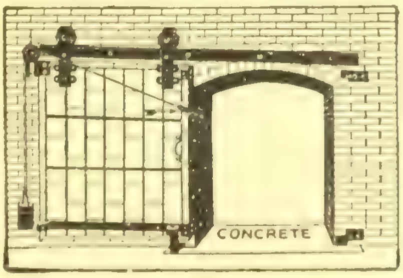
A fitting for every purpose
TRY THEM

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

It is for Your Benefit we Label our Doors

Substandard Doors cost less money to make but mean a lesser Insurance allowance. **Proportionately, Labelled Doors give much larger returns** through Insurance allowance than do unlabelled goods.

Specify Ormsby "Underwriters" Fireproof Doors. Get all that is coming and the most for the money invested.



Experts in Fireproof Windows, Doors and Skylights.

A. B. ORMSBY, Limited
Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: HAGERSVILLE, ONT.

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
[illegible] Limited	10
[illegible] Ltd	40
[illegible] & Sons, J. R.	[illegible]
Georgian Bay Shook Mills	[illegible]
[illegible] & Co	[illegible]
[illegible] Co	62
[illegible] Bros	[illegible]
[illegible] Co	[illegible]
Woodstock Lumber Co	62

Metal Lath

Galt Art Metal	
Metallic Roofing Co	51
Noble C. W	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co	54

Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	57
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	57
Britnell & Co	22

Pipe

Canadian Pipe Co.	58
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	58
Municipal Construction Co.	16
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co.	34
International Varnish Co.	21
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	23

Pumps and Pumping Machinery

Beatty & Sons, M.	54
Goulds Pump Co.	57
Hopkins & Co., F. H.	64
Inglis Co , John	24
Leonard & Sons, E	55
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	53
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	

Roofing Materials

Barrett Mfg. Co.	
Galt Art Metal Co.	
Metallic Roofing Co.	51
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co.	59

Railway Supplies

Factory Products Limited	
Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	58
Climax Road Machine Co.	5
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	22
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	31
Standard Drain Pipe Co.	56

Sand

Rogers Supply Co.	31

Stone

	Page
Britnell & Co.	22
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	22
Corinthian Stone Co.	54
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	53
Morrison & Co., T. A.	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	11

Submarine Driver

Rouleau, Joseph N.	61

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	52
Eastern Canada Steel Co.	15
Hamilton Iron & Steel Co.	
MacKinnon Holmes & Co.	53
Pennsylvania Steel Co.	52
Phoenix Bridge & Iron Works	53
Queen City Foundry Co.	60
Reid & Brown	60
Salter, W. H.	53

Shovels (Steam)

Beatty & Sons, M.	54
Canada Foundry Co	13
Hopkins & Co., F. H.	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Sons, E.	55

Safes and Vaults

	page
Taylor, J & J	53

Stone Cutters

Bailey-Underwood Co.	62

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co.	34

Tiles

Smith Marble & Construction Co.	

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	59
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	53

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	
Marsh & Co, Jas.	54
Standard Fitting & Valve Co	5

Ventilating System

Gardiner & Gaskill	

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	8

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	54

Water Wheels

Canadian Boving Co.	

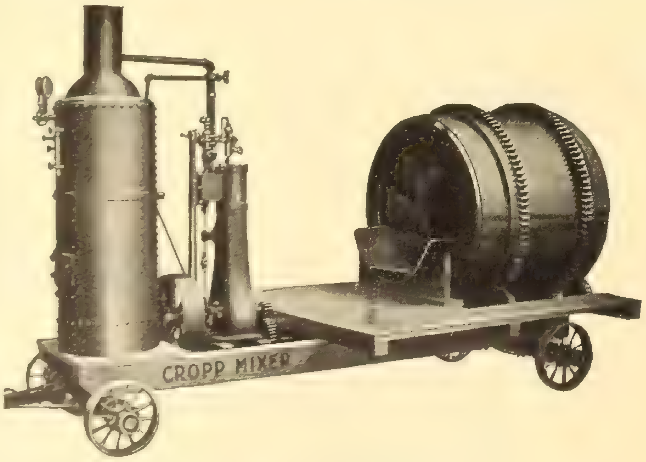
Water Power Plant

Escher Wyss & Co.	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

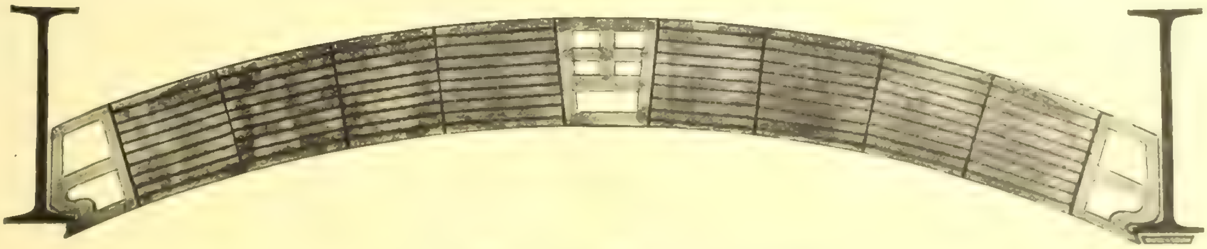
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering **Furring**
Arches **Blocks**



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick
Enamelled Brick
Vitrified Brick
Wire-Cut Brick
Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

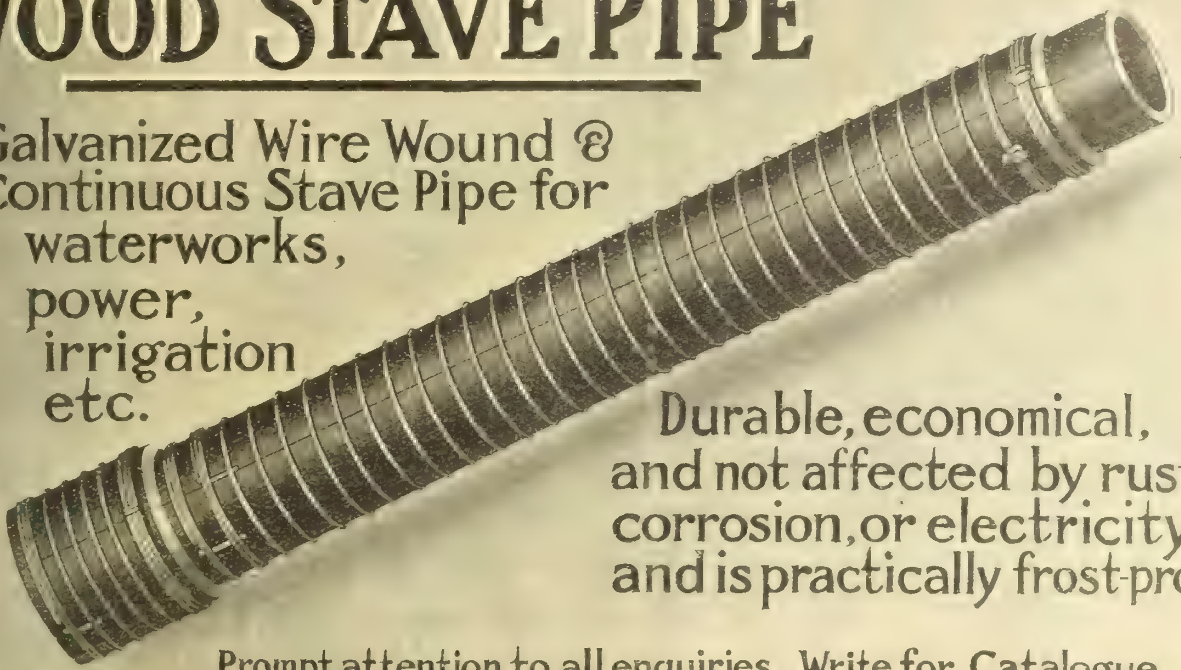
Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW, President. ROBERT W. NEW, Vice-President.

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company, Limited

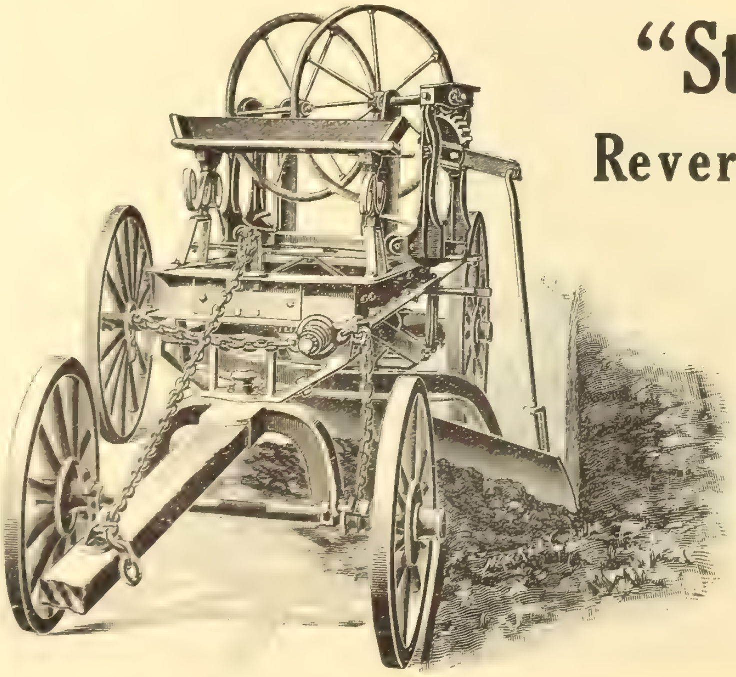
Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

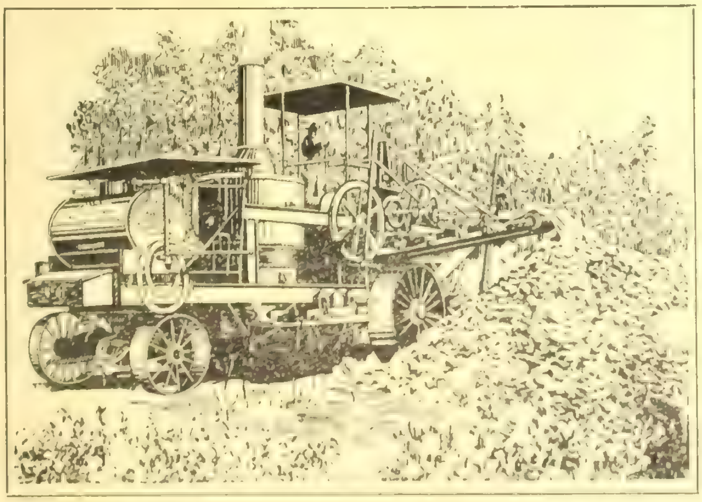
American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario
Designers and builders of road making and contractors' machinery

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Canada's Largest Reinforced Concrete Building

constructed throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS—If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS—if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

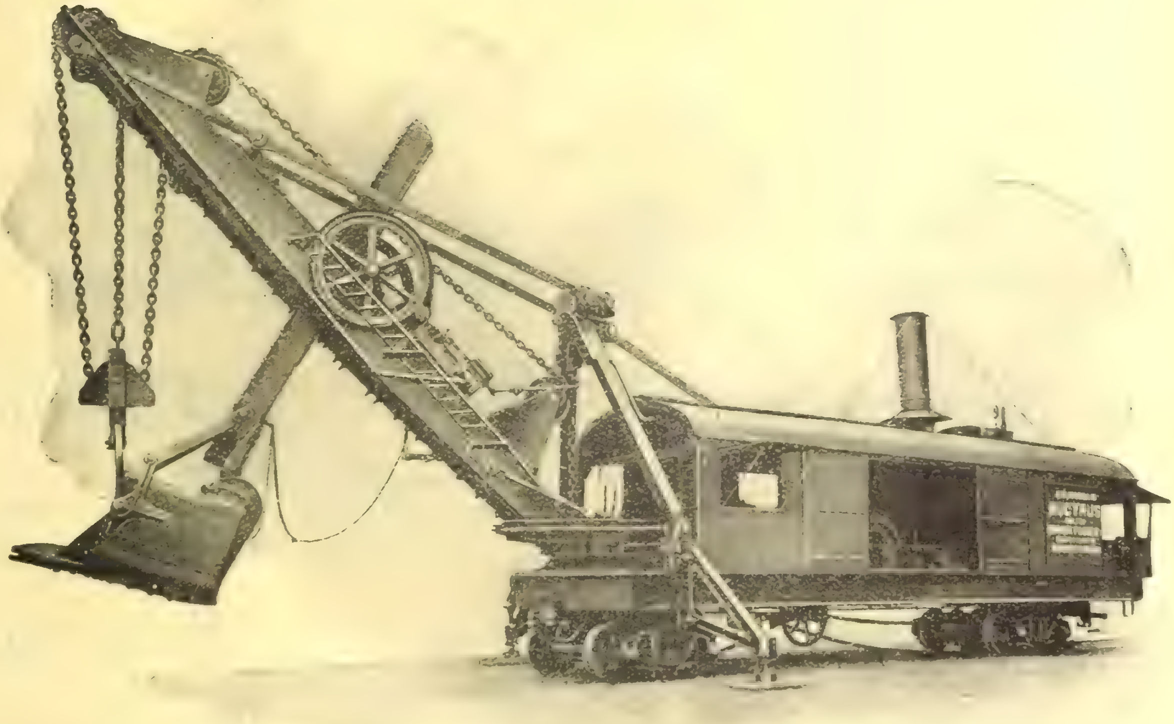
Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

Branches: Toronto, Montreal, Winnipeg, Vancouver

Canadian Bucyrus

Steam Shovels



Made in Canada

Built to withstand the severest service and to handle large quantities of material for long periods of time

Design and construction throughout of the highest class

Send for our new Bulletin No. 37

Canada Foundry Co., Limited

Head Office, TORONTO

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Do You Want Sewer Pipe

PRICES ALWAYS RIGHT

Before Winter Sets In?

We still have a large and

Complete Stock

with which to

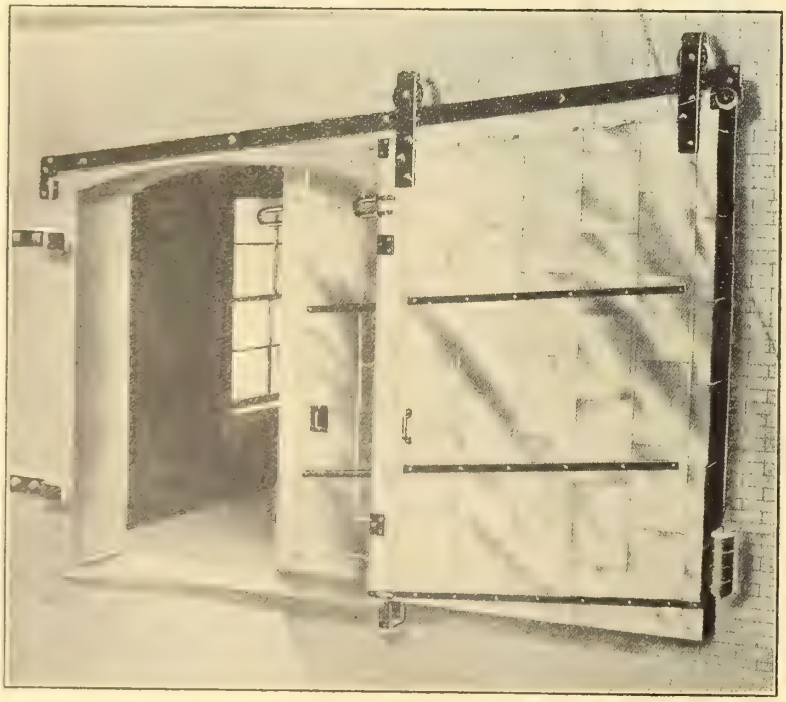
Fill Orders Promptly

and

we will pay for your telegrams if

you are in a hurry

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones:—Toronto Connection, Park 422—Evenings, Park 3888 and 3889



Specialists on Fireproof Doors and Windows

No matter how difficult your problem is, bring it to us for solution. Our apparatus has been installed in many o' the best buildings in all parts of Canada, and is doing good work everywhere. We shall be pleased to furnish estimates on this work put in complete, or on any of the parts required.

DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

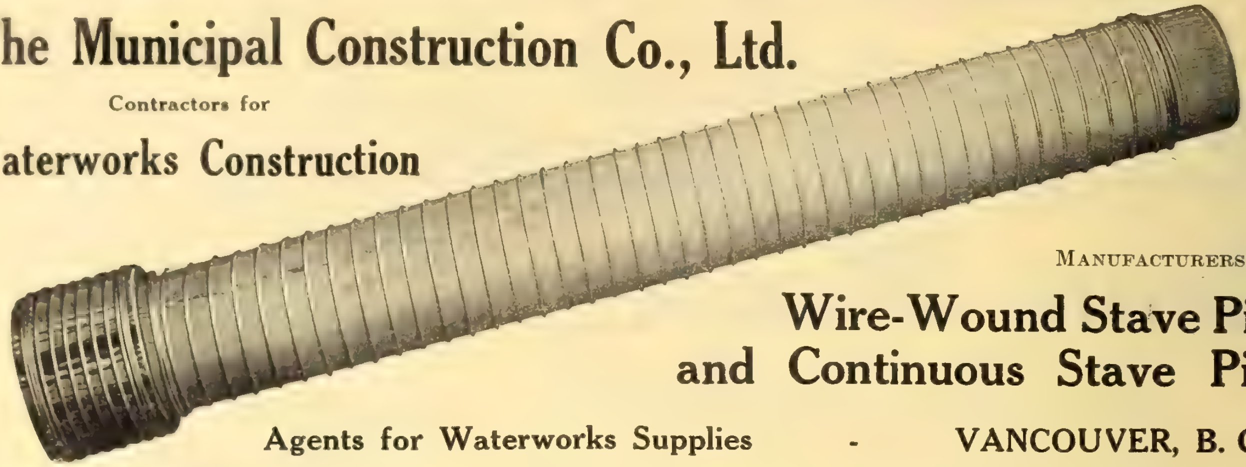
Head Office - - QUEBEC, P. Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

Contractors for

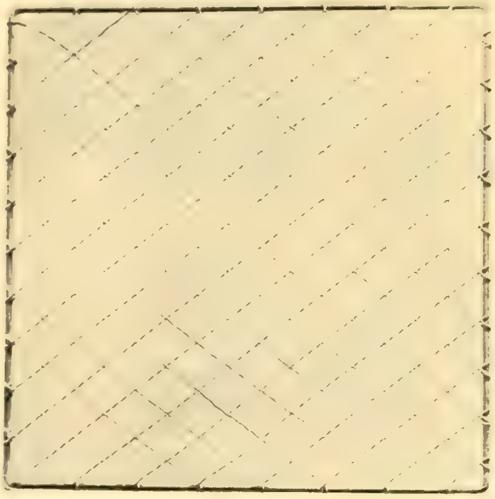
Waterworks Construction



MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

LICKLEYS, LIMITED

Mail Bldg,. TORONTO

This is a picture of our factory at Gravenhurst, which we are devoting exclusively to the manufacture of **bank, office, church, school** and **general interior fittings for houses.** We make a specialty of architects' details and can guarantee with confidence to please our customers.

Enquiries for Ontario and East should be addressed to
LICKLEYS, Limited, Mail Bldg., Toronto
For Winnipeg and District,
J. MALCOLM SUTTIE, Travellers' Bldg., Winnipeg
For British Columbia,
E. V. ALBURTY & CO., Dominion Trust Bldg., Vancouver

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

**Reinforced
Concrete
Construction**

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

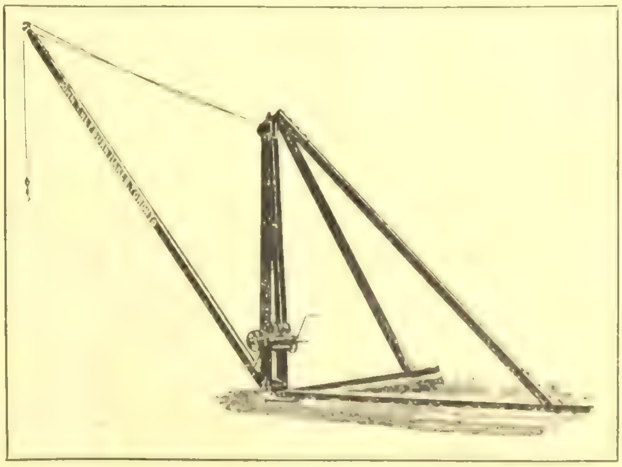
Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

No Better Derricks on the Market

Men who know the comparative value of Derricks will tell you that for all kinds of construction work there's nothing better made than

John T. Hepburn
Scotch Derricks

They are made in standard sizes ¾ ton upwards—this means that any part can be replaced at short notice. Are fitted with single and double purchase gears—changeable in a moment from one to the other—powerful band brake, and an ample length of first quality wire rope. The special safety catch locks the boom and prevents accidents. They may be operated either by hand or power.



These derricks are in use by leading contractors in all parts of the country. If you have any use for a Derrick it will pay you to investigate our line. Write to-day.

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Chance's
Flemish Glass

A new product of the famous glass works of Chance Bros. & Co., Limited, near Birmingham, England.

"Flemish" is a new and most attractive variety of Ornamental Window Glass, unsurpassed in character and brilliancy. It is particularly effective in the best kinds of Leaded Light work, and for glazing in casements, door panels or interior partitions, where the object is to obscure the vision but not the light.

"Flemish" Glass is made in large and small patterns and in White, Staining White, and numerous Tints.

Chance's Figured Rolled Glass excels in depth and brilliancy of pattern, as well as in easy cutting qualities.

Chance's Double Rolled Cathedral is brighter and more translucent than the ordinary Cathedral, while it costs no more.

To Architects and Contractors we will send on request samples of any of these lines of Chance's Glass. You will find them distinctly superior.

Agents for Canada

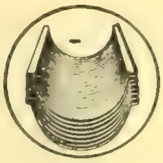
B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Read why PEDLAR NESTABLE CULVERT

saves farmers money lowers taxes—betters roads

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

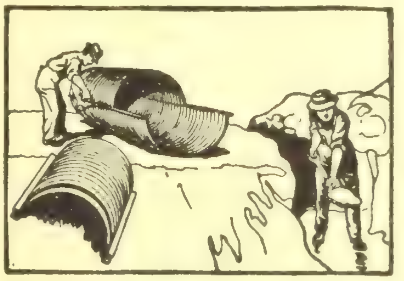
G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders—curved while cold, so the sizes never vary a fraction. These half cylinders are then corrugated by a pressure of sixty tons to the square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.

PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no make-shifts—but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. Being made in half cylinders, they are nestable—so that a great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight and carriage costs, and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the whole story clear. State your possible needs when you write for the book, and let us quote prices.

HALIFAX
16 Prince St.
ST. JOHN, N.B.
42-46 Prince William St.
QUEBEC
127 Rue du Pont
MONTREAL
321-3 Craig St.
OTTAWA
423 Sussex St.
TORONTO
111-113 Bay St.
LONDON
86 King St
CHATHAM
200 King St. W.
PORT ARTHUR
45 Cumberland St.
WINNIPEG
76 Lombard St.
REGINA
1901 Railway St. South
CALGARY
1112 First St. W.
VANCOUVER
821 Powell St.
VICTORIA
434 Kingston St.

ADDRESS OUR NEAREST WAREHOUSE.
WE WANT AGENTS IN SOME LOCALITIES
WRITE FOR DETAILS.
MENTION THIS PAPER.

Send Now For Free Book

BOOKLET NO. 23

And Sample Culvert

Address Nearest Warehouse of

THE PEDLAR PEOPLE
OF OSHAWA, - - CANADA

(Largest Sheet Metal Manufactory in the British Empire)

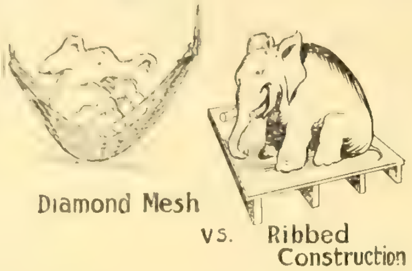
The Pedlar People of Oshawa
Ontario, Canada

include in the output of their immense factory the below-mentioned specialties in sheet metal building material. Samples, descriptions and prices of any of these will be readily forwarded postpaid and free upon request addressed to the Pedlar warehouse nearest to the inquirer.

Pedlar Nestable Culvert, Oshawa Steel Shingles, Steel Roofing, Corrugated Iron, Metal Shutters, Skylights, Conductor Pipes, Finials, Art Steel Ceilings, Art Steel Siding, Eave Troughs, Prepared Roofing, Metal Doors, Metal Lath, Ventilators, etc.

Why we have had to double the Herringbone Manufacturing Facilities

Because Herringbone is the most Rigid Metal Lath!



The Herringbone ribs act as miniture joists. They stiffen the lath so that it will span sixteen inches. They act as baffles throwing excess plaster back on the trowel.

They hold the wet clinch and cause it to seal in the strands instead of slipping off.

Baggy lath takes much more plaster than stiff lath.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. **Phone Main 5912** **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

ZINC ORNAMENTS

An extensive range to select from. Special designs made to order on short notice

Every little while we make new additions to our already extensive range of zinc ornaments. This class of work is a specialty with us and we have originated many exceptionally handsome ornaments for use in connection with outside cornices, pilasters, capitals, pediments and other purposes. We have unsurpassed facilities for doing special work on short notice. When figuring on a contract calling for zinc ornaments it will pay you to consult us for suggestions.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Montreal, P.Q. **PRESTON, ONTARIO**

All International Varnish Products are Sold in full Imperial Measure Cans

That means more satisfaction and better goods for your customers at the same money. Their satisfaction means trade insurance—A permanent clientele for you.

Many prominent architects are kind enough to say that all International Products are hall-marked "Superior Quality."

Be that as it may, when you specify International Products your reputation is protected as far as the ingenuity and experience of any manufacturing concern can protect.

Secure our new album of Superior Finishes and judge for yourself.

Specify the following International Products in the contract:

Elastica Floor Finish	**Satinette** "The Enamel that stays white"	**Kleartone Stains**	**Flattine Finishes**

Full Imperial Measure is used in all Packages

Made by

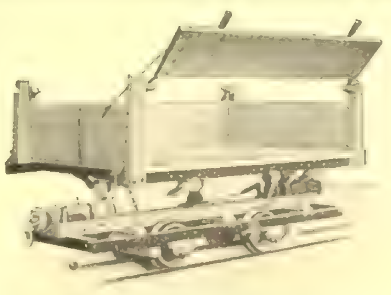
International Varnish Co., Limited

TORONTO WINNIPEG

The

Meaford Wheelbarrow Co. Limited

MEAFORD, ONTARIO



Manufacturers of Contractors' Supplies, etc.

WHEEL SCRAPERS—Pressed Bowl and Square Box.

DRAG SCRAPERS—Pressed Steel, Handles on top or sides, with or without runners.

DUMP CARS—GRADING PLOUGHS.

STERLING line of Roller Bearing, Easy Pushing Wheelbarrows and Concrete Carts.

WHEELBARROWS of every description, both in steel and wood.

TIMBER DOLLIES, TRUCKS of all kinds.

ASK FOR OUR CATALOGUE

SELLING AGENTS:
Alexander Gibb, 13 St. John Street, Montreal.
Bissett & Loucks, Ltd., 151 Notre Ave. E. Winnipeg, Man.
John Burns, 313 Water Street, Vancouver.

Everything for the Builder

Sand and Gravel Screened, Pit Run and Pea Gravel Building Sand

We can also ship promptly, Building and Crushed Stone, Lime, Cement, Fire Clay, Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile.

LET US FIGURE WITH YOU.

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto **Tel. M. 6859**

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.

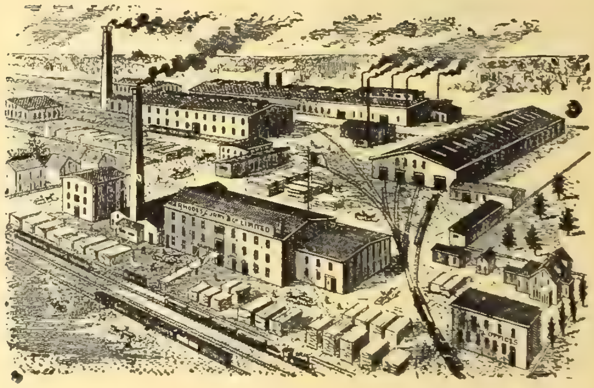
Limited

9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material.

Rhodes, Curry Co., Limited

Lessees



Bank and Office Fittings

SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. **Amherst, N.S.**

BRANCHES AT

Halifax Sydney

WE MANUFACTURE

HOUSE TRIM Pine and Hardwood

Special attention given to

Chestnut Trim

Estimates promptly given for quick and good work

The Tillson Co., Limited

Tillsonburg, Ont.

We give special attention to the manufacture of

Penstocks

and other Rivetted Pipe

First-class workmanship and prompt delivery guaranteed

International Marine & Signal Co.

Limited

OTTAWA - CANADA

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

For

Fire and Furnace Purposes

there are no better bricks than

GLENBOIG or GARTCOSH

Brands

For Building Purposes

where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb, 13 St. John St.
Montreal

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors plant

Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

London Automatic Batch Concrete Mixers

Made in two sizes

No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money
On the first cost of machine
On cost of operation
On cost of mixing concrete

Our Automatic Mixers do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired

We also manufacture a Standard Drum Batch Mixer in four sizes, 7 ft., 10 ft. 20 ft. and 30 ft. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.,
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

Mixed Cars

We make a specialty of mixed cars of builders' material.

SASH, DOORS (pine or veneered hardwood), **MOULDINGS, CEILINGS, FRAMES, EMPIRE BRAND HARDWOOD FLOORING, STAIRS,** etc.

These materials are strictly high grade and will give a FINISH to house that is sure to please even the most critical.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent
[illegible]

Heavy Plate Work

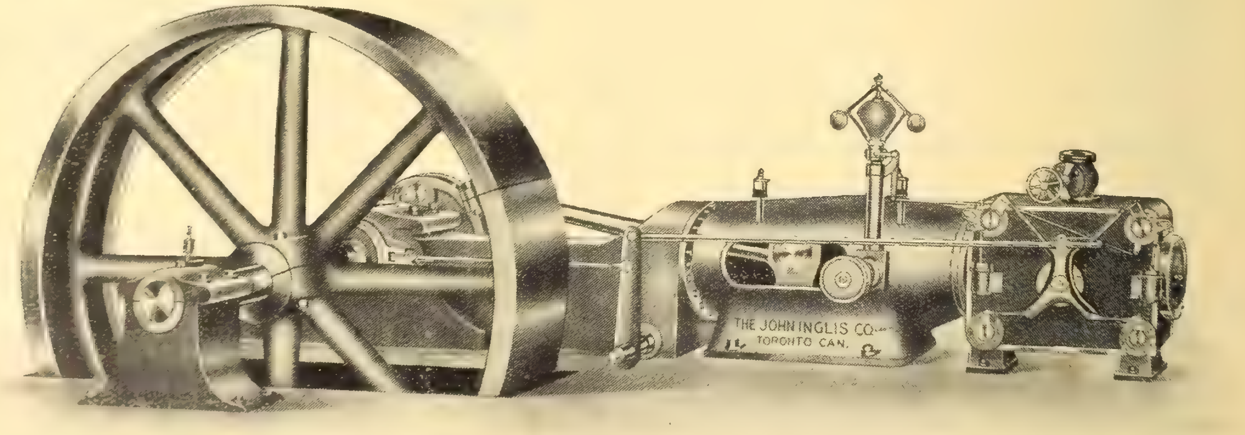
We Manufacture and Erect:

- Stand Pipes
- Penstocks
- Water Tanks
- Dryers
- Fertilizers

100,000 Gallon Water Tank,
built and erected by us for the Michigan Central Railway at Waterford, Ont.

- Blast Furnaces
- Flumes
- Smoke Stacks
- Special Machinery
- Plate Work of all kinds

"INGLIS" Corliss Engines built for a purpose, to last a life time


THE JOHN INGLIS CO.
TORONTO CAN.

Every Engine guaranteed to do just as represented.
Write us for particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Chatham, Ont.
Tenders for excavation of the Sinn Cooper Drain Raleigh will be received until Nov. 21st. P. R. Clark and S. S. Gilhulah, commissioners.

Coquitlam, B.C.
The clerk has been instructed to write to New Westminster city council regarding the laying of the new water pipes along the roads in Coquitlam.

Eastview, Ont.
A petition will be presented to the Eastview village council at its next meeting asking that drain be built along Montreal road, which would empty into the Ottawa trunk sewer.

Gleichen, Alta.
A new system of waterworks is being planned by R. B. Owens, provincial engineer.

Montreal, Que.
Waterworks Superintendent Janin in his report on the cost of filters estimates the cost as $2,000,000, of which $1,680,000 is for the filtration system, the rest for land. Further expenditure in the near future to make the water supply adequate for the growing needs would amount to about $2,300,000.

Oshawa, Ont.
The town has purchased a sewage farm near here.

Rosemount, Que.
The Board of Control will be asked to provide for the laying of new pavements, of new concrete sidewalks, and fire service.

Sault au Recollect, Que.
The ratepayers will vote on an $80,000 by-law for a municipal water system, etc.

South Vancouver, B.C.
The council resolved at its meeting to ask the city of Vancouver to join with them in engaging the services of an engineer to take up the special work of planning a sewerage system covering both districts.

St. Stephen, N.B.
Until Nov. 30 tenders will be received for $25,000 36 year, 4 per cent. waterworks debeneures. J. T. Whitlock, chairman finance committee; J. Vroom, town clerk.

Trail, B.C.
Until Nov. 21st tenders will be received for $15,000 6 per cent., 20 year waterworks debentures. W. E. B. Monypenny, city clerk.

Toronto, Ont.
The city engineer will allow a trial of 3 inch asphalt blocks instead of 4 inch in paving down town business streets.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until Nov. 22nd for 1 10-ton hand operated travelling crane at high level pumping station and one 15-ton hand operated travelling crane at main pumping station.

A by-law will be submitted to the ratepayers next January to raise $100,000 for the improvement of roads leading into Toronto. $100,000 has been appropriated by both the County of York and the Ontario Government for a similar purpose.

St. John, N.B.
At a special meeting of the board of works, it was decided to recommend to the council that the work of the Hassam Company in Main and Water streets be taken over. The engineer's certificates were before the members. The entire cost of the Main street contract was set down at $18,266.23 and of the work in Water street at $7,549.20.

Victoria, B.C.
The advisability of the extension of View street through to Government street now made possible by the recent fire, is being discussed.

The bylaw for the expropriation of the holdings of the Esquimault Waterworks Company will in all probability be submitted to the ratepayers December 1. A. Smith, city engineer.

Wolseley, Sask.
The ratepayers will in the near future vote on a by-law to issue $24,000, 5 per cent. road debentures.

Weston, Ont.
The pumping machinery for the mechanical pressure filter here will probably be placed in service about the first of the year. The American Water Softener Company is supplying the filters. The same company has supplied the T. H. & B. Railway with a water softening plant at Smithville, Ont., to be used in connection with the purification of locomotive water. A. C. Tomlinson, treasurer.

Winnipeg, Man.
The city council adopted the following: It being agreed that for the present the artesian water supply, with its possibilities of extension, is quite adequate, it was decided to obtain full information in regard to a satisfactory water softening plant. In view of the possibilities in the future, it was decided to have an exhaustive and adequate survey made of the possible sources of a permanent visible supply of water from the Winnipeg river, in order that the city may have all necessary information in readiness. Thirdly, it was deemed that this is not an opportune moment for asking the people to vote on an expenditure of some millions for the immediate installation of a permanent, visible water supply plant.

AWARDED.

Chatham, Ont.
The Warren Paving Company will construct the bitulithic pavement on Queen street for $[illegible] per square yard and [illegible] cents for concrete curb and gutter.

New Westminster, B.C.
The Hassam Paving Co. received the contract for paving Third street, $[illegible] being considerably lower than the next lowest tender.

Toronto, Ont.
The contract for laying the asphalt block on College street between Dovercourt road and Lansdowne avenue at $40,720. Four tenders ranging from $42,412 to $48,811 were received.

Victoria, B.C.
The Worswick Paving Company will lay the asphalt on portions of Fernwood road, Rockland and Richardson streets. Completion called for by January 1st.

The tenders for waterworks supplies were received as follows and awarded: Brass goods, Miller Limited, London, $12,636 (accepted); Andrew Sheret, $14,338; Robert Mitchell Company, $15,261; Crane Company, $1,486; E. G. Prior & Company, pany, $15,826.25; Canadian Fairbanks Company, $16,008; Galvanized iron pipe, A. Sheret, $1,483.83 (accepted); Findlay, Durham & Brodie, $1,486; Canadian Fairbanks Company, $1,486; E. G. Prior ⅞ Company, $1,497; A. J. Forsyth & Company, $1,740; Galvanized fittings, A. Sheret, $1,931.02 (accepted); Canadian Fairbanks Company, $1,974.54; Findlay, Durham & Brodie, $2,470; Lead pipe per 100 pounds, A. Sheret, $4.10 (accepted); E. G. Prior & Company, $4.19; Findlay, Durham & Brodie, $4.48¾; A. J. Forsythe & Company, $4.97½.

Walkerville, Ont.
The Windermere road sewer will be put in by Thos. Chick, Windsor. Engineer, O. McKay, Walkerville.

Railroads, Bridges and Wharves

Fredericton, N.B.
The C. P. R. management have under consideration extensive additions and improvements to their yards here.

Chapel Cove, N.S.
Tenders are called until December 5th for construction of breakwater here by Public Works Department. R. C. Desrochers, secretary.

Montreal, Que.
Plans laid before the Metropolitan Parks Commission by Sir William Van Horne and Controller Wanklyn for increase of local transit facilities are as follows: A four-track subway under St. James street from the east side of the City Hall to a point to the west of the [illegible] and this subway to carry the through car service now using Craig, St. James and Notre Dame streets. [illegible] tunnel under Cote des Neiges Hill connecting the rapidly-growing residential district beyond the mountain with the west, and centre of the city; it was estimated that this could be done for a million dollars. The Commissioners will give the proposals the earliest [illegible]

Owen Sound, Ont.
Town Engineer [illegible] to prepare [illegible] estimates for a new bridge to replace the Tenth street bridge.

Ottawa, Ont.

City Engineer Ker has been given authority to recommend an expert engineer to act in connection with him in consideration of plans of entrance into Ottawa and general question of railway entrances into this city. The Government will have the appointment of another engineer to act with the city engineer and his nominee.

In regard to the high level bridge over the Rideau canal at Bank street, for which the deputation waited upon Hon. G. P. Graham, Minister of Railways, the estimates of bridge by Mr. Bowden, chief engineer of the Department of Railways and Canals, were $165,000; that of City Engineer Ker, $125,000. It is stated that in all probability estimates for the construction will be passed by Parliament at next session.

Red Deer, Alta.

The Alberta Central Railway Company has given notice of application to Parliament for power to construct, operate, etc., a line of railway in common, or as may be defined by the proposed act, from Saskatoon, easterly to Hudson Bay, with terminals at both Fort Churchill and Fort Nelson. The Alberta Central Railway Company has now under construction a line of railway seventy miles westerly from Red Deer, and forty miles easterly towards Moose Jaw. Solicitors, Smith & Johnston.

St. Joseph de Letellier, Que.

Tenders are being called until December 6th for construction of wharf by Public Works Department, Ottawa. R. C. Desrochers, secretary.

Stratford, Que.

Tenders are called until December 5th for construction of Landing Pier here by Public Works Department. R. C. Desrochers, secretary.

St. Thomas, Ont.

The G.T.R. purpose extending their yards which has necessitated their refusal to the request of the city for the opening of Inkerman street.

Toronto, Ont.

It has been decided to incorporate inone by-law the two schemes for the viaducts, instead of submitting the two by-laws on January 1. The combined schemes will cost approximately $1,000,000.

It is reported that the entire south side of Macpherson Ave., from Poplar Pains Rr. to Avenue Rd., purchased two weeks ago ostensibly for the purpose of establishing a packing factory, has been transferred to the C. N. R. This will serve as a connection with their Electrical Development Company right of way with their Ottawa line.

Victoria, B.C.

At the coming general civic elections it is a foregone conclusion that a money by-law will be submitted covering the cost of an overhead viaduct affording an avenue of communication between Granville street and Westminster avenue at a point south of Pender street. The estimates for various proposed locations vary from $281,000 to $350,000.

The report of the city engineer, Angus Smith and A. M. Bannerman, chairman Streets Committee, for the construction of another public wharf on Dallas road in conjunction with the Victoria Chemical Company, was adopted by the committee.

The following were named on the committee to consider plans for the new bridge across the harbor connecting Johnson street with the Indian Reserve. Mayor Morley, Ald. Bannerman, Mable and Sargison, J. S. H. Batson, A. E. Todd, George McCandless and T. C. Sorby.

AWARDED.

Lindsay, Ont.

The contract for C. P. R. section commencing near Cambray and extending west of Lorneville has been awarded by the Toronto Construction Company to Johnston Bros., that for section between Cambray and Lindsay to Perry & Stewart.

Winnipeg, Man .

Wm. Newman & Company were awarded contract for new bridge on C. P. R. Pheasant Hills branch.

Public Buildings, Churches, Schools, etc.

Bellevue, Alta.

The Methodist Mission Board have decided to erect a church in the Crow's Nest Pass.

Battleford, Sask.

The ratepayers voted for building a $25,000 municipal building.

Bassano, Alta.

The contract for erection of a school is to be let by the school trustees. They have been authorized by the provincial board of education to raise $15,000 to erect a first class school.

Brandon, Man.

City Engineer Speakman is preparing plans for the installation of a steam heating system in the city hall and opera house. It is planned to use the steam from the Brandon Electric Light Company's plant.

Creston, B.C.

The Anglican Church here will erect a new church. Mr. J. W. Dow is interested.

Calgary, Alta.

Messrs. Hodgson, Bates & Butler are the architects in charge of the erection of the 8-room school mentioned in last issue.

Messrs. Lang & Dowler are the architects in charge of the erection of the 12-roomed school mentioned in last issue.

Carleton Place, Ont.

Mayor Cram and Reeve Pattee of Carleton Place waited on the minister of militia in Ottawa, asking that the site on which the former drill shed in Carleton Place stood be exchanged with the town for another site. If granted the old site will be converted into a park. The minister of militia said that the government may build an armory instead of a drill hall in Carleton Place.

Earl Grey, Sask.

$35,000 will be expended for new town hall.

Edmonton, Alta.

The Methodists are to have an Austrian mission church erected.

J. A. Ruddick, Dominion Dairy Commissioner, wants the provincial government to subsidize a cold storage plant to be erected here.

Fort William, Ont.

Tenders were called until November 16 for installation of heating plant for central fire hall. H. S. Hancock, city engineer.

Grand Falls, N.B.

Tenders are being called until November 30th by the Public Works Department, Ottawa, for erection of public building here. R. C. Desrochers, secretary.

Grand Forks, B.C.

Tenders will be called for school house when Architect Lawrence, of the Public Works Department, Victoria, has prepared the plans.

Hamilton, Ont.

The congregation of Chalmers' Church, Mt. Hamilton, will erect in the spring the proposed addition.

Hull, Que.

The city council of Hull has been considering the advisability of erecting a new hospital to cost $35,000. The council is agreed about the construction, but the site has not yet been decided on. It will come up for final action at the next meeting.

Hamilton, Ont.

The members of the county council have taken first steps towards establishing a county House of Refuge, as required by an Ontario statute. It was decided that the council purchase the John McNiven farm, near Ancaster, consisting of 72 acres. It was also decided to have plans prepared for an institution costing not more than $30,000.

Kindersley, Sask.

Tenders are being taken by H. C. Hutchinson for erection of Anglican church.

London, Ont.

The police station has been condemned as unsanitary by Dr. T. V. Hutchinson, M.H.O.

Mr. John M. Moore, architect, is preparing plans for the remodelling of the police station.

The movement to erect new Masonic Temple gains headway, the stock being taken up readily. C. W. McGuire, president. Noted in issue of October 12th.

Melville, Sask.

The town is to have a municipal hockey, curling and skating rink.

Medicine Hat, Alta.

W. T. William, architect, is completing plans for a new school building.

Montreal, Que.

Seventeen tenders were received for tracts of land to be used as an exhibition ground. These were referred to a special committee. Ald. L. A. Lapointe is interested.

The Board of Control have recommended that $40,000 be spent in rebuilding the smallpox hospital situated on Moreau St.

Nelson, B.C.

Tenders are being called until November 28th for additions and alterations to the public building here by the Public Works Department, Ottawa. R. C. Desrochers, secretary.

Nanaimo, B.C.

Tenders are being called until November 28th for additions and alterations to the public building here by the Public Works Department, Ottawa. R. C. Desrochers, secretary.

Ottawa, Ont.

The building committee have decided to call for tenders for the building of an addition to the Detention Home. H. A. Hazelgrove, architect.

The Children's Aid Society of Ottawa will ask the Provincial Government to build a hospital for weak-minded children in eastern Ontario.

The directors of the Central Canada Exhibition Association have appointed a committee to prepare a plan for the drives and location of new buildings in the grounds. The machinery and carriage buildings are unsafe to be used again and the horticultural hall is in need of repairs.

Portage la Prairie, Man.
Plans for the new Indian school are under way.

Port Arthur, Ont.
Judge O'Leary condemns the court house here severely.

Phoenix, B.C.
Tenders addressed to T. A. Love, secretary, school board, will be received until November 26th for the erection of a four-room school here. Plans, etc., at city hall, Phoenix; at offices of the Superintendent of Education, Victoria.

Quebec, Que.
It is stated that new permanent immigration buildings and sheds are contemplated to replace the ones in use now. W. D. Scott, superintendent of immigration. Hon. Frank Oliver, Minister of the Interior, will bring the matter up in Parliament.

Rosetown, Sask.
A 4-room brick school to cost $14,000, will be erected.

Regina, Sask.
A delegation composed of J. A. Allan, W. E. Mason, J. H. D. Stevens and R. B. Ferguson, waited upon city council with a request for financial support in the project to erect a suitable home for the Young Women's Christian Association.

Stratford, Ont.
On January 2nd the ratepayers will vote on the expenditure of $15,000 for a market building, the site to be selected by the ratepayers.

It has been found necessary to secure options on suitable sites in the north ward for the erection of a new ward school next year.

Saskatoon, Sask.
L. M. Wilson is erecting a $12,000 rink here.

The Third avenue Church have under consideration the erection of a new church. Estimated expenditure, $100,000.

Sault Ste. Marie, Ont.
The Soo skating rink was totally destroyed by fire on the 9th inst., and several buildings in the vicinity burned. The total loss will be $30,000. It is stated the rink will not be rebuilt this year.

Toronto, Ont.
The council have selected sites on Claremont street, Birch avenue and Markham streets for police stations, and adopted the report from the property committee for an expropriation of a site on Greenwood avenue.

Plans are being prepared for the new clubhouse for the Hunt Club to replace the one recently destroyed by fire. Estimated cost, $100,000. Architects, Darling & Pearson. Building committee includes Messrs. Edmund Bristol, A. O. Beardmore, Hume Blake, R. W. Christie, Gordon Osler and George Beardmore.

The Board of Education have authorized the purchase of the Gandier property adjoining the school for the purpose of enlargement of the Parkdale public school.

City Architect McCallum has issued the permit for the administration building of the Toronto General Hospital. It is a 4-storey structure, facing on College street, and will cost $300,000.

The Board of Control has authorized Mr. W. Randolph Sweany, business manager Toronto Hydro-Electric Department, to take full charge of the wiring of the buildings at Exhibition Park.

The executive of the Ontario Club has decided to buy the Standard Bank Building. Messrs. Sproatt & Rolph have been appointed the architects to remodel the whole interior, which consists of five floors and a basement, the dimensions of which are 60 by 80 feet. $100,000 will be spent.

Vancouver, B.C.
The old City Hospital, the present home for aged men, has been condemned as unsanitary, and the health committee is seeking a suitable site for erection of new buildings. Dr. Underhill, M.H.O.

At the next meeting of the health committee it is stated tenders for new isolation hospital on Admiralty reserve will be considered. Architect Dalton.

At the meeting of the South African campaigners in the drill hall it was announced that a new armory would be erected here. Mr. J. W. Warden is interested.

Victoria, B.C.
The ratepayers will probably be asked shortly to authorize the expenditure of about $50,000 on improvements to the fire department. Of this, $12,000 will be spent on halls at Oaklands and Fairfield, the rest on equipment.

Walkerville, Ont.
It is stated that plans are being prepared by Burrowes & Wells, Trussed Concrete Building, Detroit, Mich., for a two-storey, 45 x 60-foot custom house which is to be erected by the Canadian government.

Wynyard, Sask.
The new skating and curling rink will be started at once, to cost $10,000.

Winnipeg, Man.
The following by-laws will be voted upon at the coming December election: General hospital, $400,000; municipal hospital, $400,000; two suburban police stations, $60,000; and others, bringing the total up to $1,635,000.

The Methodist Mission Board have granted $6,000 for erection of a kindergarten institute with the condition that the city raise $6,000 more.

A new school will be built at Sturgeon Creek by the municipality of Assiniboia.

It is officially announced that the new Agricultural College will be built in St. Vital.

Plans for a new court house, four storeys, have been approved. Tenders will not be called for some time yet.

Tenders addressed to the chairman of the Board of Control will be received until November 30th for supply of labor and materials required for the erection of public baths in Selkirk Park. Plans, etc., at office of the architect, Wm. Bruce, 222 McDermott avenue. M. Peterson, secretary.

The Winnipeg Amateur Athletic Association have secured fifteen acres from Main street to the river. The large brick building on the grounds will be altered, and a grand stand erected in the spring.

AWARDED.

Bassano, Alta.
Wm. Hood secured the contract for erection of a fire hall.

Crossfield, Alta.
Geo. Becker secured contract to erect brick school here on a bid of $13,900.

Dubuc, Sask.
Snider & Sutherland, Regina, were awarded contract to erect solid brick school. Storey & Van Egmond, architects.

Hanover, Ont.
We are informed that the contract for the erection of town hall and public library has been let to J. L. Youngs, Stratford, $20,400. Architects, Forster & Clark, Owen Sound town hall); W. E. Bunning, Listowel.

Kindersley, Sask.
The contract for the material for the new Methodist church has been let to the Colwell Lumber Company and the work has been awarded to Contractor Mackenzie.

Moose Jaw, Sask.
Brown Bros. secured contract to build new Methodist church, 32 x 60 feet.

Next year will see an addition to the post office, the building of the armory, and the mammoth works of Gordon & Ironsides, built.

New Westminster, B.C.
The contract for construction of fire hall was given to Sloan & Harrison for $2,500.

Ottawa, Ont.
The council gave the contract for supplying electrical fixtures for the city hall to the Ottawa Electric Company. Noted in last issue.

W. F. Vilas, of Cowansville, Que., was awarded the contract for the desks for the new public schools as his was the lowest tender.

Plunkett, Sask.
G. E. Delgarus was awarded contract for new school building.

South Vancouver, B.C.
The contract for addition to Mountain View school has been awarded to Harrison & Hall, $1,645.

Strathcona, Alta.
The contract for the $75,000 post office building in this city has been awarded to Wm. Garson, Calgary. The structure will be a handsome one of pressed brick and stone, two storeys high with a clock tower.

Wainwright, Alta.
John Berry secured the contract to erect the new Presbyterian church. Stimpson & Cook, architects.

Residences

Montreal, Que.
A company, to be known as the Garden City Company of Canada, has been organized and it is stated a charter will be applied for. The purpose of the company is to purchase a large tract of land close to the city and erect thereon model dwellings as soon as plans are prepared. Capital stated to be $1,000,000. President, Lt.-Col. J. H. Burland; solicitor, C. H. Holt, K.C.

North Battlefaid, Sask.
[illegible] erected.

Nelson, B.C.
[illegible] residence at once.

Ottawa, Ont.
[illegible] plans for a residence for C. K. Graham on [illegible] stucco.

[illegible] on the corner of Bank and Carling avenue.

Toronto, Ont.
Mr. T. A. McTaggart, the purchaser of the corner of Sherbourne street and Wil[illegible]

Wainwright, Alta.
N. J. [illegible] will build at once a $5,000 [illegible].

Winnipeg, Man.
[illegible] has plans under way for another apartment block on River avenue. [illegible] [illegible], six storeys. Excavation starts at once.

The following have purchased sites and contemplate building: G. W. Markle, jeweler; V. Fischer, of Grain Exchange; A. [illegible], of Dominion Bank; Rev. S. G. Bland, Dr. Gordon Bell, W. Martin, president Gypsum Company; Prof. W. A. McIntyre, Dr. J. E. Jones, U. S. consul; T. D. J. Farmer, H. T. Swart.

R. H. Kelly is to erect eight more cottages on Merrion street.

AWARDED.

Brandon, Man.
The contract for construction work on the cottages to be erected for the Home Building Company, which includes N. J. Matthews, barrister, and G. W. Jones, of the Empire Securities Company, both of Winnipeg, has been awarded to H. G. Fletcher of this city.

Cardston, Alta.
H. D. Folsom has contract to erect residence for Mayor J. T. Brown.

Medicine Hat, Alta.
Geo. Worthy has the contract to build a new parsonage for the Century Methodist Church.

Montreal, Que.
Mr. J. Seath Smith, architect, 207 St. James street, has awarded the general contract for the erection of two residences on Sherbrooke street west, to J. C. Hague, contractor, Montreal.

Business Buildings and Industrial Plants

Battleford, Sask.
A. E. Brown has plans prepared for hotel building for Mr. Angle.

Beauport, Que.
The citizens, it is stated, have approved of the by-law providing for the erection of a factory here for the Canadian Cotton & Silk Manufacturing Company.

Carstairs, Alta.
A new hotel will be built by T. E. Driscoll.

Calgary, Alta.
T. J. Skinner will erect a 7 storey building.

H. Haskins is to have a $13,000 store erected, with apartments above.

Churchbridge, Sask.
E. E. Lewarton is to erect a store at Buffalo Valley. J. W. Vernon will aslo build a large block at the latter place at once.

Hamilton, Ont.
J. M. Lyle, architect, Toronto, is calling for tenders for new bank building to be erected at 39 James street south.

The Standard Sanitary Company, which located its Canadian branch in Toronto some time ago, has decided to build a big warehouse here.

Lethbridge, Alta.
Concrete work is under way on T. S. MacKenzie's new $20,000 warehouse. W. R. Virtue has the general contract.

London, Ont.
Plans for a new warehouse, 85 x 48 feet, 2 storey and basement, have been prepared by J. M. Moore for the Queen City Oil Company. Tenders will be called for shortly. Estimated cost of building, about $50,000. C. W. McQuire, local manager.

Lethbridge, Alta.
F. Sisk, manager of the Lethbridge Brewing & Malting Company, states that another huge addition to the brewery will be constructed early next year, to consist of five storeys, cost $150,000.

Lindsay, Ont.
Work will commence at once on the factory for the Thomas Shoe Company, with factory in Cleveland, Ohio. D. E. Thomas, representative.

Melville, Sask.
The Imperial Oil Company will build a warehouse here.

Medicine Hat, Alta.
Plans are being made for a large addition to the Cosmopolitan hotel. W. T. Williams, architect.

Montreal, Que.
The C.N.R. have purchased the building on St. James street adjoining the old Sovereign Bank building, which will be used as headquarters for the railroad, steamship and other interests of this province. Extensive alterations will be made.

Negotiations are under way for a suitable site for the Southbridge Spectacle Company of South Bridge, Mass.

The Pringle factory in St. Henri Ward has been purchased by the Walter Baker Company, Limited, of New York and Boston, on which, it is reported, an extension will be made.

The Boxer estate, which owns the condemned building on the west side of St. Francois Xavier and St. James Sts., have announced to the Board of Control their intention to pull the whole structure down and put up on the site one of the finest office buildings in the city. The work of demolition will be started without delay.

The Steel & Radiation, Limited, Toronto, have purchased a site on the banks of the Lachine canal here, where they intend to erect a large foundry plant. It is expected that construction will be begun as soon as possible. Sir Henry M. Pellatt, president.

New Westminster, B.C.
A. R. Snelgrove will erect at Columbia and Hegbie streets, a 6 storey store and office building.

Nelson, B.C.
The Taylor Milling Company, of Calgary, Alta., have purchased four lots on Vernon street, upon which, it is stated, they intend to erect a business block.

Outlook, Sask.
A $15,000 building is under way for the Canadian Bank of Commerce.

Ottawa, Ont.
J. E. Cox has written the board of health that he is preparing to build a $50.000 building on Nelson street, to be completed early next year.

A building permit has been issued to the Slinn-Shouldis Company, Limited, for a new bakeshop and stables on Catherine street; also to the Ogilvie Milling Company for a new office and warehouse on Botellier street, $9,500.

Prince Albert, Sask.
W. W. Lock, of Minneapolis, has purchased 75 feet on Central street. It is stated a 5 storey block will be built on it in the spring.

Penticton, B. C.
It is stated that W. H. Tapley has secured a site for a cement factory on the water front. It is said that the clay cliff in he vicinity will afford the best material for mixing with the cement in the manufacture of concrete.

Port Hope, Ont.
The agreement between the town and the International Tool Steel Company, it is stated, has been satisfactorily drawn up. It is expected that work on the new building will be started shortly. Mr. Chapman, secretary-treasurer.

Quebec, Que.
See "Power Plants."

Sydney, N.S.
Mr. Davies, representative of steel works at Newcastle, England, will come here with a view to locate a steel industry.

St. John, N.B.
It is stated that Jos. A. Likely has secured option on a block of land on the Marsh creek on which he intends to erect a sawmill and lumber pond. Estimated expenditure, about $45,000.

Sunnyslope, Alta.
H. F. Pieper has started erection of a large store building.

Smith's Falls, Ont.
We are informed that negotiations regarding the location of the Canadian Cooperage, Limited, in Smith's Falls are still open, the question of supply of raw material available being a consideration.

Sherbrooke, Que.
The Guelph Carpet Company, of Guelph, Ont., has purchased the plant of the Montreal Carpet Company here and will enlarge it.

Spanish River, Ont.
A reorganization of the Spanish River Pulp & Paper Mill has been effected and arrangements have been definitely made for the building of a paper mill and a sulphite mill which will cost $800,000. The new paper mill will have a capacity of 200 tons of paper per day. Building operations will be commenced next spring. The engineers will be Messrs. Joseph H. Wallace & Company, Temple Court, building, New York. Mr. W. J. Sheppard, of Waubaushene, will continue as president of the company and the new board will be composed of all the old members and several new ones.

South Vancouver, B.C.
The People's Trust Company, of New Westminster, will erect a two storey building on Fraser avenue. It is stated that work will commence at once.

Mr. A. Frederickson, corner of Main street and Twenty-seventh avenue, will erect a two storey business building.

It is stated that the property recently acquired by the People's Stock Company, of New Westminster, will have a there-storey business block erected on it, and the building completed by next year.

Sydney, N.S.
The Alexander Cross Company, Limited, of Glasgow, Scotland, has applied to council for support, etc., in their proposition to utilize the basic slag from the Dominion Iron & Steel Company's works in the making of fertilizer. About $40,000 will be expended.

Sault Ste Marie, Ont.
W. C. Franz, manager of the Lake Superior Corporation, is authority for the statement that arrangements have been made for the location of a paper mill here. The improvement of the waterfront from

the ship canal to Bruce street has been arranged for by the company.

Toronto, Ont.

The Canadian Autopress Company, Limited, have purchased a factory at the north-east corner of Eastern avenue and Carlaw avenue. An addition will be built.

Plans are being prepared in Montreal head office for the C.P.R. freight sheds to be erected along Front street. Dimensions, 500 feet x 50 feet, $25,000. Permit has been received.

Victoria, B.C.

Mr. S. Maclure, architect, is preparing plans for an extensive addition to the Dominion Hotel to cost about $60,000. Work will start as soon as possible.

It is reported that the Hudsons Bay Company purpose establishing a large departmental store on a site for which negotiations have been in progress for some time past.

Mr. Crawford Coates, architect, is preparing plans for a new block to replace the Bowness block destroyed by fire recently.

D. Spencer, Limited, have acquired the half block bounded by Fort, Broadview and Douglas streets as the site for their new business block.

The Dominion Trust Company has decided to commence building operations at once on the lot owned by the company fronting on Government street. An eight storey pressed brick modern office building is to be erected.

Alterations to the banking premises of the Canadian Bank of Commerce to the extent of about $12,000 will be started shortly.

Vancouver, B.C.

Plans were presented for a two-storey brick block for Mr. George H. Halse on Park Drive. The building will cost $14,000.

The Red Fir Lumber Company has completed its agreement to build a mill at Roche Point, near the site of the large 15,000 ton dockyard being erected by the Imperial Car Company. The company owns about 11,000 acres of timber land. The new mill will cut cedar only, about 100,000 feet per 10-hour day, and will cost, it is estimated, $100,000. Electric power will be used. President, C. C. Michener, Victoria, B.C., secretary-treasurer; P. D. Hillis, Victoria.

It is stated that clay extending for a distance of 4,000 feet along the water front has been discovered on the property of the Imperial Car Company and that it is suitable for the manufacture of first class pressed and common brick, tile and pottery.

Westboro, Ont.

A sash and door factory and a planing mill are to be erected by Mr. Mortimer Cumming, of Kazubazua, Ind. Construction will start shortly.

Windsor, Ont.

The by laws granting exemptions to the Windsor Burlington Blanket Company and the Penberthy Injector Company were carried.

The city council has granted exemption to the Winkley Company of Canada, whose plans call for the erection of a $15,000 building, probably on city factory site property.

Winnipeg, Man.

Jas. Richardson & Sons, Gran Exchange, are building another elevator in Alberta

The Standard Trust Company will remodel the old Bank of Montreal Building when it is vacated. Wm. Harvey, manager.

The Canada Metal Company, of Toronto, have purchased the property of the Ontario Wind Engine Company and will erect a large plant.

Burrows, Stewart & Milne, of Hamilton, Ont., have purchased a building site on James street. D. W. Bellhouse, architect.

E. R. Gabett, representing an English firm, is in the city to locate a site for a large creosote factory.

The Winnipeg Ceiling & Roofing Company have started erection of a plant at St. Boniface, 260 x 80 feet, cost $60,000.

The Rice Malting Company will put up a plant 86 x 280 feet, in St. Boniface, with an elevator 138 feet high. Cost, $255,000.

Jas. Alexander, president S. F. McKinnon Company, Toronto, has been in city with a view of having a new warehouse built.

The Louden Hardware Specialty Company will build a warehouse in Elmwood, on Martin street.

The Mercantile Investment Company have bought a large building site on Portage avenue and Spence street.

An office building is to be erected on Garry street, south of the Wellington hotel, by a syndicate. Solid brick with cut stone front, six storeys, cost $100,000. John Haffner is interested.

The Stewart Sheaf Loading Company will erect a factory at Elmwood next Western Iron Works.

Steele, Briggs Company have bought a new warehouse site on which they will build.

The warehouse belonging to J. H. Ashdown, Limited, will be extended.

Westboro, Ont.

The Cummings Lumber Company will erect a sash and door factory in Westboro this fall.

Woodnorth, Sask.

Hart Bros. are excavating for a new store building.

Yorkton, Sask.

A joint stock company is being formed to build a temperance hotel.

AWARDED.

Brandon, Man.

McDiarmid & Clark were awarded contract for interior woodwork C. N. R. depot.

Bassano, Alta.

M. C. Sacrider, of Medicine Hat, secured the contract to build the Union Bank building here. W. T. Williams, architect, of Medicine Hat.

Brandon, Man.

Robt. Lane has taken out excavation for business block to go up next spring.

Craven, Sask.

Mair & Sons were awarded contract to build C.P.R. station.

Nelson, B.C.

The contract for erection of brick and concrete building for Mr. W. Hancock has been awarded to Waters & Pascoe at $2,400. Others tendered: J. Burns & Son, $2,900; Jas. Dancy, $2,487, all of Nelson. A. Carrie, Nelson, architect.

North Battleford, Sask.

W. S. Glass has awarded contract for $6,500 brick warehouse to Mathews & Burdock.

New Liskeard, Ont.

The Canadian Office & School Furnishing Company has been awarded the contract for the interior fittings of the Union Bank, New Liskeard. J. P. MacLaren, architect, Ottawa.

Ottawa, Ont.

G. A. Crain has been awarded the contract for the warehouse and office of the Ogilvie Milling Company on oBtelier street.

The contracts have been awarded for Barrett Brothers' block in Main street, W. E. Noffke, architect. R. M. Saunders gets the masonry; McArthur Bros, the brickwork; J. E. Cooper, the carpentery; James Patterson & Son, the plastering, and Wm. Howe, painting and glazing.

Weiser & Son, of Arnprior, have been awarded the contract for terra cotta for the interior of the Hope Building.

The Empire Electric Company has been awarded the contract for the electric wiring and fixtures of the Hope Building. W. E. Noffke, architect.

The contract for the steel work of the Slinn-Shouldis, Limited, bakery, has been awarded to the Dominion Bridge Company. James Mather, architect.

Red Deer, Alta.

S. Long will have a solid brick block erected. Loveland & Miller have the contract for carpentry work and J. McIntosh the brick and masonry work.

St. Thomas, Ont.

The carpentry work in connection with the factory for the Monarch Knitting Company has been let to J. M. Green & Son.

The contract for erection of factory for the Monarch Knitting Company, Limited, of Dunnville, has been awarded to A. E. Ponsford, of this city, $35,000. F. R. Lalor, M.P., president.

Power Plants, Electricity and Telephones

Gretna, Man.

The town has decided to investigate the lighting of their streets by gasoline, and later on to put in an electric lighting plant.

Goderich, Ont.

The Board of Trade are in favor of the town asking the Hydro-Electric Power Commission's assistance in formulating a scheme for Maitland river power development, in case Niagara power proved too costly.

Medicine Hat, Alta.

The Alberta Electric Railway Company is seeking incorporation to construct 500 miles of electric lines in southern Alberta.

Moose Jaw, Sask.

An application is being made for an act to incorporate "The Moose Jaw Electric Railway Company," giving power to construct and operate a street railway in Moose Jaw, Sask. The company will have power also to acquire or construct suburban lines leading from the city.

Montreal, Que.

The Montreal Street Railway has announced their readiness to begin the construction of a belt line underground railway as soon as the city will give them the necessary legislation.

Niagara Falls, Ont.

The system of street lighting is considered [illegible]. Manager [illegible] estimated the cost of a new equipment at about $9,300.

North Toronto, Ont.

The ratepayers of North Toronto will on January 1st vote upon a by-law to author-

Tenders and For Sale Department

Notice to Contractors

Tenders will be received by registered post [illegible] addressed to the Chairman of the Board of Control, City Hall, up to noon on TUESDAY, NOVEMBER 22ND, 1910, for Electrical Measuring Instruments.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained from the Toronto Hydro-Electric System, City Hall, Toronto.

Tenderers shall submit with their tender the names of two personal sureties (approved of by the City Treasurer), not members of the City Council or officers of the Corporation of the City of Toronto, or, in lieu of said sureties, the bond of a Guarantee Company, approved as aforesaid.

The usual conditions relating to tendering, as prescribed by city by-law, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman Board of Control.

City Hall, Toronto, Nov. 10th, 1910. 46

City of Winnipeg

Electrical Distribution System

Tenders for 500 K. W. Motor Generator Sets

Sealed tender, on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope, "Tender for 500 k.w. Motor Generator Sets," will be received at the office of the undersigned up to 11 a.m. on THURSDAY, DECEMBER 15, 1910.

Copy of specification and form of tender may be obtained at the office of Smith, Kerry and Chace, Carnegie Library Building, Winnipeg, Canada, or at the office of the firm in Toronto, Ontario.

Each tender must be accompanied by a certified cheque as set forth in the instructions to bidders, which cheque will become forfeit to the corporation under the conditions set forth in that document.

The city reserve the right to reject any or all [illegible] accept any bid which shall appear advantageous to the city's interests.

M. PETERSON,
Secretary.

Office of the Board of Control,
Winnipeg, November 11th, 1910.

Positions Wanted

Advertisements under this heading one cent a word for insertion. Box No. ten cents extra

WANTED, position as Superintendent of Grading, [illegible], experienced. Box 154 "Contract Record," Toronto Ont. T.F.

ACCOUNTANT, six years with large American construction company, wishes position. Thoroughly experienced in contractors' detailed cost records. Excellent references. Box 159 "Contract Record." 46

Equipment for Sale

One Georgian Bay Hoist Engine, double cylinder, reversible, link motion, 15 h.p., new and complete with 150 feet of ½-inch steel cable.

One Steel Side Dump Car, 2-foot gauge, capacity one cubic yard; 400 feet of 20-pound steel rails, new, with bolts and spikes.

One 25 h.p. Second-Hand Locomotive Type Boiler, in good condition.

One Hand Derrick, with castings for both ends of boom and legs, 90 feet of ¾-inch wire cable.

One Friction Horse-Power.

STINSON-REEB BUILDERS' SUPPLY CO.,
Limited.
Eastern Townships Bank Building,
Montreal, Que.

46

---

ize the town council to expend $18,000 upon a plant for street and house lighting.

Nanaimo, B.C.

A by-law authorizing the Nanaimo General Electric Railway Company, when incorporated, to construct a street railway along certain streets, etc., is being prepared.

Quebec, Que.

At a meeting of the civic finance committee it was decided to allow the Dorchester Electric Company to enter this city from the south shore to carry on business here. Among the conditions imposed by the committee and accepted by the company is the construction of their works here, to cost $200,000, in the limits of this city, before 1st January, 1912, and other restrictions.

Red Deer, Alta.

At a recent meeting of the town council a resolution was adopted in favor of the hydro-electric scheme for the province towards which the council of Edmonton have already lent their support.

Seaforth, Ont.

The town of Seaforth has carried its final by-law authorizing contract with the Hydro-Electric Power Commission for 500 h.p. at estimated cost per h.p. of $41.25 per year for 24-hour power. The ratepayers of Mitchell vote on the question on the 15th inst.

Sherbrooke, Que.

The Sherbrooke Railway & Power Company has secured permission from Ascot council to erect poles for transmission of power from the plant in Sherbrooke to Capeton mines, a distance of eight miles. Other industries are now negotiating for power along the same route.

Toronto, Ont.

See "Public Buildings."

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until Nov. 22 for electrical measuring instruments. Advertisement in "Tenders and For Sale Department" of this issue.

Watrous, Sask.

The National Securities Company are entering into agreement for lighting system and electric car line to Manitou lake.

Winnipeg, Man.

Tenders are being called by Board of Control until Dec. 15th for 500 k.w. motor generator sets. Advertisement in "Tenders and For Sale Department," this issue.

AWARDED.

Montreal, Que.

The contract between the Saraguay Light & Power Company has been ratified by the Board of Control. The contract calls for the installation of 75 electric arc lamps at $90 per lamp for the Notre Dame de Grace Ward, more lamps being added as municipality grows.

Swift Current, Sask.

The contract for supply of installation of motors, dynamos and outside equipment for an electrical light and power plant, a gas producer and a motor and pump for a modern sewage disposal plant, it is stated, has been awarded to Carter-Jones Company of Fort William, Ont.

Winnipeg, Man.

The contract for supply of 115 h.p., 60 cycle induction motor was awarded to Siemens Bros., Toronto, $330; that for drive therefor, to Jones & Glassco, Montreal, $66.11.

Miscellaneous

Hamilton, Ont.

The following building permits have been issued; H. New, architect, erection of a brick dwelling on Mount Royal avenue, for Dr. O. S. Clappison, $3,500; Stewart & Witton, erection of a two-storey brick factory building 65 by 125 feet, and a dry kiln 50 by 40 feet, on Arthur street, east of Sherman avenue, for the Ludlam Ainslie Lumber Company, $12,000; Stewart & Witton, addition to factory on Mary street, corner Kelly, for Chipman-Holton Company, $5,700.

Ottawa, Ont.

Recent building permits include: M. Miskell, dwelling, Clarey avenue, $3,400; J. D. Wilson, dwelling, Monk street, $3,000; Philip Lennox, dwelling, Lyon street, $6,000; J. A. DesRivieres, dwelling, Cathcart street, $3,000; Geo. Eaman, dwelling, Florence street, $4,000; Frank Wilson, dwelling, 3rd avenue, $2,500; D. L. Campbell, 4th avenue, dwelling, $3,000; A. E. Shaver, Powell avenue, dwelling, $5,500; D. L. Beaudet, shop and dwelling, $5,500; F. Dumond, dwelling, Wm. Gibson, builder, $5,500; G. L. Barrett, shops and dwelling, W. E. Noffke, architect, Main street, $8,000; W. J. Baird, dwelling, Balsam street, $2,700.

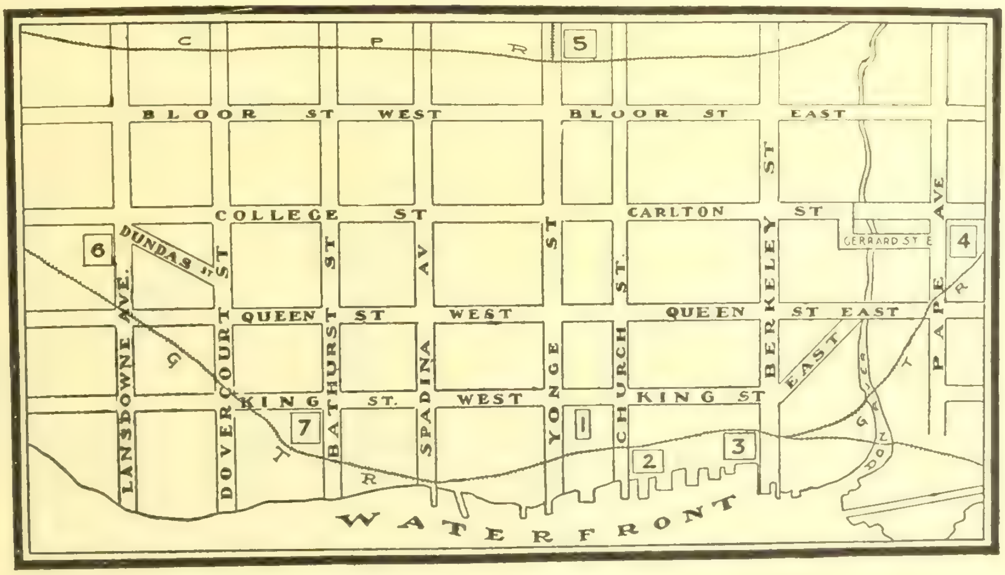
Toronto, Ont.

Recent building permits include: R. Burkell, one pair semi-detached 2½-sty. brick dwelling, Bloor street west, $5,000; Coltman & Pearson, pair of semi-detached 2 storey brick dwellings, 180-2 Sunnyside avenue, $8,000; Bailey & Leslie, pair semi-detached two storey and attic dwellings, Thorold, $5,400; J. D. Farquhar & Self, pair semi-detached and two detached two-storey brick dwellings, aBin avenue, $8,- storey brick dwellings, Bain avenue, $8,- and a half storey brick dwellings, Geoffrey street, $9,000; Annan & Jones, pair semi-detached two-storey brick dwellings, Palmerston Gardens, $4,500; R. B. Storey, two detached two and a half storey brick dwellings, College street, $8,000.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

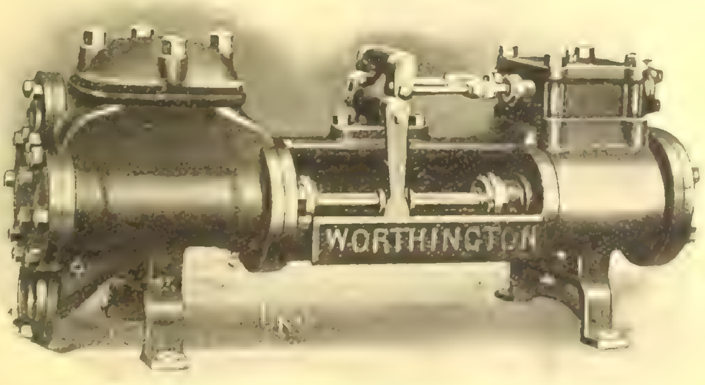
Telephone Main 4155 No's 2, 4, 5, 6



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, Toronto

WORTHINGTON STEAM PUMPS



IN STOCK FOR

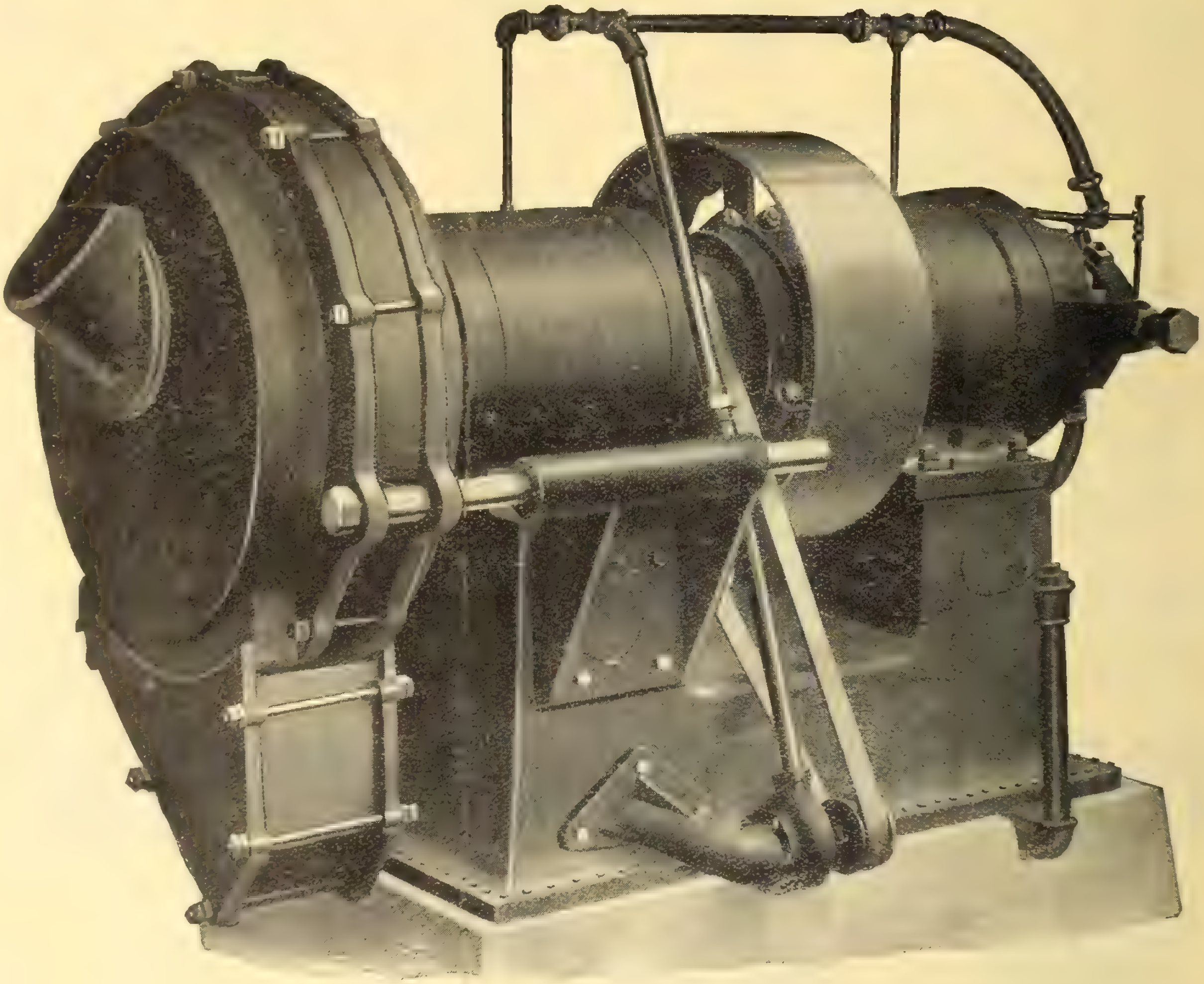
Boiler Feed
Water Works
Fire and
General Purposes

Works:
512 William St., Montreal

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

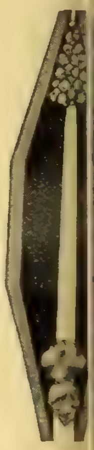
Limited

A New Princ



Sy

Cr



Look

Takes large rejections or granite boulders and in one operation crushes down to any size

The largest size takes 8 inch stone and makes any size down to 1-2 inch and less.

The medium size takes 4 inch stone and makes any size down to 1-4 inch and less.

The small size takes 2 inch stone and makes any size down to 1-8 inch and less.

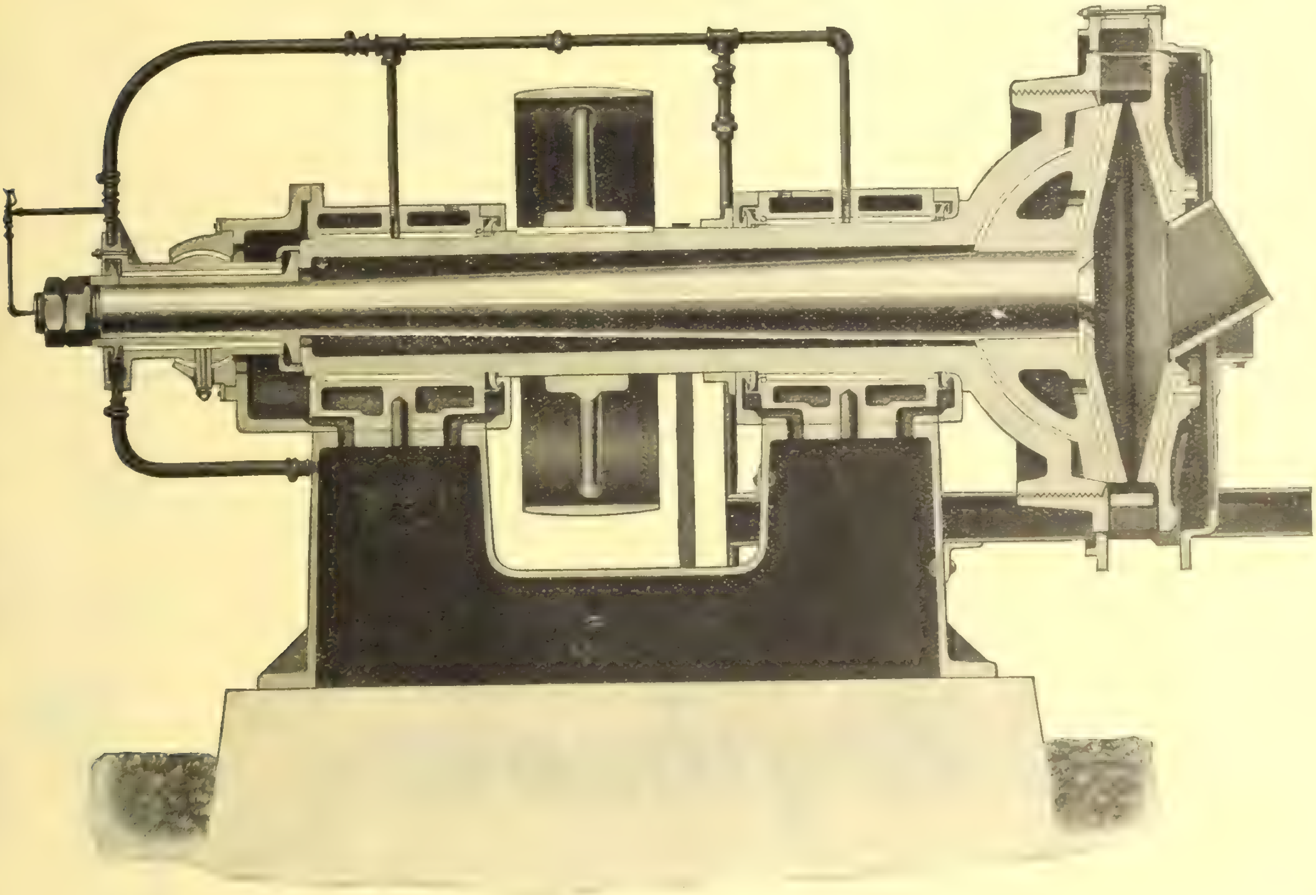
The Crusher has two Dish Shaped Manganese Steel Discs the hollow sides of which face ea other. These discs rotate in the same direction at the same speed. The stone is fed

Head Offices and Warehouses :

Montreal

MUSSEN

e in Crushing



een them through a central feed opening and is caught between them where they are
idest apart, and carried around with them to where they are closest together being crush-
l in going halfway round. The smaller particles fly out during the next half round and
e larger pieces caught again. The crushing movement may be regulated while the
usher is running.

Let us send you full information. Free on request.

LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden Concrete Floor Dressing

for the maintenance of concrete floors; protecting them against abrasion and wear. Notice the surface of a concrete floor. The grating action of the foot with this rough surface constantly loosens dust particles of concrete. This condition is detrimental to both floors and contents of room. Reinforces soft disintegrated floors.

Glidden Concrete Floor Dressing

will absolutely preserve the floors and prevent dust formation. Reduces vibration and produces a soft, easy tread.

Write for booklet containing Specifications and Description of the many Glidden Concrete Finishes—including the above

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio

Distributed in Canada by

Stinson-Reeb Builders Supply Company **Eastern Townships Bank Building**
Montreal, Quebec

THE NORTHERN ELECTRIC AND MFG. CO. LIMITED
FIRE ALARMS TELEPHONES SUPPLIES

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 2016 Type-Metal Inter-phone for desk use

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

No. 1324 Non-Flush" Type-Metal Inter-phone for wall mounting

THE Northern-Electric
AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.

HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto November 16, 1910 No. 46

Contract Work and Day Labor

The various contentions made in recent issues of the *Contract Record* by the respective advocates of the contract system and day labor are the basis of an interesting editorial published in the last isue of "*Engineering Contracting.*" While our Chicago contemporary criticizes the attack made by Canadian contractors upon day labor work as having been directed with "poor effect," it admits that some of the points raised deserve notice and also makes the significant observation that *Canadian cities appear to get better results out of day labor than American cities.* Continuing, the article runs:

The charge made against city bidding, as we gather, is three-fold: (1) The competition is not on a fair basis: (2) the quality of work secured is not superior, and, (3) the employment of public money to destroy private enterprise is wrong. None of these charges is very strong and two of them are in addition in our opinion wholly misdirected.

The contractors claim that competition is not on a fair basis because the city engineer bids on work which he will control and, consequently, he is in a position to deal leniently with himself in obeying specifications. Again they argue that the basis of competition is unfair because the engineer takes no financial risk as a contractor must do. These claims have an appearance of importance which is misleading. The measure which we must use here is not bidding price but quality and cost. If the engineer is lenient with himself the quality of his work will in the long run be inferior. Risk is an item which cannot be escaped. The engineer personally may not bear the charges and he may not include it in his bidding price but it exists and is paid by some one and is a part of the cost of the work. Appraised by the measure of cost and quality of work and not by the measure of bidding price these "advantages" against which the contractors complain do not amount to much.

The charge that the quality of day labor work is not superior is doubtless sound. We do not speak with full knowledge of Canadian conditions but we do speak with extended knowledge of the facts in the United States. At comparable prices day labor construction in America is seldom superior and is quite often inferior in quality to well supervised contract construction. There is no plain reason why conditions should be different in Canada and we doubt if they are.

The final plea of the contractors against the employment of public money to destroy private enterprise is an admission of weakness. There is no greater reason why a city should give its work to contract so as to support the contracting business than why it should do its work by day labor so as to afford employment to indigent or inefficient laborers to prevent them from becoming burdens on the city's charitable institutions. If charity is to be distributed in either case it is cheaper and better to give pensions to the inefficient and disabled and have done with the matter.

We have been ruthless in criticizing the arguments of our Canadian contractor friends because we believe that they are losing by them a sure chance of victory. There is but one criterion for comparing the merits of contract work and day labor work and that is cost and quality. If a city can by day labor do its public work as well at less cost or better at the same cost than by contracting for it, it should most certainly do it by day labor. We do not believe that in the long run it can; much less do we believe that as a general policy day labor work can equal in cost and quality work done by contract. The facts wherever they have been demonstrated fully and fairly are against such belief and the burden of reason supports the facts. If Canadian contractors wish to convince the public that the day labor system of work of Canadian cities is wrong they should apply the measure of cost and quality by actual comparative figures and not forget that the city engineer's bidding prices are not costs.

In all the letters of the city engineers who have taken part in the debate in the columns of the *Contract Record* there is not a figure showing that day labor work costs less than contract work in Canadian cities. Nor do we find in their letters a definite assertion that the quality of day labor work is better than contract work. The most definite statement that we find anywhere is the following:

> The assertion that poor workmanship and material are put into the work by the city engineer if he undertakes the construction does not bear the appearance of fact. The engineer, it is seen, is the one most interested in having his design correctly executed in every way, for upon the results he is adjudged competent or incompetent.
>
> As far as the engineer is concerned, he reaps the advantage as he is saved both the contractor's profit and the salaries of the inspectors.

That the engineer is interested in having his work good no one will dispute. He is no less interested when the work is being done by contract than when it is being done by day labor and he supports his interest by putting inspectors on the contract work. The engineer is also interested in having his day labor work cost no more than his biding prices, by this also will he "adjudged competent or incompetent." Suppose the engineer makes a low estimate, as contractors sometimes do, and as he is quite as likely to do as are contractors, he must take care of it either by doing the work well and charging up the loss or by skimping the work so that it will come within the estimate. The contractor in a similar position will and must do one or the other of these things, but he has to accomplish the "skimping" should he choose that resort in spite of the engineer's inspectors. Now we will say frankly that our belief in the rectitude of engineers is such that we think that between the two ways open to him he will choose to make the work good and charge up the increase over his cost estimate, but if he chooses the other way it must be admitted that it will be easier for him to succeed than for a contractor. We bring out these points not to curb suspicion on the honesty of engineers' day labor work but merely to show that the second sentence of our city engineer's statement is not so completely final a disposition of the matter as it sounds to be.

In his last sentence our city engineer harks back to the silly old bugaboos of the "contractor's profit" and "cost of inspection." What is the contractor's profit but pay for services? Some one must manage the work and get paid for it, if there is no contractor the city must hire a manager. There are no two ways about this. As for inspection it cannot be omitted safely on any construction work whether done by day labor or by contract. This is a fact so well recognized that day labor construction of any importance is seldom carried on without inspection.

From the following paragraph, culled from a recent issue of the *Victoria Times*, it would appear that there is not very much competition for the work of repairing the Smith's Hill reservoir at Victoria. Those who read the article published in our last issue, in which we discussed the conditions upon which it was proposed to award the contract, will be interested in further news of the work:

"Thus far there have been but few enquiries from local contractors relative to the work of repairing the Smith's Hill reservoir, and it is believed but few bids will be received. A firm in Vancouver is among the number likely to tender. The conditions imposed on the successful contractor are most onerous, as, besides putting up a guarantee bond, he must leave 25 per cent. of the contract price with the city for a period of five years."

Pavements and Illumination

Pavements and illumination were recently associated in a novel way by Mr. Preston S. Millar, who claimed in a paper read before the Illuminating Engineering Society that the character of street surfaces has an important effect on street lighting. This is a novel source of complication to the already involved problem of paving, says the *Engineering Record*. The municipal engineer is expected to train his ear so well that the delicate shades of noise from granite and gneiss blocks can be detected and estimated quantitatively. He is expected to know just how much more easily a horse will slip on blue gum blocks as compared with those of long-leaf pine. He is assumed to know the effect on public health which will follow the paving of Main Street with sheet asphalt and Front Street with brick. He is also expected, ex-officio, to be able to purchase a $3.00 pavement for $1.25, with a 10-year maintenance guaranty thrown in by the contractor. All these things the city engineer has learned the expect among his official duties, but a protest is inevitable when it comes to selecting pavements on the basis of their properties for absorbing and reflecting light. A noisy pavement is a nuisance in some localities, a slippery pavement is dangerous on some grades, a smooth pavement offers special advantages in the way of cleanliness; these considerations are based primarily on the direct service due from pavements and must be given due weight. But it is unreasonable to select pavements with a view to improving the quality of street lighting, much as the electric companies would rejoice in this practice. By all means let us learn all we can about the absorption and radiation of light from street surfaces, but let it be distinctly understood that the information is to be used in improving the quality of the illuminating service and not in adding another condition to those now prescribed for pavements.

Canadian Cement and Concrete Association to Meet at Toronto

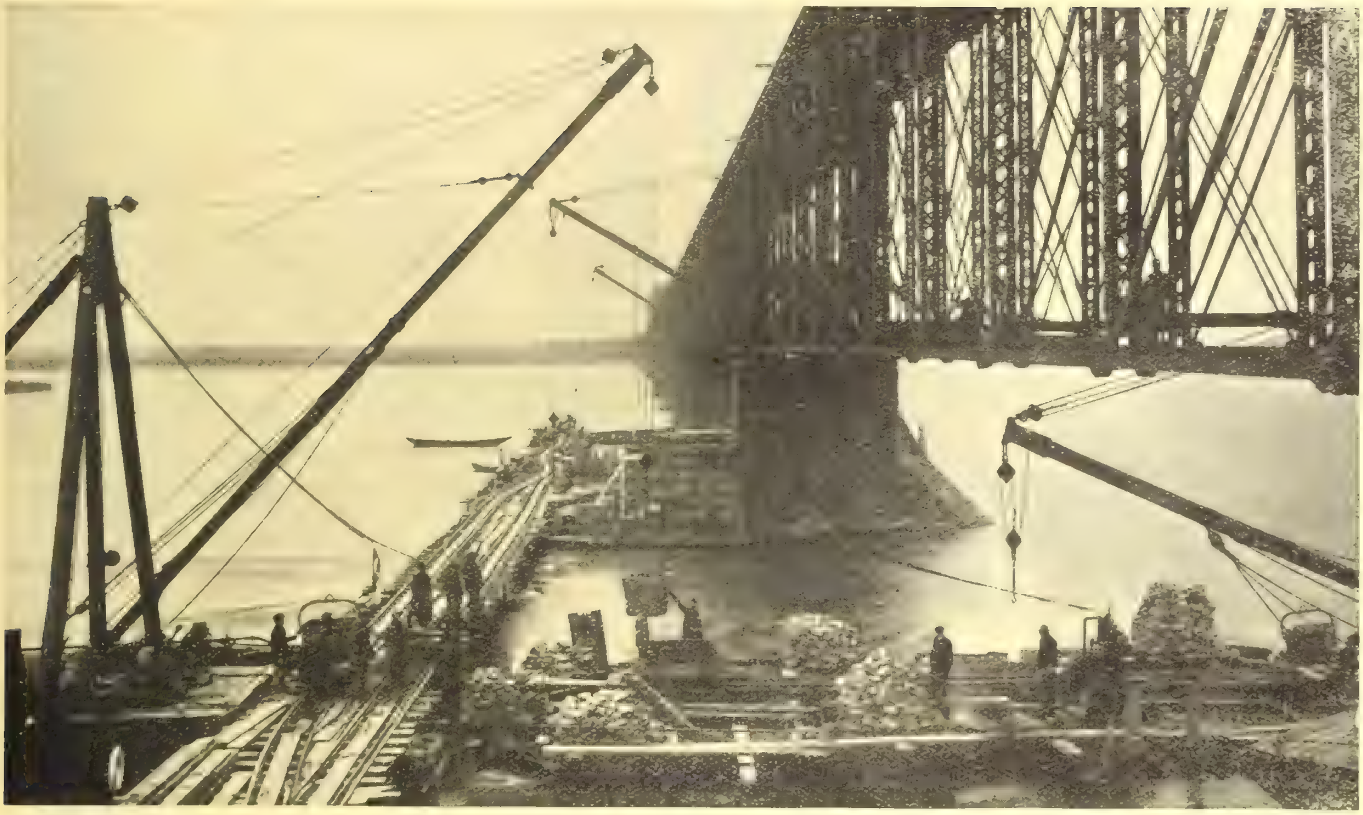
The annual convention of the Canadian and Concrete Association will be held January 16-20 next. There is every prospect of a record meeting. Mr. R. E. W. Hagarty, secretary of the Association, expects an unusually large number of delegates, consisting of architects, engineers and contractors from all parts of Canada and from the United States. Such distant points as Vancouver and Halifax will be represented at the conference. Special railway rates are being arranged and other facilities provided with a view to stimulating the interest of all persons interested in cement and its allied products. The third week in January is particularly well chosen, as it will enable exhibitors at the New York Cement Show in Madison Square Garden in December to visit Toronto on the way to the Chicago Exhibition in February. Intending exhibitors and others should address enquiries to the secretary, Mr. R. E. W. Hagarty, 662 Euclid avenue, or to the president, Professor Gillespie, University of Toronto

Caisson Foundation for Sewer Outlet

A method of constructing a caisson foundation for a sewer outlet at the end of a drop chamber extending down the bank of the Ohio river, is given in the report of Chief Engineer J. B. F. Breed, and Harrison P. Eddy of Boston, consulting engineer, of the Louisville, Ky., Sewerage Commission.

By the original plan, the outlet structure was to be carried down to bed rock, which was supposed to be within a moderate depth below the bed of the river. But when low water in the river made a more careful examination possible, the bed rock was found much further down than was expected. A new design was, therefore, made providing for a foundation of caissons sunk to rock.

The trench for the proposed outlet being excavated to grade, the caissons were sunk. There were composed of steel cylinders five feet in diameter and in four and five-foot lengths. The bottom section was provided with a reinforcing band at the lower end. At the other end and on each end of the other sections, the cylinders were provided with flanges by which they were bolted together. In order to make the joints tight, rubber gaskets were used, with the aid of oakum when necessary. One section was set in its proper position and the material excavated from within by hand and as fast as necessary succeeding sections were bolted on. Usually the weight of the steel was enough to force the caisson into the ground, but at times the movement was aided by hammering or by jacks, which reacted upon the timbering of the trench. The ground water within were lowered into the caissons. But little ground water was found, as the materials through which the caissons were driven was largely impervious, being strata of fine salt, clay and cemented chips of slate rock. The completed caissons were filled with concrete and upon them the outlet structure has been built.



C.P.R. Bridge, Lachine, showing 1000-foot tramway built by Foundation Company to Facilitate Erection of Piers

Reconstruction of the Lachine Bridge

Methods Adopted by Contractors in Rebuilding C.P.R. Structure over St. Lawrence River—A 1000-ft. Tramway and other Noteworthy Facilities

With the Canadian Pacific Railway Company's decision to double track the railway between Adirondack Junction and Montreal Junction, to keep pace with the phenomenal growth of traffic around that centre came the necessity for the reconstruction of the large bridge which spans the St. Lawrence River at Lachine.

The original bridge was a single track structure, about 4,000 feet long, and consisted of eight single track spans of 250 feet, two of 270 feet, two cantilever spans of 408 feet, one deck span of 122 feet and three girders of 80 feet. The structure was built in 1886 by Messrs. Reid & Fleming, of Montreal, contractors for the masonry, and the Dominion Bridge Company, for the superstructure.

The contract for the foundation work and masonry of the new structure was awarded to the Foundation Company, Limited, of Montreal, and for the superstructure to the Dominion Bridge Company, Limited, also of that city.

Work on the foundation was started in July of this year and is progressing rapidly, so that by the time winter sets in a large portion of the work will have been accomplished. In the foundation of the old bridge there were eleven piers in the water, four piers on the

Construction in Progress, Showing Working Facilities

Building Cofferdam in erection of New Pier

View of Bridge and Tramway, looking toward North Side

shore and two abutments. In the reconstruction it is intended to have four additional piers in the river. The reconstruction of this work is considered a most difficult one, the current of the river at low water at this point running ten miles per hour and at high water twelve miles. The distance from the base of rail to high water is about 60 feet, the depth varying at low water from eight feet on the north side, gradually sloping down to thirty feet on the south side.

It is interesting to note the method employed in the building of the old piers in 1886. These were constructed by building single wall casings on the shore, caulking them, floating and placing them on the bottom after it had been dredged out. The bottom was then cleaned off by divers. A few feet of concrete was deposited under the water and allowed to set, the coffer dam was pumped out, and the concrete footings and masonry were then built in the usual way. The present contractors state that the piers are now in excellent condition and have not settled in the slightest degree. This reflects great credit on the original builders.

Operations on the new bridge were commenced from the north shore. In the construction of the piers the engineer in charge requires that no concrete shall be deposited in the water, but that the solid rock shall be cleaned off, examined in the open or in pneumatic caissons. A diamond drill outfit has been installed and holes have been drilled in existing piers where the extension of new piers is to be placed. These borings showed gravel and boulders varying in depth from six to ten feet, and underneath about three feet of limestone.

The method of operation of the contractors is to dredge off the bottom, and then build a double wall coffer dam, fill the double wall with clay and pump out the dam.

In order to have easy access in working around piers the company have built a tramway, 1,000 feet long, out into the river and parallel with the bridge. All the material is delivered on the high trestle on cars. Up to the present time they have built and sunk nine coffer dams in the water. Seven of these have been pumped out and filled with concrete to the point where the masonry starts. On five of these piers the masonry has been laid up to the height of the old bridge seat. It is intended that all the open work piers shall be finished this year and the pneumatic caisson work left over until next season.

Building Additions to Existing Piers

When the work on the bridge is completed the structure will be one of the finest on the railway systems of the Continent.

Experiments in Binding Gravel and Crushed Gravel with Tar and Asphalt

Desiring to secure the best possible results from the use of the local road-building materials, the State Highway Department of Ohio decided to experiment with tar and asphalt in binding the Darke County gravel before preparing specifications for these roads. It was also desired to determine if the gravel could be water-bound after the manner of binding crushed stone in the water-bound macadam roads. A section of road was selected, and work was begun on July 20th and completed by August 13th.

Nine hundred gallons of Tarvia "X" and the same amount of Indian Refining Co.'s Asphalt were used in the experimental work. The roller used weighed 15 tons without water or coal. It was not satisfactory for this work as it has been found that better results can be obtained with a 10-ton roller, but it was the only roller available. The width of the surface treated in this experiment is uniformly 16 ft.

In this work the Tarvia was applied at a temperature of from 340° F. to 400° F., and the asphalt at a temperature of from 400° F. to 450° F. There was a good bed of gravel in the old road, and this was prepared to receive the top course by spiking up the surface with the steam roller and harrowing and grading to bring it to the proper cross-section, after which it was thoroughly rolled and watered. Beginning at the north end of this experimental section, the first 80 ft. in length was treated in the following manner:

Washed gravel from 1 in. to 2 ins. in diameter was spread on the surface to a depth of 3 ins. The gravel was then rolled and about 1½ gal. of Travia "X" per square yard was applied. It was then covered with ½-in. to 1-in. gravel to a depth of about 1 in. This was allowed to stand until the next morning and was then rolled until buckling commenced. Three-fourths of a gallon of Tarvia per square yard was then poured over the surface and a covering ½ in. thick of gravel from 1 in. to ½ in. in size was applied. The next morning it was rolled for 1½ hours, when it began to show signs of buckling. More gravel was applied at places where the

Tarvia was bleeding, in sufficient amount to take up the Tarvia.

The second section, lying south of and adjoining the first-described section, was 72 ft. in length, and was constructed in the following manner:

The bottom course, composed of ½-in. to 1½-in. washed gravel, was spread to a depth of 3 ins. and treated with the same amount of Tarvia and in the same manner as described for the bottom course of the first section. The second course, composed of ¼-in. to 1-in. washed gravel, was spread to a depth of 1 in., and rolled as in the first section. Thirty-two feet of the north end of this section was poured with 1 gal. per square yard of Tarvia mixed in equal parts with unrefined coal tar; the remaining 40 ft. was treated with 314 gals. of the asphalt binder per square yard. The part which received the tar was covered to a depth of ¾-in. with ⅛-in. to ½-in. washed gravel, more being added where bleeding appeared. The asphalt-treated part was covered with ½-in. boulder chips to a depth of ½-in. This section was rolled the next morning the same as described for the first section.

The third section adjoining the second section on the south, was eighty-eight feet in length, and was constructed as follows:

The bottom course, composed of 1-in. to 2-in. crushed boulders 3½ ins. deep, was placed in the same manner as in the first section, and poured with 1¾ gals. of Tarvia "X" per square yard. This was covered to a depth of ¾ in. with ⅛-in. to ¾-in. gravel, and rolled the next morning in a manner similar to the rolling of the first section. Three-fourths of a gallon per square yard of Tarvia "X" was then added and the surface covered to a depth of ¾-in. with ⅛-in. to ½-in. washed gravel. This was rolled two hours without signs of buckling. Gravel was added where bleeding appeared.

The fourth section was 130 ft. long. The bottom course was composed of 1-in. to 2-in. washed gravel, with 30 per cent. of broken boulders, spread to a depth of 4½ ins. It was poured with two 2½ gals. of asphalt binder per square yard, and was then covered to a depth of 1 1-3 ins. with ½-in. to 1½-in. washed gravel. It was rolled the next morning, but buckling commenced in about one-half hour and the rolling was stopped. It was then poured with ¾ gal. of asphalt binder per square yard. The north 80 ft. of this section was covered with ⅛-in. to ½-in. washed gravel; the remaining 50 ft. was covered with 1¼-in. to 1-in. boulder chips. This was rolled the next morning and buckling commenced in about one half hour.

The fifth section, which was built of 1-in. to 2-in. crushed boulders, was 130 ft. in length. The bottom course was spread with the above material to a depth of 4 ins. This was partly filled with a clay filler, and the filling was completed with limestone dust rolled in with the steam roller until all of the voids were completely filled. This section was then thoroughly watered and rolled until a grout appeared on the surface. On the second day it was again watered and rolled thoroughly, and sand was added during the process of rolling. This section rolled down and became very hard and compact.

The sixth section, which was constructed of 1-in. to 2-in. washed gravel, to which 30 per cent. of crushed boulders had been added was 100 ft. in length. It consisted of one course 4 ins deep, and was slightly filled with clay in the manner described in the fifth section. The filling was completed with limestone dust, which was thoroughly watered and rolled. The rolling was continued until a grout formed over the surface, and the road was again rolled on the second day. In appearance this section is similar to the fifth section.

In addition to the rolling above mentioned, the roller was run over the completed work each day until the last section was finished. One month after completion the road was in perfect condition except two or three small spots that had raveled in the part where unrefined tar had been mixed with the Tarvia.

The total cost of the experimental roadwork was $669.70.

Method of Estimating Costs of Piping and Wiring for Buildings

and on the cost of erecting steam piping for heating and power are extremely scarce. A "rule of thumb" method employed by various Chicago consulting engineers averages about as follows, says *Engineering-Contracting*:

Labor cost of electric wiring (mill buildings): For lighting, $1 per light; for power, $2 per horse power per motor. When figuring the above to include material (except motors) use $4 per light and $10 per horsepower, respectively. In figuring the cost of erection of piping for mill heating for buildings, the rule is to use $1.25 per sq. ft. of radiation required. For the cost of installing steam pressure pipe and similar pipe, the rule is to multiply the estimated cost of the material by 2¼, that is 1¼ more than the cost of the material. When figuring the general cost of material and labor for installation of power, piping and machinery, $250 per horsepower is used. These rules are all worked out for union labor rates of wages.

Fieldhouse Patent Sewage Tank

A circular sewage tank of concrete 82½ ft. in diameter is now under construction at the disposal works of Guildford, England. It comprises a central inlet chamber and sludge pit, and an annular effluent chamber divided into six separate compartments with an effluent channel running entirely around the circumference of the tank. The tank is of the Fieldhouse patent type and its principal features are outlined by Mr. C. G. Mason, borough engineer and surveyor, in a paper presented before the Institution of Municipal and County Engineers, the source of these notes. The central chamber is 26 ft. in diameter and 26 ft. deep, its sides being built at a steep slope. The lower portion of this chamber, which forms the sludge pit, is covered by an inverted concrete cone, with a 2-in. annular space around its lower edge. The flow enters the central tank through a 15-in. pipe which discharges over the cone, the sludge falling through the annular space already noted into the pit below. The effluent passes radially through openings in the side walls, into six outer compartments where sediment escaping from the central tank settles; these outer compartments have steeply inclined sides and sludge pits drained by 9-in. pipes. From the outer compartments sewage passes over the circumferential weir, 260 ft. long, and then flows into the effluent channel. Scum also may be removed from the surface of the tank, which is divided into 17 parts, into the effluent channel, sluices being arranged to direct the scum into a scum pit and thence to a sludge tank. The effluent channel is protected by scum boards.

The annual convention of the Canadian Society of Civil Engineers will be held at Winnipeg, Man., January 24-27 next. Communications should be addressed to the secretary, Professor C. H. McLeod, Montreal, Que.

Details of Proposed Sewers at Leavenworth

Constructional Data on an Interesting Municipal Undertaking—Sewers above ground — Design of Special Castings — Unit Contract Prices

In designing main trunk and lateral sewers for Sanitary Sewer District No. 9, at Leavenworth, Kan., the latitude of the design was limited by a great many natural conditions. The district consists of several minor drainage areas and contains numerous creeks and "draws," making the topography very rough and broken. At points where creeks cross alleys and streets there are located culverts and bridges, the crossing of which controlled the grades of the sewers almost absolutely. Added to this, the several additions to the city comprising the district were poorly plotted when originally laid out and the arrangement of streets and alleys is bad; in some cases there are two and three alleys in one block, plotted as T and H alleys; in other cases there are no alleys, and it was necessary to condemn right-of-way for sewers. In order to lay out the main trunk sewer so as to provide for lateral sewers in each block, the alignment was controlled entirely by these requirements, and the topography had to be disregarded for the most part. Being thus controlled in grade and alignment, the depth varied from very shallow to exceedingly deep work, sometimes through 12 or 15 ft of rock. In crossing creeks and ravines it was often necessary to have the sewer above ground. These "exposed" sewers will be discussed in this paper.

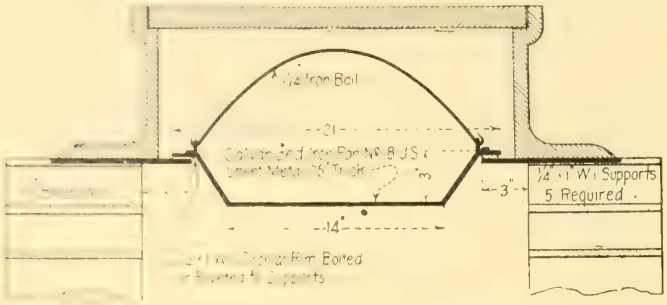


Fig. 1—Manhole Top, Exposed Sewer

It was deemed best to use light weight, bell and spigot cast iron pipe supported on concrete piers, and to provide for the free expansion of the pipe. To atttain this end, it was provided that the piers be mounted with cast iron pier plates, anchored into the concrete; on these plates were to be placed several lengths of round bar iron at right angles to the line of the sewer to serve as rollers; and fitting over the top of the plate and rollers in such a manner as to secure the rollers from falling out, but at the same time to permit them to roll on the plate with the expansion and contraction of the pipe, a saddle, Fig. 1, to fit the outside diameter of the pipe.

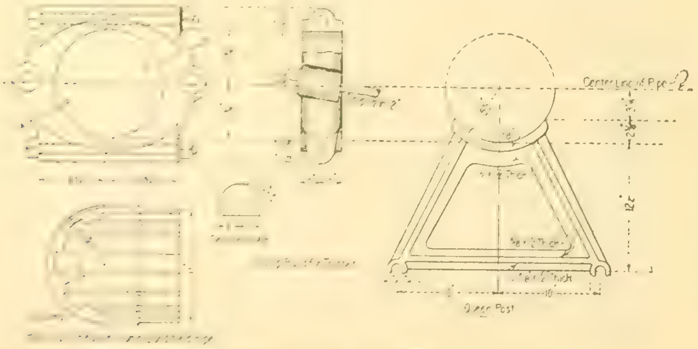


Fig. 2 Saddle Support and Trussing Details, Exposed Sewer

To avoid placing piers in creek channels where they would obstruct the flow, it was necessary to get a wider panel than 12 ft., and a truss was designed to support the intermediate joint. The truss consists of clamp bands, Fig. 2, to fit the circumference of the pipe and hold the truss rods in place, a queen post and a set of rods, as shown. In estimating the cost of the work, it was found that the complete truss was less expensive than the pier with its necessary castings, so it was decided to make the panels 24 ft. instead of 12 ft., and to use a truss between each set of piers. To provide further for expansion, it was decided in cases where there was more than 75 ft. of exposed pipe in a span to place an expansion joint. The regular type of iron body, brass sleeve expansion joint was specified.

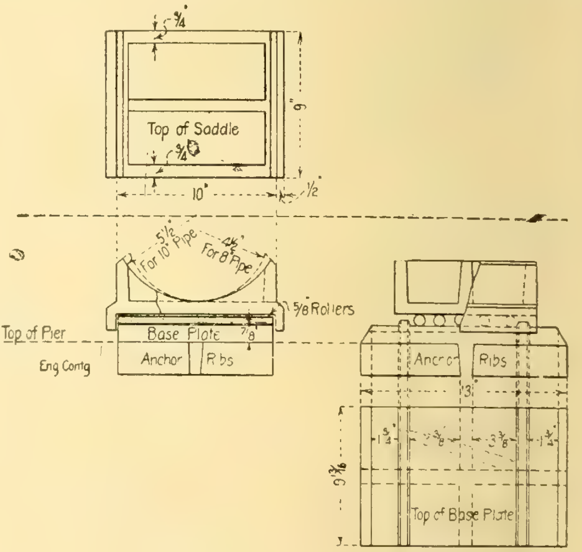


Fig. 3—Details of Saddle Support for Exposed Sewer

While the expansion in an iron pipe with a flow of sewage would be very small, owing to the almost constant temperature of the sewage, and might be taken care of by the "giving" of the lead in the joints, at the same time the loosening of the lead from expansion and contraction would cause leaks that would require attention later on, and it was considered necessary to install expansion joints.

In designing the special castings required for this work, every effort was made to have them simple, yet strong. To provide for different sizes of pipe, bushings were used where possible, or one casting only of a set was altered. This reduced the number of patterns required for the castings and kept the castings standard as far as possible. The castings required for the work were made by local foundries.

The unit contract prices for this class of work were as follows:

10-in. light weight cast iron pipe in place, $1.50 per ft.

8-in. light weight cast iron pipe in place, $1 per ft

Trusses for 10-in. pipe, complete and in place, $16.50 each.

Trusses for 8-in. pipe, complete and in place, $18 each.

10-in. expansion joints, complete and in place, $55 each.

8-in. expansion joints, complete and in place, $45 each.

Concrete piers 5 ft. high or under, fully equipped with castings, $22 each.

Additional height of piers, $3 per ver. ft.

Unusual Example of Pneumatic Caisson Work

The deep foundations for the new Municipal Building, in New York, are notable for the magnitude of the work and its rapid execution under great difficulties, and for the manner in which perplexing contract difficulties were equitably adjusted. The substructure is designed to carry a 165,000-ton superstructure, rising to a height of 580 ft. above the street, on 106 separate piers. Some of these piers are supported on solid rock and some on sand and quicksand, the latter being without any appreciable variation in the slight settlement they have shown. These foundations have been sunk far below the ground-water level to depths closely approaching the limits for pneumatic pressure. Thousands of yards of sand and quicksand have been excavated far below the surface without injury to adjacent tall and heavy buildings. Elevated and subway railroad structures, and large gas, water, sewer and electric mains below the street surface were maintained in service with no serious interruption to the heavy traffic of vehicles, pedestrians, and street cars on an important city street which crosses the full width of the building. This work of sinking the piers has been accomplished in about a year at a cost of about $1,500,000, and without serious accident or the loss of life, by methods described elsewhere in this issue.

The caissons vary greatly in size, form and depth and are of several distinct types, showing the most recent improvements in construction of this sort, together with new features developed to meet the special conditions existing at the site. The working chambers are of steel where the greatest economy of space is necessary, and of reinforced concrete where there is abundance of room, while in intermediate cases wooden caissons, heretofore standard for all but the smallest piers, are used. Permanent wood and steel are almost eliminated from the finished structures and the strength and weight of the concrete were utilized largely in the construction operations.

Rapid and efficient work in a very congested area enclosed by streets with heavy traffic of all sorts has been accomplished by the installation of a battery of steam boilers of over 1800 h.p. capacity, seven large air compressors, 26 hoisting engines, 11 steam pumps, 16 air locks, six concrete mixers, 56 steel buckets and other equipment in proportion, all located within the limits of a 164 by 374-ft. triangular lot. Storage was largely eliminated by the delivery of material only as needed, plant and materials were handled without delay and shifted repeatedly by a system of 26 traveling and movable derrick booms, and extra space was provided by elevated working platforms under which foundation operations could be carried down. Economy and rapidity of construction were promoted by the construction of the deep piers in rapidly shifted forms, entirely above ground, and by building them up to heights reaching a maximum of 60 ft. before sinking.

The piers, with maximum loads up to 5000 tons, were at first designed to have all foundations carried down to rock, but when it was found that the danger and expense of reaching the deepest rock were too great, additional investigations and practical tests were made on the bearing capacity of the soil and part of the piers were redesigned and proportioned to rest without serious settlement on the sand far above the rock. Fortunately the heaviest and tallest part of the building has rock foundations and it is believed that the loads on the other piers are so well within the tested bearing capacity that no injurious settlement will be occasioned by their final loads.

After the contract had been made for 116 caissons to be sunk to solid rock and the work was well under way, it was decided to eliminate 10 of the piers and modify the design of 30 others, which were to be sunk to a less depth than at first proposed, thus greatly changing the condition and cost of the work. The advantages and disadvantages accruing to both the owner and contractor from these changes were carefully studied; allowances were made for the elimination of very dangerous and costly work, for the loss of reasonable profits, for the delay in operations and change in plans and material, and for fixed and overhead charges. An equitable basis of unit prices was deduced from the results of this investigation, and the original contract was accordingly modified to suit the new conditions in a manner that was satisfactory to both parties and is believed to afford a valuable basis for the readjustment of future contracts. These results are due to the harmonious efficiency of engineers and contractors, experienced in caisson work and in general construction, unhampered by interference from the laymen connected with the city administration.—*Engineering Record.*

A vein of rich red marble has been discovered at Trenholmville, near Sherbrooke, Que. A Montreal company is stated to be negotiating for the property.

Building permits issued in Toronto last month are valued at $2,914,980, as compared with $1,540,355 for October, 1909. The total for the ten months' periods of 1909 and 1910 are $14,605,232 and $17,731,488 respectively.

Mr. E. W. MacLean director of the Burrard Inlet Tunnel & Bridge Co., states that work will be commenced on the Second Narrows Bridge Vancouver in the spring and completed in eighteen months. The estimated cost of the structure is $300,000.

For surfacing concrete pavements at Ann Arbor, Mich., a mixture of tar and sand is used. According to the specifications of Mr. E. W. Groves, city engineer, as published in "*Good Roads,*" the pavement consists of a 5-in. bottom layer of 1:8 concrete and a 2-in. mortar surfacing. After the concrete has thoroughly set a thin coating of tar is spread on the street and before this is dry a coating of sand is applied.

At a meeting of the Metropolitan Park Commission at Montreal last week Sir William Van Horne and Controller Wanklyn submitted important plans for relieving the congestion of traffic in the city. In one case it was proposed to build a three-track tunnel under Cote des Neiges Hill to connect the portion of the city situated on either side of the mountain. The estimated cost of the latter project is placed at $1,000,000. The former plan would be considerably less expensive.

Difficulties of Modern Road Building

Evolution of the Best Construction—Some Notes on Surface Treatment—Selecting Materials on Basis of Merit and Cost*

By Charles W. Ross, Street Commissioner, Newton, Mass.

It is not my intention to criticise or find fault with the road builder, but merely to show what should be expected of him at the present time. In the first place, his work is always before you like a picture on the wall. He cannot cover up his mistakes. Experiments must be tried to obtain the best results. At present, there is nothing that can be termed perfect in the way of paving or constructing a street to take care of the traffic; we are looking for the best and while we may think that we have reached that point, we still find that such is not the case. I suppose our forefathers felt the same way fifty years ago, but the modern method of transportation is so different from what it was, that the requirements are entirely different. If we should undertake to build roads similar to theirs, we can readily see that we would be criticized severely by the public.

The people as a whole appreciate what is being done and also recognize the ability of experienced men and are looking for the best facts and opinions that can be obtained. If it were not so, this congress would never have been called, and other similar meetings that have been so beneficial would not have been required. I think the day is not far distant when we shall have reached a point in road building when it will be possible to answer all questions at a glance. If a person states the amount and kind of traffic over a certain road, the evidence should be in mind as to just what kind of treatment should be recommended. We may go still farther and say that our belief is that the horseless carriage is fast superseding the horsedrawn vehicle, and if it could be done at once, which we cannot yet hope for, the roads could be built to take care of the traffic much cheaper, and give better satisfaction to the public than by our combined system. They could be surfaced with a treatment either of tar, cement, heavy oil or any of the new preparations that have been tried that will withstand the traffic of the automobile and keep the dust down so that the road will be clean and in perfect condition every day of the year for the automobile. But when the roadway is expected to be used for the combination of automobiles and horse-drawn vehicles, the problem becomes more difficult, and every road builder will agree that the opinion of the chauffeur and driver should be regarded in deciding what kind of a surface shall be used in order to give perfect satisfaction for both. The treatments to be used for the various roads have never been determined, and until we can say that a certain road is to be used almost exclusively for automobiles, we cannot tell what kind of a surface to recommend; or if the road is to be used almost entirely for the horse-drawn vehicle, it is an easy matter to determine what kind of a treatment shall be used.

This year the State of Massachusetts, a census has been taken of the amount of traffic over different roads, and these figures show that on many of our roads more than one-half the number of vehicles passing over them are machines that are propelled by gasolene or some power other than horses. In many cases automobiles comprise three-quarters of the travel. Where these conditions exist the roads should be divided into different classes. For example, if the census should show that the whole number of vehicles passing over a certain road in twenty-four hours are vehicles propelled by gas or steam, the road would require an entirely different treatment from that required for one subjected to horse-drawn traffic passes over it, also the kind of traffic, the grade and traffic only. The road surface for an automobile can be kept free from dust, free from mud, in fact, a perfect surface every day in the year, but the surface that is required for a horse-drawn vehicle is apt to be more or less dusty or muddy —and will not withstand the traffic of the automobiles if they are run at the high rate of speed that they are at present. If the law were enforced restricting the speed of the automobile to not more than twenty miles an hour, it would be much easier for us to decide as to the kind of a surface treatment to put on a road. When the speed limit is exceeded then the trouble commences, and by every mile by which the limit is exceeded, the road is torn to pieces. In many cases we find our best macadam roads are becoming almost impassable on account of the loose stone, which makes them rough and very expensive to maintain.

I believe that the time is near at hand when we shall be called upon to build two types of roads. All the through lines or what might be termed "state roads" should be built to take care of the automobile traffic; the city street and those that are not used for through traffic could be surfaced with a different treatment. There are many dust-lying materials on the market at present that are perfectly satisfactory on a city street, but many of them are not fit to be used on the main highway, because the automobile, travelling at a high rate of speed, tears the surface off and leaves the road in a very bad condition in a short time. We are looking forward to the time when either the speed limit will be changed or the traffic divided into classes. At present, the question of proper treatment on different roads is very perplexing and is causing more discussion than any other subject that I know of. Many municipalities are at a loss to know how to solve this problem. This state of affairs cannot exist long because discerning people will soon learn the proper treatment and correct advice will be obtained from those who are capable of giving it.

Selection of Materials.

Because there are so many bituminous and asphaltic materials on the market at the present time and as each agent claims that his product is the best, it is pretty hard for any one to select the materials to adopt. My opinion is that they are all good under certain conditions and applied to certain streets. A treatment that will do one street may not do on another on account of the heavy traffic and other various causes that may arise. Taking these things into consideration, it is much better to obtain the services of a competent road builder or secure the advice of some one who has had practical experience in this line than to rely on the statement of an agent whose only desire is to sell his product.

During the twenty years that I have been actively engaged in this business, I have never seen the time when so many people visited our city, wrote so many letters, asked so many questions and inquired over and over again: "What can our city or town do to improve the roads and keep up with the automobile traffic"? I suppose that every road builder present has been through the same trials and tribulations. It is as hard a question to answer as it would be to have a man ask you how much it would cost to build a mile of road. It would depend altogether on the kind of road and the thousand other things that might enter into it. The amount of money that should be spent on a road depends entirely on how much the sub-soil. Knowing these, you can readily tell what kind of a surface to recommend and about how much it would cost per square yard.

---

*Paper presented at the Second International Road Congress, Brussels, Belgium.

Surface Treatment.

As I have already stated, the work of a road builder is on the surface. A man may build a sewer or drain, or in fact almost any other kind of construction; it is soon covered up and out of sight, but the surface of the street is visible at all times, especially in a rural city where people take so much pride in their private drives, walks and lawns. They require so much of the Street Department that it seems at times almost impossible to keep up to their requirements. We appreciate the fact that they are willing to pay for all they have and that they are only anxious to get the best they can, let it cost what it will. It is, therefore, no easy task to say what should be applied to the surface of a street unless you understand the conditions. For instance, a street of from eight to ten per cent. grade cannot safely be covered with asphalt or a bituminous paving, so that it will be perfectly safe for horses to climb in all sorts of weather and we are obliged to look, then, for a treatment that will fit these conditions.

We have found by experience that a heavy asphalt oil worked into the surface of the road prolongs the life of the road, makes it dustless, free from mud and is not likely to be slippery. One of the best ways that we have found to apply this material is to take a cubic foot of sand to a gallon of heavy asphalt oil, heat the sand to a temperature of from 150 to 175 degrees F., mix the oil thoroughly with the sand, spread it on the street with shovels and rake it with a fourteen tooth wooden lawn rake. In this way, we have not been obliged to roll the surface of the street, leaving the sand and oil to be rolled down by the teams. This has been tried more or less during the past two years, and has proved to be absolutely clean and we have not been obliged to close the streets at any time during the process of this treatment. It has proved very satisfactory and one treatment a year seems to be sufficient. After the first year, the expense is much less, as the material is worked into the surface of the road, making it nearly waterproof, and this for combined traffic has given very good satisfaction.

We have tried several of the different emulsions that are applied with water, such as terracolio, dustoline, calcium chloride and Speare's road binder. I do not intend to go into the detail of how they should be mixed and applied, as I believe the process is well known to everyone present. These have proved very satisfactory. We have also tried Tarvia A, B and X, the latter being a heavy binder, which has to be heated and mixed with the stone. All of these preparations have proved very satisfactory.

There are streets in almost every community which might be termed "gravel roads," that are used very frequently for pleasure driving. They generally lead through a rural district and are enjoyed by people riding horseback, also by ladies and children who like to drive on the soft, smooth surface. These should be kept free from dust in order to make them pleasing and agreeable. They may be treated with any of the lighter oils and preparations that are so well adapted for this purpose. In this way, it is evident that we cannot apply a hard and fast rule to all city streets as the conditions vary so much. Each street must be studied carefully to see the amount of traffic passing over it before any satisfactory report can be made.

When poor roads prevail in a section, everything is very apt to be poor, the horse, the farmer, the merchant and the church.

Importance of Road Improvement.

It is a well-known fact that in spite of the strenuous efforts made in some sections of our country to induce immigrants to settle in them, very few accept the invitation. They invariably post themselves pretty thoroughly about a section. This is made easy by the numerous emigrants who have preceded them and they are sure to have acquaintances in several sections who give them information. They very seldom locate in a place where the roads are impassable, as they do not wish to be mud-blockaded for six months in the year. In order to induce immigrants to come into such sections, good public roads must be made first. If it is economy that prevents, it is a false economy; every day that we allow our public roads to remain in an impassable condition, streams to remain without bridges, we deal a direct and severe blow at our own interests and the country will remain undeveloped. These roads, if improved at once, newly engineered, and made good roads, with permanent bridges that could not be swept away with every rise of the streams, would give some sign of permanence of settlement and of contentment with the section. The burden of the tax would soon be shared by so many that the roads would not only be self-sustaining, but would be a source of revenue to the state. The taxes would return in the improved condition of stock and running gear, and of the increased loads that could be sent to market in wagons. Circulation, which is the backbone of business, would be facilitated; where now it is a hazard and a task to venture on the public highways, then it would become a pleasure. But unless roads are made first-class to commence with, we will never have them, and we throw away the money we expend for them.

Winnipeg's Municipal Asphalt Plant

Some interesting particulars concerning the above plant are given in a recent consular report, which runs as follows:

"Winnipeg has a municipal plant, established in 1899, at a cost of $14,000. The first asphalt was laid in 1897, by contract, 7,314 square yards, at $2.35 per square yard, Trinidad Lake asphalt being stipulated. In October, 1898, tenders were asked for paving 17,801 yards on Portage Avenue, one of the city's principal thoroughfares. About that time the civic authorities deemed it desirable to establish a municipal plant, and the plant of the local company was purchased.

"Experimenting showed that the best mixture for wearing surface of an asphalt pavement was 10 to 12 per cent. bitumen, 78 to 85 per cent. sand, and 5 to 10 per cent. pulverized limestone. The various kinds of asphalt used have been Ventura, Alcatraz (small quantity), Obispo, Acme, Los Angeles, Trinidad Lake, Trinidad Land, Venezuela, and Bermudez. Trinidad Land, it is said, was found to be the least satisfactory. The asphalt for 1907-08 was bought from Venezuela, for 1909 from Mexico.

"The preparation for an asphalt pavement in Winnipeg is thoroughly made. The street is excavated 11 inches. Soft and spongy places are dug out and refilled with good earth well rammed. Curbing is laid on grades and lines given by the engineer in trenches of the required depth, filled with broken, coarse, macadam stone. Upon the sub-grade is laid a bed of Portland cement concrete 4½ inches thick, made by first mixing dry and then making into a mortar one measure of cement equal to the best quality of Portland cement and three of sharp, clean sand. The binder course consists of broken stone and asphaltic cement, about fifteen gallons of cement to one cubic yard of stone, the strone broken to three-fourths inch. The stone is heated by passing it through revolving heaters, and thoroughly mixed with the asphaltic cement. It is laid hot and rolled with hand and steam rollers.

"The average cost of paving the streets of Winnipeg with asphalt is about $2.30 per square yard. There are 58 miles of asphalt-paved streets in the city. During 1908 and 1909 extensive paving operations necessitated the maintenance of 125 men at the plant and 75 men on the street during the busy season."

Beams in "Genuine" Mill Construction

Toronto, November 12, 1910.

Editor, "Contract Record":

In your issue of November 9th I notice an article under the above heading by Mr. F. W. Dean, of Boston, in which he advocates the use of wood beams in preference to steel in mill construction. Mr. Dean must surely know that steel beams are preferable to wood when protected by porous terra-cotta, and that the floors, when constructed with the same material are also to be preferred to floors made of thick planking.

It is a well known fact that the insurance companies seek to encourage fireproofing material of porous terra-cotta, and will afford the lowest rate of insurance to buildings constructed in that way. It may not be generally known, however, that one or two inches of porous terra-cotta will protect steel from the fiercest fire. Those who are skeptical I would refer to the record of the Baltimore fire, where the damage was only about one per cent. With material of the right quality the damage would be nil.

Porous terra-cotta is the only material that ever withstood a 24 hours' fire and water test, therefore its efficiency and superiority are admitted by the highest authorities. In a building constructed of brick walls, with floors and roof of porous terra-cotta there is practically nothing to burn.

In conclusion I would add that porous terra-cotta is not only absolutely fireproof, but also more nearly sound-proof than any solid construction can be.

Yours truly,
Robert Bennett.

Municipal Reports*

A very large proportion of matter appearing in printed municipal reports represents a waste of public funds, inexcusable because done under the direction of supposedly intelligent men. A bare record of expenditures is deemed sufficient because men are prone to work along lines of least resistance. Your committee has had mailed to it the past year over 300 reports, and in very few have enough items of value appeared to warrant the editior of a technical paper in devoting his time to abstracting them. That is, few of them contain data of any value to technical readers, and, as presented, the reports are of extremely local value because they amount in effect to a recital of the amount of money received and the amount expended, the items being the items of bookkeeping. The greater number of reports are issued because the law requires such reports, and the work is done in a perfunctory manner. Illustrations are cheap at the present time and as common people like pictures the presence of half-tones and zinc etchings relieves the reports of extreme dryness.

In this the engineer and technical men alone seem to have been considered. The taxpayer says he is not engaged in the printing of free text books, a conclusion with which your committee is in accord. The only reply possible is, that if the report is of no value to engineers as a record of work done and a guide to the doing of better work in the future, then it is of no value to the man who pays for the printing.

Your committee is somehow of the opinion that the report of a city engineer should include information that will give the reader some idea of unit costs in water works construction and operation of sewage disposal plants, in the construction, paving and maintenance of roads and streets. The reports of superintendents of lighting plants as a rule are better than the reports of city engineers and street superintendents. While this is the impression of each member of the committee, and, strange to relate, is the impression of every man with whom the committee discussed the matter, the reports seem to attempt to avoid such data.

Upon diligent inquiry the committee believes that reports are insufficient mainly because reports are considered as additional work and not properly a duty of the official reporting them. The work is left to be done in the last few weeks of the outgoing administration and is hurried to an absurd degree. It is presented in a perfunctory manner as a gratuitous job, and finally, when every one has forgotten it, a wagon drives up to the City Hall with a load of printed reports just as rush night work has commenced on reports for the following year. The reports should be condensed and made valuable for the guidance and instruction of future officials and should be printed within at least three months after the date they bear. A number of reports were received this year following 18 months after the typewritten report had been presented to the Common Council.

Your committee believes that annual reports should contain some account of work of an unusual character which may have been done. A terse account of the difficulties encountered might be given with half-tone illustrations. Zinc etchings should be given of plans especially prepared to overcome the difficulties and a description of how they were overcome. Care must, of course, be exercised to prevent the report from dwelling too much upon common matters.

In many cities the office engineers in different departments have estimating tables or diagrams to assist them in preparing estimates of the cost of proposed work. Such tables and diagrams could properly appear in the annual report.

For the information of the general public, as well as of the men who will read the report for information as to methods employed in other places, there should be included a full-page diagram of the organization of the offices of the city engineer, street superintendent, sewer commissioner, water commissioner, etc. A graphic diagram is of wonderful assistance in guiding visitors to the City Hall to the proper office to obtain information or lodge complaints. An example of such a diagram is hardly needed in this report, as the members are familiar with their construction and they are in use daily in a number of offices.

Water Tight Sewer Joints

By John S. Stiger, City Engineer, Summit, N.J.

During the winter of 1909 to 1910 I had tests made to arrive at the amount of the ground water in filtration in the sewers of the City of Summit and found that in nearly all lines the amount was excessive. I at once had laboratory tests made of different jointing material to see if it was not practical to correct this trouble.

After several tests it occurred to me that as "Dip," which is manufactured by the Union Clay Products Co., made a good water proofing material, adhering well to cement or glazed surfaces, it should make a dependable joint when used on vitrified pipe, although it had never been used or recommended for any such purpose by the manufacturers.

I made a test joint on two three-foot lengths of 10-inch vitrifiable clap pipe which were joined together with the "Dip" and plugged at both ends; a pressure of twenty-two pounds per square inch was then applied to the interior without any leakage appearing at the joint.

But as we had made tight joints before with other materials I was not satisfied that the main cause of leakage from settlement after the trench was filled would be overcome by the "Dip"; I therefore subjected the joint made to another test, viz.: the pipe was set up on two end supports and a deflection of one and a half (1½) inches given to the middle (at the joint); the pressure under this condition again reached twenty-two pounds without any leakage showing at the joint.

I then had an analysis made by Dr. Stillman, of Stevens Institute, who reported that there were no ingredients in the

---

*Extract from Report of Committee on Municipal Data and Statistics to the American Society of Municipal Improvements.

"Dip" that would deteriorate by being buried in the ground or from the action of sewage.

After his report I decided to specify the use of "Dip" on all sewers laid this year, and the results obtained have been most satisfactory, as the following tests will show.

The first was upon 300 feet of 10-inch vitrified pipe on a six-tenths (.6) grade, in testing which the ends of the section were closed up and the trench allowed to fill with water. After twelve days of rainy weather there was seven feet of water in the trench and a gauge at the lower end of the pipe showed only 300 gallons infiltration, after standing for two days.

The second test was on 300 feet of 10-inch pipe which, after filling until the water was above the pipe and standing for one week, showed no infiltration whatever.

However, I do not feel that such good results would have been obtained with any material had I not departed from the old custom of having sewer inspectors, and put all contractors under a two-year guarantee for tightness of joint.

Before accepting the sewer, I have an inside water test made on all pipes, and the test will be repeated before the expiration of the two-year guarantee specified.

Technical Education Discussed at Winnipeg

Several prominent Winnipeg contractors gave evidence last week before the Royal Commission on Industrial Training and Technical Education. Among these were Messrs. W. H. Carter, of the Carter-Halls-Aldinger firm, J. W. Morley, Jas. Malcolm, N. Burgeault, J. J. Wallace, C. S. Shipman, R. Cotter and Edward Cass. Mr. Carter, president of the Winnipeg Builders' Exchange, stated that at the present time he was employing 600 men. During the summer he had 1,200. He always carried out a good deal of work in the winter, but thought that night classes at the Technical School would be attended by the men. Among the bricklayers Mr. Carter stated that his firm had only one apprentice, the rules of the union being that an employer could only take one apprentice every two years. Mr. Carter stated that very few men were being trained in Winnipeg, new men arriving continually from Great Britain, United States and Eastern Canada. The speaker alluded to the difficulty in obtaining good foremen. The average man offering for the position had not executive ability and did not understand plans. In the United States there were schools where men learned the building trade thoroughly from the ground up.

Mr. Burgeault made similar observations in connection with the stone-cutting industry. It took four years, he said, to learn the trade and an extra year for finishing. He had only one apprentice. All the new men came from Europe or the United States. In Great Britain the trade was apparently on the decline. The rate of wages had not increased for six or seven years.

Mr. Morley, representing the painting and decorating branch of the Winnipeg Builders' Exchange, said that the lack of apprentices in the city was due to the restrictions imposed by the unions and to the inefficient instruction given by the average employer.

Mr. Edward Cass, general contractor, gave it as his opinion that in such a strenuous country as Western Canada, men had neither the disposition nor the time to teach trades to others. Technical schools as established in Germany should provide the solution to the problem.

After this session the Commission left for Portage la Prairie.

Helmer & Winstanley, contractors, have just constructed at Coaticook, Que., what is claimed to be the second largest reinforced concrete bridge in the country. The largest is at Weston, Ont., illustrated in our issue of November 2.

Winnipeg Water Supply

The City of Winnipeg is considering the advisability of taking its water supply from the Winnipeg river. It is interesting to recall that in 1907 a board of consulting engineers comprised of Messrs. J. H. Fuertes, New York; R. S. Lea, Montreal; Geo. C. Whipple, New York, and J. E Schwitzer, assistant chief engineer, C.P.R., reported upon the various sources of supply, these being the Red river, the Winnipeg river, Shoal lake and the extension of the present system. The board based its report upon the needs of a city of 500,000 inhabitants. The engineers considered the Winnipeg river the most satisfactory and economical proposition. The following are the details of their estimated cost of this supply.

WINNIPEG RIVER WATER SUPPLY—COST OF CONSTRUCTION AS ESTIMATED BY BOARD OF ENGINEERS.

	For an Average Daily Supply of			
Items—	12,000,000 Gallons	24,000,000 Gallons	36,000,000 Gallons	48,000,000 Gallons
Land and right-of-way	$ [illegible]	$ 18,000	$ 18,000	$ 18,000
Intake works	150,000	150,000	150,000	150,000
Pumping station at Winnipeg river	325,000	465,000	740,000	1,015,000
Pipe lines	1,737,000	[illegible]	5,111,000	5,111,000
Coagulating basins	65,000	65,000	130,000	130,000
Filters	250,000	500,000	750,000	1,000,000
Filtered water reservoir	275,000	275,000	350,000	350,000
Winnipeg pumping station	370,000	615,000	[illegible]	[illegible]
Keepers' houses	12,000	12,000	12,000	12,000
Telephone lines	11,000	11,000	11,000	11,000
Tramway	150,000	175,000	150,000	[illegible]
	$ 3,358,000	$ 5,685,000	$ 8,342,000	$ 9,145,000
Add 15%	504,000	853,000	1,251,000	1,372,000
Totals	$ 3,862,000	$ 6,538,000	$ 9,593,000	$10,517,000
Using steel pipe lines	$ 6,050,000	$10,915,000	$16,159,000	$17,084,000

WINNIPEG RIVER WATER SUPPLY—COST OF OPERATION AS ESTIMATED BY BOARD OF ENGINEERS.

	For an Average Daily Supply of			
Items—	12,000,000 Gallons	24,000,000 Gallons	36,000,000 Gallons	48,000,000 Gallons
Interest	$ 171,000	$ 294,000	$ 432,000	$ 473,000
Depreciation	33,000	59,000	90,000	106,000
Pumping	83,000	190,000	240,000	[illegible]
Filtering	44,000	58,000	131,000	175,000
Maintenance of pipes, keepers' wages, etc.	12,000	19,000	29,000	29,000
Totals	$ 343,000	$ 620,000	$ 922,000	$ 1,103,000
Using steel pipe line	$ 468,000	$ 870,000	$ 1,292,000	$ 1,474,000

The estimate given for an average daily supply of 12,000,000 gallons is based on the laying of a single conduit with a capacity of 23,000,000 gallons a day to cover maximum requirements. This is detailed by the engineers as follows:

"The water would be brought from the Winnipeg river to the city of Winnipeg in three separate pipe lines, one of which would be built immediately, the second when the average daily consumption of water in the city would have reached about 17,000,000 gallons, and the third when the average consumption shall have reached 33,000,000 gallons daily. Each conduit would have a carrying capacity of 23,000,000 gallons daily."

In his report to the city council on October 22, 1910, in regard to the Winnipeg river project, the city engineer, Mr. H. N. Ruttan, recommended the installation of two pipe lines. Mr. Ruttan considers that the proportionate estimate of the board of consulting engineers for a daily supply of from 18,000,000 to 20,000,000 gallons would be $6,160,550. He concludes:

"Owing to the increase in cost of works since the date of the water commission's report and apparently low estimates of some of the items, for instance, the right-of-way and tramway, it would be prudent to add 10 per cent to the above estimate for the bond issue, making the total $6,776,605, say $6,800,000."

During the present season 12 miles of concrete sidewalk and 3¼ miles of permanent pavement have been laid in Ottawa.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested giving the main facts tersely.

Obstruction of Highway.—Breen vs. City of Toronto. Plaintiff attempted to cross a street diagonally, when he fell among some loose scoria blocks placed upon the boulevard by defendants to be used in repairing the street. Plaintiff broke his leg, and brought action to recover damages. It was held, that defendants owed no duty to plaintiff to leave the boulevard unobstructed by the blocks; that had plaintiff conformed to the city by-law prohibiting persons from walking on any boulevard where there were crossings, he would not have been injured. Action dismissed, but without costs.

Contract as to Party Wall.—Sterling Bank vs. Ross; Divisional Court of Ontario. Plaintiffs and defendants owned a party wall. By a survey of the town it was found to encroach 20 inches on the public street. The survey was sanctioned and permitted then existing buildings to remain until they were rebuilt. Defendant's building having been destroyed by fire she desired to rebuild, and the town council required her to conform to the statute. Defendant desired to remove 20 inches of the party wall standing on the highway in front of her new premises so as to enable her to extend the front of her new building across the full width of her lot. Plaintiffs asked for injunction to restrain defendant from interfering with said wall. It was held that the wall in question constituted an integral part of each building and could be maintained so long as either building is entitled to remain upon the highway. Injunction granted plaintiffs with costs.

Non-fulfilment of Contract Causing Death.—MacDonald vs. Walkerton and Lucknow Railway Company; Court of Appeal. Plaintiffs brought action to recover $5,655.45 balance alleged to be due on a contract to build a railway for defendants. Defendants pleaded that under the agreement it was the duty of plaintiffs to fill the narrow places between the rails at frogs, guard rails and switches with standard wooden blocks, and that, by reason of plaintiffs failing so to do, one Clarke had his foot caught in a frog and was run over and killed, and the defendants had to pay his legal representatives $5,250. Defendants paid into Court $405.45 as a balance due plaintiffs on their contract. At trial it was held that the action should be dismissed with costs, the money in Court to be paid out to plaintiffs.

The Court of Appeal reversed above judgment on ground that there was no liability upon plaintiffs to the Canadian Pacific Railway Company, for injury done to that company's servant. Judgment entered for amount of plaintiffs' claim with costs.

Preservation of Lien by Delivery of Materials.—Brooks—Sanford Hardware, Ltd., vs. Theodore Telier Construction Company; Court of Appeal. Plaintiffs brought action to have it declared that they had a lien for $325.92 upon the estate or interest of defendants, owners of certain lands, and for judgment against the contractors to whom they had supplied materials used in the construction of a building for defendants. The last delivery was within 30 days of the filing of the lien. It was 84 cents worth of expansion bolts. The action against the owners was dismissed by the Official Referee, who ordered that the lien registered against the lands should be vacated, but he gave judgment against the contractors for $325.92.

The Divisional Court allowed plaintiff's appeal against the owners of the land as the bolts were supplied to be used and were actually used in the construction of the building, and a lien therefore attached has no application in Ontario. A plaintiff's lien is not destroyed or prejudiced by taking a note and discounting it, and if the note is returned unpaid, the plaintiff is entitled to rely on the original accounts and file a lien for the amount of the note, as well as for goods supplied after the taking of the note.

The Court of Appeal reversed judgment of Divisional Court and restored judgment of the Official Referee with costs.

Merchanics' Lien.—Kelly Bros., & Company vs. Tourist Hotel Company. Plaintiffs. Plaintiffs sought to enforce a lien claimed for work done and materials supplied in building an hotel. Defendants, according to agreement, were to make payments each month, upon production of architect's certificate that such payments were due. Nine progress estimates were given plaintiffs by the acting architect, the last of which was dated 1st June, 1908. In February or March defendants refused to make further payments on ground that plaintiff had failed to furnish a satisfactory bond for the performance of their agreement. Pending the action the architect gave plaintiffs another progress certificate showing a balance due plaintiffs of $6,730.13.

The local Master at Kenora held that defendants were not justified in refusing to make further payments, nor were plaintiffs justified in discontinuing their work. He gave plaintiffs judgment for amount certified due on 1st June, after deducting payments on account and $991 for insurance on hotel after 1st January.

The Divisional Court varied the judgment of the Master by increasing plaintiffs' judgment by $991, the amount of the insurance and added to the judgment an order that any surplus which might be realized by sale of the hotel, after payment of sums directed to be paid out of the proceeds, should be paid into Court subject to further order, and reserving leave to plaintiffs to apply in respect of the lien.

Dispute Over Changes in Plans.—Smallwood vs. Powell; Court of Appeal. This was an appeal by defendant from a judgment in favor of the plaintiff contractors in an action to recover $1,470 for work claimed to have been done for defendant in the erection of a house and stable and for a declaration of a lien on the defendant's lands for that amount. Defendant undertook to pay 75 per cent. fortnightly on account of the contract as the work proceeded, the balance of contract and extras to be paid within thirty-three days of the completion of the work. The plaintiffs were to carry out the work to the satisfaction of the architects, and subject to any changes required. A clause in the contract gave the defendant or his architect the right to make such changes. The court held that if the work was to be done under the direction of the architect, the contractors would not be fulfilling their contract if they refused to make the changes required. Another matter referred to was that part of the contractors' claim was on a progress certificate for $200. "It is expressly declared," said Mr. Justice Magee in his finding, "that such certificates in no way lessen the total and final responsibility of the contractor nor exempt him from liability to replace work if it be afterwards discovered to have been badly done or not according to the drawings and specifications either in execution or materials. That, of course, does not touch the question of his exemption after a final certificate, but when we find that the final certificate is not itself necessary nor conclusive, the provision I have alluded to goes to show that thorough performance of the work was what the parties had in mind and the contractor was not to escape through temporary non-discovery of inferior work." The Court of Appeal ordered a new trial with costs of former appeal to defendant.

Retention of Contract Money by Municipality as Security for Repairs.—Manufacturers' Lumber Company vs. Pigeon; Divisional Court of Ontario. The fund sought to be made available by the judgment creditor was $1,360, held by the City of Stratford under terms of a contract for paving. The work had been completed, but under the contract the contractor was bound to maintain the work in good repair for a specified time. In default of his doing so, the city could make the repairs and charge the cost to the contractor. Judge Middleton held that under the reading of the contract the work was not completed, and that therefore the contract money was not attainable. The finding concluded as follows:

"The fact that the bulk of the work is done and that what remains to be done is only an insignificant part of the whole, makes no difference. Though in one sense the greater portion of the money has been earned as a matter of law, none is earned until all the work is done. This case comes very close to the line and it is hard to say with certainty upon which side it falls. I have come to the conclusion that the money is earned and has been pledged by the contractor as security for the performance of his contract to maintain and repair the work. This, it seems to me, is a contract collateral to the construction contract, and the price to be paid is the price of construction only and not of construction and maintenance. The maintenance is by way of warranty of the quality of the work and is to be done gratis for the period named."

Alleged Negligence in Collapse of Building (Crystal Hall Disaster).—Earl vs Reid. Defendant owned a four-storey brick building, comprising two premises on Dundas street, London. As originally constructed a brick wall about 17 inches thick divided the two premises from foundation to roof. Many years ago three arch-shaped openings were made in the section of this wall which divided the ground floor, for the purpose of converting the two stores into one. Subsequently these openings were closed by defendant, not by restoring the solid brickwork, but by a wall about four inches thick on either side, on a line with the surface of the original wall, leaving a hollow space about eight inches wide between the two. In April, 1907, Reid entered into a twenty-five year lease with one Smyrles, who agreed to make certain alterations and improvements to the building at his own expense. One of the alterations indicated on the plan was the removal of between fifty and sixty feet of that section of the wall above referred to which divided the first floor of the main building into two compartments, and the substitution therefore of three iron columns supporting steel beams against the wall above and resting on plates 13 or 14 inches square imbedded in cement on top of the wall below.

Smyrles engaged Kernohan & Wilson, a firm of contractors who were also defendants in this action, to do the work, but the contract between them did not appear in evidence. The work of putting in the steel beams and iron columns was completed on July 12th, 1907, and either on that day or on July 15th, the shoring which had been used to support the wall until the columns were in place was removed.

The easterly wall of Reid's building was an outside wall and faced on a line which divided it from the building of one, Brewster, in which the plaintiff was on July 15th, 1907, employed as a clerk. On the afternoon of that day, as described by the witness, Hammett, Reid's building went down in a wedge-shape in the centre and crushed out the walls, and the easterly wall fell against Brewster's building crushing it in, whereby plaintiff received the injuries for which he sued sued.

Other than proving the existence of the openings and the method of supporting the superstructure of the wall by the beams and columns, and the fact that the first indication of the impending fall was the crumbling down of some bricks in the easterly half of the ground floor from the angle formed by the ceiling and the division wall, which was instantly followed by the collapse of the wall as described by Hammett, the plaintiff gave no evidence to account for the accident. No expert evidence was given to show that to do the work in the manner indicated on the plan, having regard to the three openings filled up in the manner described, would injure the stability of the wall, nor was any witness called to prove any specific act of negligence by defendants or those doing the work.

It was found in the first instance that the plaintiff's injuries were caused by defendant's negligence in placing the iron columns on a defective wall, and the damages were assessed at $500. The Court of Appeal gave defendant the right to appeal on his undertaking to pay costs of such action. The following principle laid down by the court is of interest:

"A man who orders a work to be executed, from which in the natural course of things injurious consequences to his neighbor must be expected to arise, unless means are adopted by which such consequences may be prevented, is bound to see to the doing of that which is necessary to prevent the mischief, and cannot relieve himself of his responsibility by employing someone else—whether it be the contractor employed to do the work from which the danger arises or someone else—to do what is necessary to prevent the act he has ordered to be done from becoming wrongful."

City Creosoting Plant at Victoria, B. C.

Mr. Angus Smith, city engineer of Victoria, B. C., has reported as follows in connection with the city creosoting plant:

There is a reservoir under the floor of the plant approximately fourteen feet square and twelve feet deep, into which the creosote is emptied from the barrels or drums or tank cars. The creosote is pumped from this reservoir into a large tank on the second storey of the plant and is there measured. The creosote is then drawn from this tank into a large cylinder which contains the cars of blocks. The creosote is there heated to between 212 and 220 degrees, and the water is evaporated from the blocks. Afterwards sufficient pressure is given to force the creosote into the blocks. The time given to the treatment of a batch is approximately four hours.

In June it was discovered that the large reservoir was leaking and it was decided to line this reservoir with steel lining one-eighth of an inch thick, which was accordingly done. There was a space between the steel lining and the old walls of the reservoir three inches wide. This was filled in with concrete in the proportion of one part of cement to three of sand, the idea being to prevent the creosote from seeping through any fissure that might be in the rocks. Soon after the first rain it was discovered that water was seeping into the reservoir where the steel was rivetted together and soon afterwards the weight of the waterback of the lining bulged the steel lining inwards. The lining was put back in place and the leak was repaired as well as could possibly be done. The plant seemed to go on without difficulty until the next heavy rain when water again found its way into the reservoir. It is quite possible that the concrete filling at the back of the reservoir has closed up the old surface water outlet in the crevice of the rock. Otherwise the water would be drained away and not rise five or six feet in height between the lining and the concrete.

The creosote that is used in the treatment of the blocks is carefully measured in the upper tank so that the amount actually used in the treatment of a batch is definitely deter-treated. The city has on hand 641 drums or 56,160 gallons of creosote. The average creosote used per thousand blocks of 74 gallons. The city has on hand sufficient creosote to treat 759,000 blocks or 14,300 square yards of pavement. I estimate that it will take 10,000 square yards to complete Douglas and Yates streets.

An order was given for creosote from England early in the spring, which has just arrived this month. A number of cars of creosote were brought from Sidney to keep the plant going until the arrival of the drums.

Attached herewith is a statement showing the blocks treated, the creosote used, the cost of labor, the cost of the creosote, and the total cost for labor and treatment per thousand blocks, the average cost per thousand blocks is shown in red and varies from $13.58 to $19.86.

The cost of block pavement costs approximately as follows:

Costs of blocks	$78.18
Cost of creosote	65.45
Treatment and labor	14.87
Total cost	$158.50

The number of blocks treated per week varies from 18,500 for the week ending June 25th, 1910, to 141,180 for the week ending October 22nd. The number of men employed averages from six to eighteen.

Late Building Season at Ottawa

Activities of the Ottawa Improvement Commission—Prospects of New Industries—Little Change in Supply Market

Ottawa, November 12, 1910.

The work of the Ottawa Improvement Commission is continuing later than usual this year, owing to the favorable weather. It has accomplished, if anything, more work than in any previous summer. From 125 to 135 men have been employed all the summer. The wages paid ranged from $1.75 up to $2 for laborers, and mechanics the regular prices. The commission has its own quarries, its own lands from which to take sods, its own crushers, etc. Mr. A. Stuart has charge of the work. The commission uses a large amount of cement, which it bought from the local firms for $1.82 per barrel. During the year the commission built over two miles of driveway, besides a number of ornamental bridges. The beautifying of Nepean Point was an extensive work, carried out this season. Next year it is probable that there will be even more work on hand.

"The city has practically completed its street paving and sidewalk construction for the year. The Barber Asphalt Company and the Ottawa Construction Company are finishing up their contracts.

There are a number of industries negotiating with the object of locating in this city, and there is every indication that some of them will begin building plants this winter or early in the spring. J. H. Henderson, of England, has purchased property in the city to erect a factory for manufacturing hair cloth. A structural steel and iron works are reported to have closed an option for 6 acres in the city limits on which to locate a plant. A fibre board company of New York, a Detroit automobile industry, a pump industry and a biscuit company are negotiating with Publicity Commissioner Baker, with the object of locating in this city.

The Cummings Lumber Company, of Kazubazu will build a planing mill and sash factory in Westboro', and other companies are making investigations.

The final survey on the Morrisburg and Ottawa Electric Railway line has been made and the options for the entire right of way have for the most part been taken. The officials expect to begin construction early in the spring.

A large number of foundations for dwellings are being put in before the frost becomes too severe. Lime is selling at 33 cents per cwt. in lots of over two tons, and for lots under that, at 35 cents. Sand is being delivered in all the central parts of the city at 95 cents per cubic yard, washed river sand is sold on the wharf for $1.00 per load of two cubic yards.

Canadian Railroad Development

Andrew McGinnis, contractor for five miles of the Canadian Northern through and to the west of Belleville is now working 80 men and 24 teams, and if the weather is favorable expects to complete grading early in December.

The Canadian Northern Railway has been granted permission to construct a subway at Cobourg, Ont. The Grand Trunk Railway is also to construct a subway. The subways will be where the railways cross Division street and about 600 feet apart.

David McBeth, according to advices from Nelson, B.C., has taken a sub-contract on the Kettle Valley Lines for the clearing of the right-of-way between Rock Creek and Beaverdale, a short distance of about 25 miles. He expects to have the work completed by March 1 next.

Advices from Rock Creek, seven miles north of Chesaw, Wash., state that a crew of construction men have started work on the extension of the new railroad westward from Midway, B. C., to the coast and several miles have already been graded. It is believed that the Canadian Pacific is interested in the project.

A. C. Mackenzie has started grading operations on the Morinville east branch line of the Canadian Northern Railway. The line will run east from Morinville, but as yet it has not been decided just where it will connect with the main line. In all probability a town on the line in the North Battleford district will be made the junction.

The Toronto & Eastern Railway Company, recently chartered, has been financed and has completed its survey for its projected lines and is arranging preliminary matters so that construction work can be started in the spring. The road is to run from Toronto to Cobourg, with extensions of the system from Port Hope to Peterborough, from Oshawa to Lindsay, and from a point in the township of Scarborough to Uxbridge. R. H. Rothray, of Toronto, has recently been appointed superintendent of the line.

Engineers in the employ of Mackenzie & Mann, Toronto, are going over the proposed route of the Alberta & Great Waterways Railway, with a view to estimating the probable cost of constructing the line and the securing of the best and most direct route to Fort McMurray. This leads to the belief that the Canadian Northern interests will take over the Alberta & Great Waterways Railway project and will build the line for the Provincial Government, and in all probability either buy it outright from the Government or else operate it on a long-term lease.

The Laurent, Jacques Cartier & Maisonneuve Railway Company has submitted a plan to the Railway Commission to construct a railway line in and near Montreal. The company proposes to build its line from the junction of St. Laurent avenue and Cartierville avenue, in St. Laurent parish, through the north end of the city, ending at St. Catherine street, between Frontenac and Harbor streets. Part of the line will follow Iberville street. This line is really a branch of the Grand Trunk Railway System, and is intended ultimately to connect the eastern and western terminals of the system in the city. The G. T. R. proposes to build an east end station with docks and wharves. At present only a freight shed has been erected in the east end, but the company is now laying this line, which will connect the two stations.

According to a despatch from Edmonton, Alta., a new construction company is being organized to take over all the work on the main line of the C. P. R. west from Edmonton to the British Columbia side. Mr. J. McKenzie, son of the president of the C. N. R., and Mr. C. J. Merry, of Winnipeg, are prominently identified with the enterprise. For some time past Mr. Merry has been connected with the Cowan Construction Company, which has been doing a considerable amount on C. N. R. work in the west. Should this new company take over the construction, they will work west to the mountains, meeting the Northern Construction Company's gangs, which are now working north from New Westminster and Kamloops. The McMillan Company, of Winnipeg, is now under contract for the first seventy miles west of the city, but it is understood that the new company may take over construction next year.

It now looks as though the Toronto-Ottawa branch of the Canadian Northern Railway would not be ready for operation before next summer. Good progress has been made on the grading work and this will be completed nearly on contract time. The principle delay, however, has been in connection with the bridge work, and this is said to have been due to slow delivery of steel. The bridge work began at the junction point in the Don Valley, where this line branches off the Sudbury branch for the east, for the Don river had to be spanned. This was only a small problem and was soon completed. In the meantime the grading eas had been completed to allow of the rails being laid on to the next gulley, which was at the Rouge river. There are two forks to this stream. The western, 19 miles from the union station at Toronto, made necessary a steel viaduct with concrete abutments, 500 feet in length. The eastern fork called for a span only 180 feet long. There was only one cutting that could be called big in the ground work along this mileage, where the road crossed under the Grand Trunk Railway at Scarborough. The steam shovel work there was extremely heavy. But the completion of this and the throwing over of the steel made it possible to lay the rails down east almost to Bowman's creek, which is situated north of Bowmanville. Here was another viaduct, though a small one. But a little farther on came the Dixie Creek gulley, which entails a viaduct of 850 feet in length. This one is not yet built. Beyond it again there is another at Stephen's Mill Pond, which is a span of 650 feet, also not constructed as yet. It is about 56 miles from the Union Station. From there the line continues on and down to Port Hope, where there is a span to be thrown of 2,000 feet in length. The grading from Cobourg to Trenton is practically all finished, and the steel laid, except a small piece near Brighton, where there is still some work to be completed. The engineers hope the grading will be finished by the new year, and that by the end of January all the steel viaducts to Trenton will be in place. Ballasting has been done on a good portion of the line, and it is expected this work can be proceeded with in the winter and be finished in the early spring.

A meeting of the Ottawa branch of the Canadian Society of Civil Engineers will be held at 177 Sparks street on November 16, when Mr. D. H. Nelles will address the members on the subject of the International Boundary Survey. Mr. H. V. Brayley is secretary of the branch.

Building Inspector Chausse, of Montreal, has approved plans for a ten-storey office building to be erected on St. Francois Xavier street, at a cost of $1,000,000. Messrs. Ross & MacFarlane, of Montreal, are associated with Messrs. Carriere & Hastings, New York, in the architectural work. Peter Lyall & Sons have the contract.

Personal News and Notes

Victoria, B. C., is considering the advisability of appointing a supervising engineer for the city.

Mr. J. M. Wilson, city engineer, of Moose Jaw, has returned from a trip through Eastern Canada.

Mr. T. Aird Murray has been invited to report upon a new water supply for the town of Pembroke, Ont.

At Toronto the Civic Improvement committee have recommended the appointment of a local architect to prepare plans.

Robert Tracey, of High River, Alta., a well known contractor, formerly of St. Mary's, Ont., was thrown from his horse last week and died later from his injuries.

The new post office at Edmonton was opened last week after lying idle for over six months, although practically completed. It is stated that the delay was in interior finishes ordered from England.

The building by-laws of the City of Montreal are to undergo a thorough revision. The Board of Control has recommended the engagement of a sanitary engineer and steel expert in this connection.

Building permits issued at Vancouver last month represent a total value of $1,286,995. The total for the ten months of the current year is $10,298,355, an excess of more than $3,000,000 over the total for the whole of 1909.

The Chateau Laurier Hotel, at Ottawa, is beginning to assume a finished appearance. Good progress has been made in the concluding stages of this work. The building will be completed and handed over to the Grand Trunk Railway next season.

We regret to note the death of Mr. Jos. Greenfield, one of the oldest and best known architects in Winnipeg, and for the past six years superintendent of public works in that city for the Dominion Government. The late Mr. Greenfield was born in Croydon, Eng., 65 years ago.

The Civic Improvement League of Halifax, N. S., at a meeting held last week decided to ask the members of the city council for their co-operation in the appointment of a permanent commission, and the securing of expert advice in providing a comprehensive plan for the development of the city.

Mr. C. E. Cartwright, of Vancouver, and Mr. A. J. Matheson, formerly of Ottawa, have formed a partnership as general consulting engineers. Mr. Matheson has reported on a number of important matters for the Dominion Government. Formerly he was division engineer on the Georgian Bay Canal Surveys.

Mr. Rudolph Hering, consulting engineer on the disposal system, now under construction at Toronto, paid a visit of inspection to that city last week. The local press recalls the fact that it is just a quarter of a century ago since Mr. Hering was first retained by the city, and that it was at that time that he recommended the work now in progress.

The Ottawa city council is expected to appoint an expert engineer to report in conjunction with the city engineer on the C. P. R. tunnel scheme now under consideration. The following names have been mentioned: Hugh Lumsden, (Ottawa); W. F. Tye, (formerly chief engineer for the C. P. R.) and Walter Shanly, (Montreal.)

Extensive paving work is projected at Winnipeg and City Engineer Ruttan is looking for pointers on the most satisfactory material. When in Port Arthur recently he inspected a surface application, known as "[illegible]." It is interesting to note that an experimental [illegible] pavement has been laid on Ellice avenue, Winnipeg, [illegible]

Garry to Smith streets. The experiment was made on behalf of the inventor, by Mr. C. W. Sharpe, chairman of the Winnipeg Parks Board.

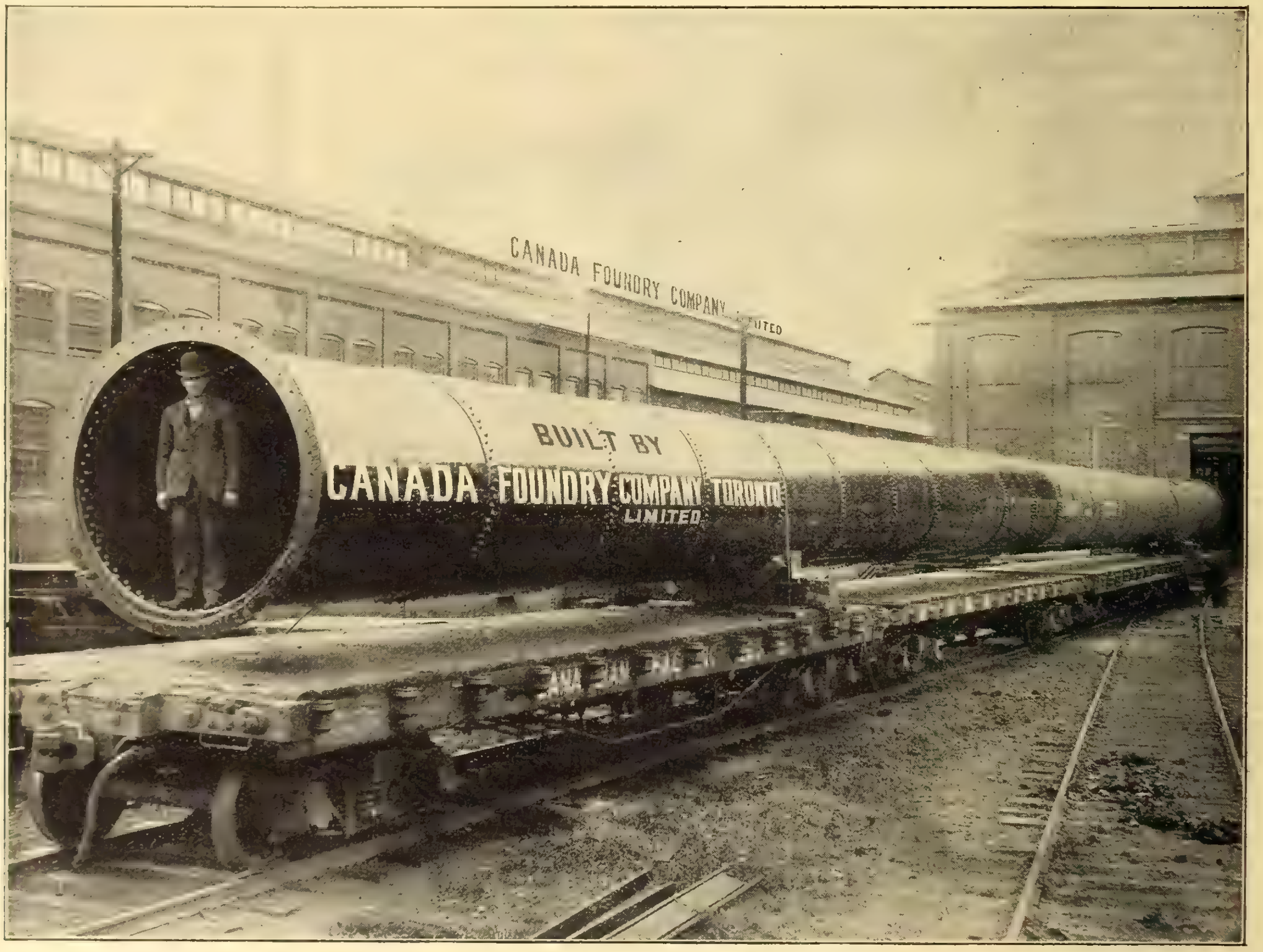
Mr Geo. C. Rainboth, one of the best known land surveyors in the country, died last week at the age of 64 years. He had been in charge of the Canadian survey party working on the international boundary line between New Brunswick and Maine. He was a Dominion land surveyor, and was also registered in the provinces of Ontario and Quebec.

The death occurred at Montreal last week of Mr. Jno. Watson, president of the firm of Jno. Watson & Son, Montreal, architectural iron workers. The late Mr. Watson was born in Greenock, Scotland, and was 57 years of age. He was prominent in local military circles, having been sergt.-major of the Prince of Wales Rifles for many years. He held both the long service and Fenian Raid medals.

November 4th was the 89th anniversary of the birth of Mr. T. C. Keefer, C.E., of Ottawa. Mr. Keefer was educated at Upper Canada College, Toronto, and at the age of 17 years first essayed engineering work, being employed for a time on the Erie and afterwards on the Welland canal. From 1845-48 he was chief engineer on the Ottawa river works. In 1849 he gained Lord Elgin's prize for the best essay on "The Influence of the Canals of Canada" on Her Agriculture, and about this time published his "Philosophy of Railways." In 1849 Mr. Keefer was placed in charge of the surveys for navigation of the rapids of the St. Lawrence and in 1850 assisted the United States consul in preparing a report on Canadian trade with the United States. In 1852 he went to New York to assist with a second report on the same matter, these reports leading ultimately to the reciprocity treaty of 1854. It is of interest to recall that it was under Mr. Keefer's direction that the Ottawa waterworks were built. He also constructed waterworks for the cities of Hamilton and Montreal. Mr. Keefer was also prominent in railway work, making preliminary surveys for the Grand Trunk Railway and for the railway bridge over the St. Lawrence at Montreal, and acting for some time as chiew engineer for railways in Upper and Lower Canada.

Canada Foundry Company's Large Contract

The accompanying illustration shows a section of the new intake pipe for the city of Toronto recently made by the Canada Foundry Company, Limited, this being about one-third of the total 500 feet length. The pipe is 72 inches inside diameter and each section weighs approximately 45 tons. The section shown is interesting from the point of view that it is the longest section of pipe ever turned out by the Canada Foundry Company. Having been made in a Toronto shop, it was possible to use fewer sections than would be possible if it had to be shipped any distance by rail. This pipe is now being placed in position by the city engineer's staff.


CANADA FOUNDRY COMPANY LIMITED
BUILT BY
CANADA FOUNDRY COMPANY TORONTO
LIMITED

Section of new Intake Pipe made by the Canada Foundry Company for the City of Toronto.

At the convention of the Union of Manitoba Municipalities, which is to be held in St. Boniface during the latter part of the present month, one of the most important matters to be discussed is proposed legislation looking to the improvement and construction of roads. A number of important recommendations will be made in this connection by the Manitoba Good Roads Association.

Smokestacks

We can build them quick of the right quality and at the right price.

Boilers

Do you need a boiler? Let us quote you. We guarantee our Boilers and stand behind our guarantee.

Steel Tanks

We make all sizes and shapes for water, oil or anything else. We make them right and tight.

We have the facilities for manufacturing these goods quickly and in the best manner. We will be glad to quote.

Marsh & Henthorn, Limited
Belleville, Ont.

"The durability of a building is the gauge of its value from an economic standpoint."

—The Philosopher of Metal Town

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality OLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1955

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

FOR CONVEYING AND TRANSMISSION

Scandinavia Belt is considered the best Conveyor Belt that has ever been put on the market, for conveying Ore, Rock, Cement, Clay, etc.

It is not made in plies, and will not come apart.

Equally good in wet and dry places.

This illustration shows 20" Extra Stout Scandinavia Belting for conveying Cement.

Write for Bulletins, price lists, and discounts.

Federal Engineering & Supplies Limited

284 Yonge Street, TORONTO

AGENTS: Power Economics Ltd., Montreal. McDougall Hardware Co., Ottawa.
Marks-Clavet-Dobie Ltd., Pt. Arthur. Great West Saddlery Co., Calgary.

Agents Wanted in Other Cities.

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y. -	71 Broadway
Baltimore, Md. - -	Continental Trust Bldg.
Boston, Mass. - - -	70 Kilby Street
Chicago, Ill. - - -	Western Union Building
Mexico City, Mex. -	Edificio de "La Mutua"
Philadelphia, Pa. - -	Morris Building
San Francisco, Cal. - -	1505 Chronicle Building
St. Louis, Mo. - -	Commonwealth Trust Building
London, England - -	110 Cannon Street
Steelton, Penna. - -	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. [illegible]

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

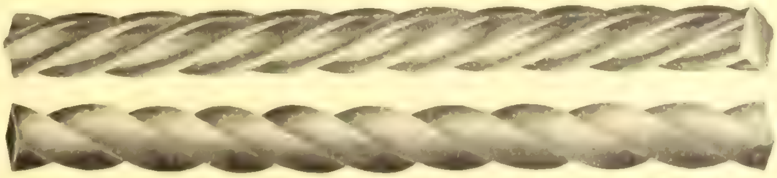
Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing. Also [illegible] soft steel rounds.

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. Suburb of Buffalo N. Y.

Toronto Office
117 Home Life Building

The Original

MARSH - PAUL AIR VALVE

Guaranteed for Five Years

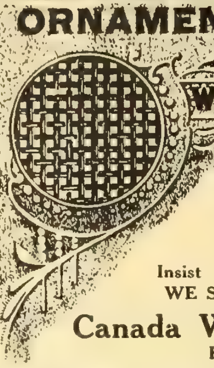
Our Air Valve Catalog describes this Valve and others of our manufacture also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS



Do not overlook the protection of your windows and security insured by installing our WINDOW GUARDS

Insist on having HARD STEEL WIRE

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone Company, Guelph

from the hardest substances available

Write the

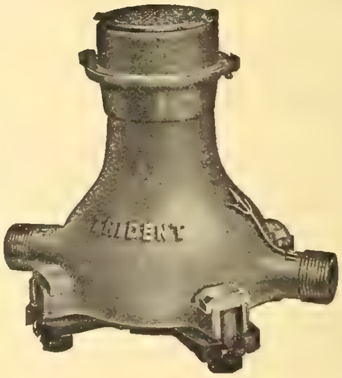
Corinthian Stone Company

G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known



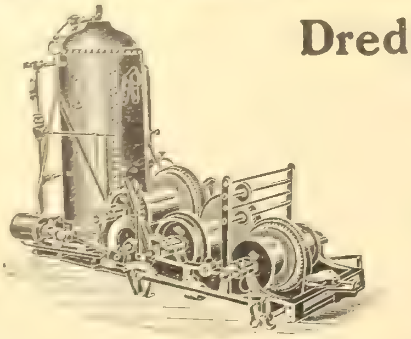
TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada



Dredges - Ditchers - Derricks

Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Harry Allen Jacobs
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of absorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.
Limited

Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Established 1882

THE COMMERCIAL

The Weekly Financial Commercial & General Trade Newspaper of the Great West.

Winnipeg Manitoba

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457

HEAD OFFICE :
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL.

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

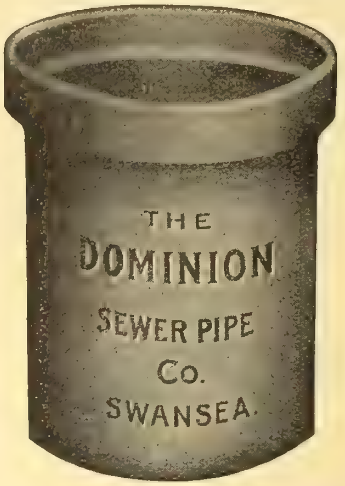
Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

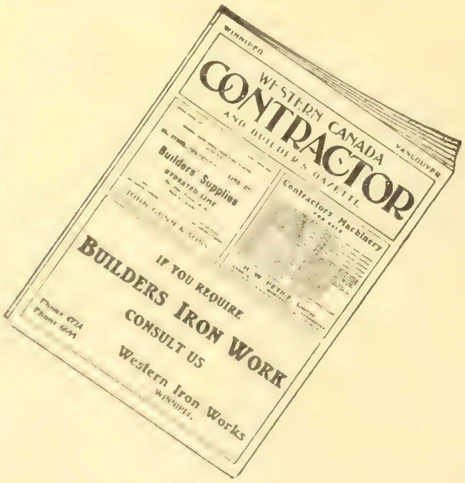
also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.


WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDERS GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American Sewer Pipe Co.

General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed
Sewer Pipe
in the WORLD

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:

201 Devonshire St., Boston, Mass.

J. H. NEW,
President.

R. H. NEW,
Vice-President.

The Most Satisfactory Sewer Pipe that is being offered to Canadians

We aim "and our aims are realized" to make the best line of Vitrified Salt Glazed Sewer Pipe that is being offered to the Canadian trade. The consumers, contractors, corporations and dealers throughout Canada mostly prefer our product, quality being their first requirement. Then, too, we pay special attention to inquiries.

Prices, and last, but most important, "DELIVERY"

You simply cannot afford to buy elsewhere

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"Best Paving Block Made"

Daily Capacity 500,000

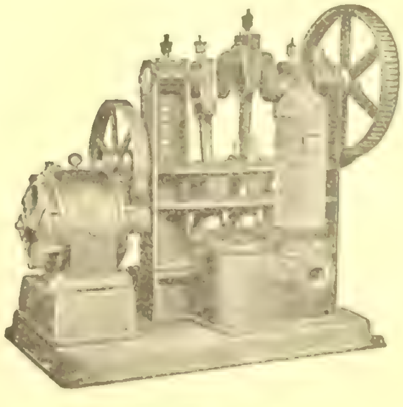
Every time "**Metropolitan Block**" are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.
Coristine Building, Montreal
Phone Main [illegible]
Works: Seneca Falls, N.Y.

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

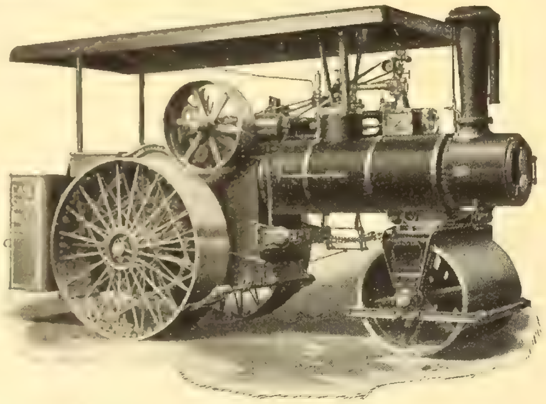
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis.. U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy

or any kind of

Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

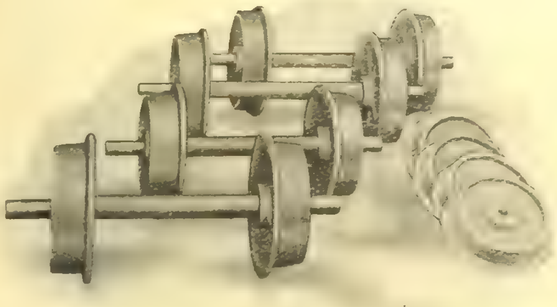
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. **Three Rivers, Que.** **St. Thomas, Ont.**
Hamilton, Ont. **Midland, Ont.** **Fort William, Ont.**
Londonderry, N.S.

Dundas Stone

All Sizes—For Concrete Road-work
and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE AND FITTINGS.

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridges' Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 26-27, Flack Block, **Vancouver, B. C.**

JAMES TAYLOR

Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage
and Electric Lighting.**

Toronto and Winnipeg

John Galt John Haddin

Reid & Brown

**Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock**

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

Queen City Foundry Co., Ltd.

Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.
67 Esplanade E.,
Phone Main 7692 **Toronto, Ont.**

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

**Building Granite, Granite
Setts, Curbing, Etc.**

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
124 St. James St. **Montreal**

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 “	4.65	6.75
41 to 50 “	5.10	7.50
51 to 60 “	5.35	8.50
61 to 70 “	5.75	9.75
71 to 80 “	6.25	11.00
81 to 85 “	7.00	12.50
86 to 90 “	....	15.00
91 to 95 “	....	17.50
Brass Goods, Valves, etc.		
96 to 100 “	....	20.50
101 to 105 “	....	24.00
106 to 110 “	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 8 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 8 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.
High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

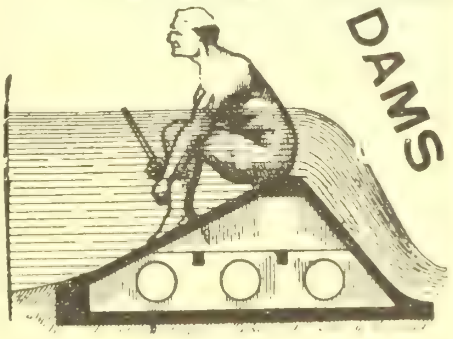
(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, $1.05 per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The Brush Electrical Engineering Company, Limited, of London and Loughborough, one of the leading engineering concerns in England has established a branch through the Canada Ford Company, Canadian Express Building, Montreal, who will handle all their well known manufactures, including steam turbines, high speed engines, electric generators, motors, transformers, electric lamps, fans and other apparatus, steam and electric locomotives, and street car and underground rolling stock.

NADEL & ADLER
375 St. James St., MONTREAL
The Largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars. Main [illegible]. Night calls Main [illegible], or St. Louis [illegible]

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
The KATIE Foundry,
Galt, Ont.
Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished
References Given

New Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's Cement.

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

The
"Simplex" Stone and Marble Cutter

This tool is furnished with adjustable blades for both freestone and marble, the blades being replaced when worn. The new blades are cheaper than sharpening the solid tools and save a lot of trouble. They give perfect satisfaction. We also supply double tooth cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S.

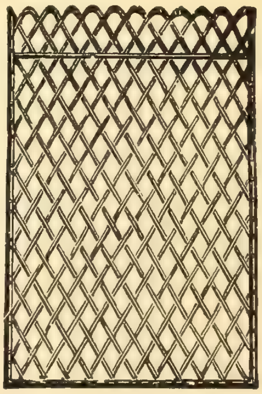
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

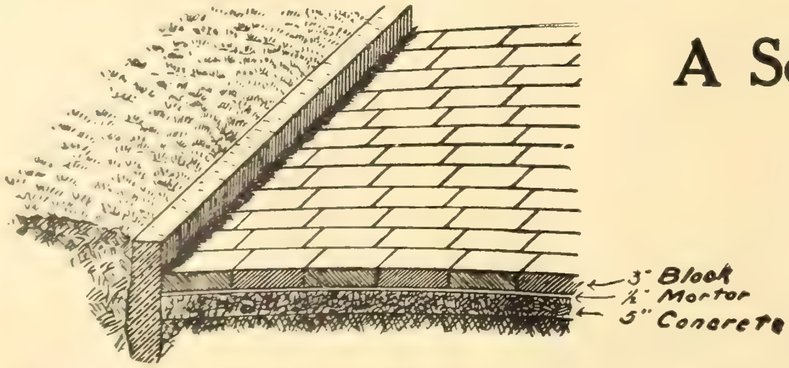
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

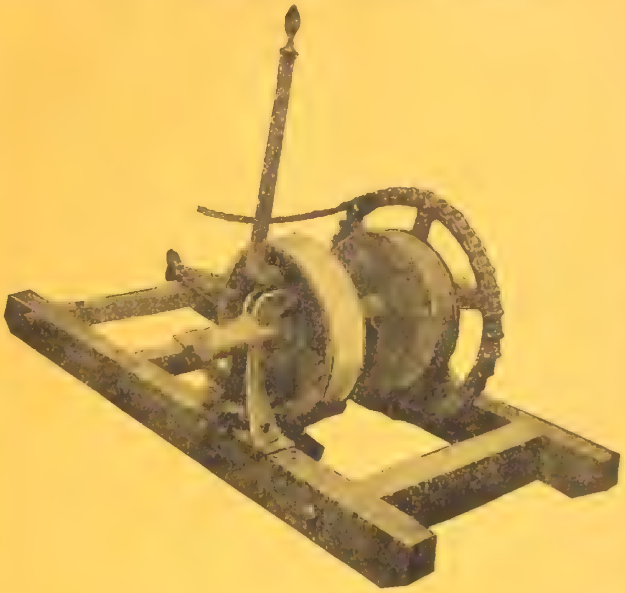
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited

Engineers and Machinists **London, Canada**

Builders' Joist Hangers

ALL SIZES AND STYLES

Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited

GUELPH, ONTARIO

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills Limited

Midland, Ontario

"Kilindo" Wire Rope is absolutely free from any tendency to rotate with or without the load.

"Kilindo" Wire Rope does not kink. "Kilindo" Wire Rope is constructed of wire of a round section.

"Kilindo" Wire Rope is less liable to the crushing action which takes place in other ropes.

"Kilindo" Wire Rope is the only rope built of round wire which can be made Langs Lay, and yet be perfectly non-rotating.

"Kilindo" Wire Rope can be supplied in all sizes and in all lengths.

Kilindo WIRE ROPE

·MANUFACTURED BY·
THE DOMINION WIRE ROPE CO. LIMITED
·MONTREAL·

We have gone to considerable expense in equipping our plant so as to turn out this new cable to the very best advantage and therefore solicit your kind enquiries when next in the market for Hoisting Cables for Derricks, Cranes or other services.

We carry a complete stock of wire ropes for every purpose, also everything in the way of fittings, such as Blocks, Clips, Thimbles, Turnbuckles, Shackles, Sockets, Hooks, Sheaves, etc., etc.

Write us for prices and full particulars.

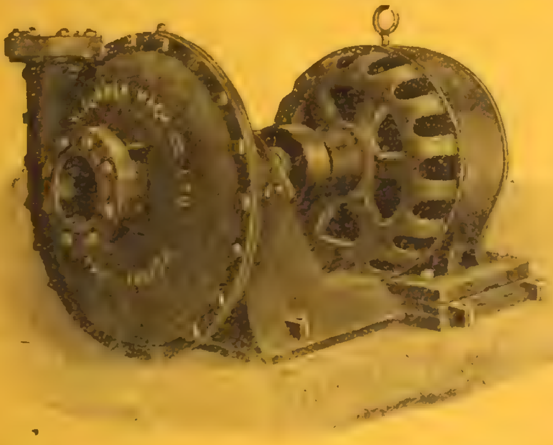
Vol. 24 Toronto, November 23, 1910 No. 47

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.



The **Smart-Turner Machine Company**
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

Large Bent Plate Glass for Shop
Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

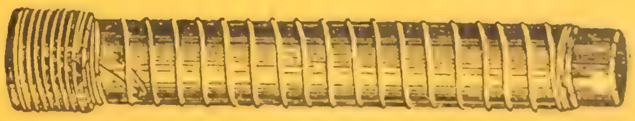
SEND US YOUR ORDERS
FOR

Bar Steel

Iron Finish Smooth Finish
Reeled

PROMPT SHIPMENT FROM STOCK

A. C. Leslie & Co., Limited
Montreal



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems,
Fire Protection, Power Plants,
Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—
and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

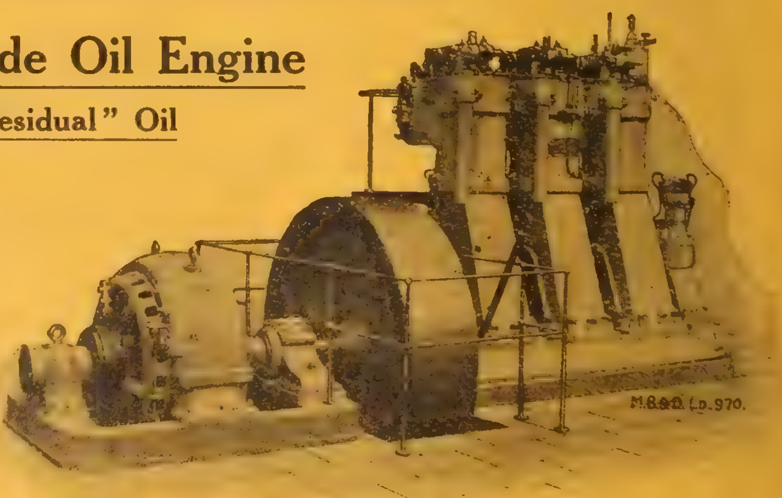
Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdown
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work

	Page
Canada Wire Goods Mfg. Co	54
Dennis Wire & Iron Works	10

Belting

Federal Engineering & Supplies, Ltd	51

Boilers

Inglis, John	24
Jenckes Machine Co	2
Leonard & Sons, E	55
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Mussens Limited	32
Taylor-Forbes Co	
Waterous Engine Works Co	18

Brick

American Enamelled Brick Co.	
Canadian Pressed Brick Co	55
Don Valley Brick Works	7
Hamilton Pressed Brick Co	10
Milton Pressed Brick Co	8
Port Credit Pressed Brick Co	55
Toronto Pressed Brick Co.	9

Bridges (Steel)

Canadian Bridge Co	52
Cleveland Bridge Co	52
Dickson Bridge Works	
Dominion Bridge Co	52
Phoenix Bridge and Iron Works	53
Pennsylvania Steel Co.	52

Builders' Hardware

Taylor-Forbes Co	

Cement

Alsen Portland Cement Co	62
Britnell & Co	22
Bremner, Alex	59
Canada Cement Co	3
McNally & Co., W	55
Morrison & Co., T. A	60
Rogers, Alfred	4
Rogers Supply Co	31

Conduits

	Page
Conduits Co., Limited	59

Concrete Pipe

Lock Joint Pipe Co	8

Concrete Mixers and Machinery

Canada Foundry Co	13
Cropp Concrete Machinery Co	6
Goold, Shapley & Muir	9
Hopkins & Co., F., H	64
Jenckes Machine Co	2
London Concrete Machinery Co	23
Mussens Limited	32
Morrison & Co., T. A	60
Rogers Supply Co	31

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co.	61
Buffalo Steel Co	
Canada Wire Goods Mfg. Co	54
Hamilton Iron & Steel Co	57
Trussed Concrete Steel Co	22

Contractors' Plant

Beatty & Sons, M.	54
Factory Products Limited	
Hepburn, John T	17
H. & E. Lifting Jack Co	53
Hopkins & Co., F. H	64
Katie Foundry Co	61
Marsh & Henthorn	51
Meaford Wheelbarrow Co	
Mussens Limited	32

Crushers (Stone and Rock)

Hopkins & Co., F. H	64
Jenckes Machine Co	2
Mussens Limited	32
Morrison & Co., T. A	60

Corrugated Iron

Galt Art Metal Co	13
Metallic Roofing Co	51
Metal Shingle and Siding Co	
Ormsby, A. B., Limited	5
Roofers Supply Co	59

Contractors

	Page
McIlwraith, Jas. A	60
Nadel & Adler	60

Drills

Beatty & Sons, M	54
Canadian Rand Co	1

Deafening Felts

Cabot, Samuel, Inc	55

Drilling Contractors

Harvey, J	61

Dredges

Beatty & Sons, M	54

Engines

Canadian Boving Co	2
Inglis, John	24
Jenckes Machine Co	2
Leonard & Sons, E	55
Mussens Limited	32
Waterous Engine Works Co	18

Excavators

Harris, J. W	11

Electrical Apparatus and Supplies

Factory Products Limited	
Northern Electric & Mfg. Co	

Engineers (Civil and Mechanical

Barber & Young	60
Chipman & Power	60
Bowman & Connor	60
Farmer, John T	60
Fuce, Edw. O	60
Galt Engineering Co., John	60
Glaubitz, H. J	60
Hunt & Co., Robt. W	55
Inglis, John	24
Kennedy, Jas. C.	60
Lea & Ferguson	60
Mace, T. Harry	60
Mitchell, C. H	60
McRae, John B	60
Moore & Scollan	60
Taylor, James	60

Fire Apparatus

	Page
Factory Products Limited	
Morrison & Co., T. A	60
Seagrave, W. E	23

Fireproof Doors and Windows

Douglas Bros	14
Mussens Limited	32
Ormsby, A. B	5

Gauges, Steam, etc.

Marsh, Jas. P	54

Granite and Marble

Laurentian Granite Co	60
Missisquoi Marble Co	19
Rogers Supply Co	31
Smith Marble & Construction Co	57

Glass

Chance Brothers & Co	
Consolidated Plate Glass Co	
Luxfer Prism Co	
Thompson & Co., B. & S. H	
Toronto Plate Glass Importing Co	1

Heating Apparatus

Jenckes Machine Co	2
Leonard & Sons, E	55
Taylor-Forbes Co	

Hoisting Machinery

Beatty & Sons, M	54
Factory Products Limited	
Inglis, John	24
Jenckes Machine Co	2
Hopkins & Co., F. H	64
London Gas Power Co	63
Marsh & Henthorn	51
Mussens Limited	32

Hydrants

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co	58
Kerr Engine Co	21

Interior Fittings

Lickleys Limited.	16

Lime

Christie, Henderson & Co	17
Jamieson Lime Co	19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

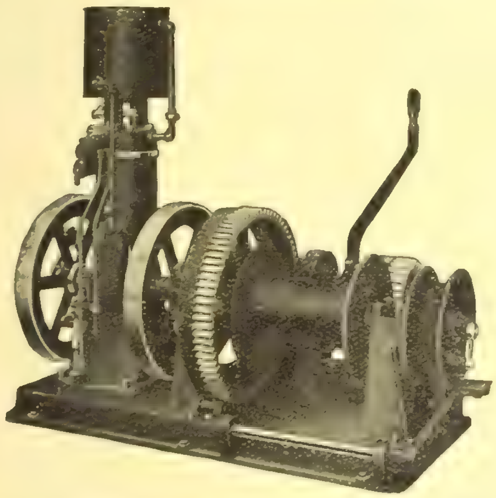
Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 **28 King Street West, TORONTO**

Climax Hoisting Engine

for running two platform Material Elevators

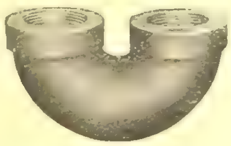


Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company
Hamilton, - - Ont.

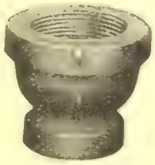
Semi Steel Fittings



RETURN BEND

PIPEHANGES

Y BRANCH



REDUCER

HEADER

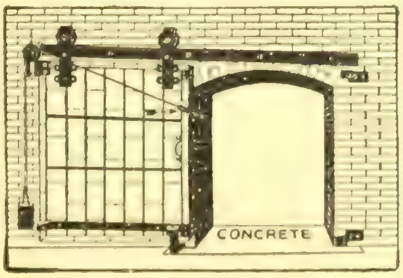
CROSS

A fitting for every purpose
TRY THEM

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

It is for Your Benefit we Label our Doors

Substandard Doors cost less money to make but mean a lesser Insurance allowance. **Proportionately, Labelled Doors give much larger returns** through Insurance allowance than do unlabelled goods.



Specify Ormsby "Underwriters" Fireproof Doors. Get all that is coming and the most for the money invested.

Experts in Fireproof Windows, Doors and Skylights.

A. B. ORMSBY, Limited

Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Batts Limited	16
[illegible] Ltd	20
Eaton & Sons, J R	25
Georgian Bay Shook Mills	63
Rhodes Curry & Co	
Sanitary Floor Co.	62
Siemon Bros	57
[illegible] Co	22
Woodstock Lumber Co.	62

Metal Lath

Galt Art Metal	13
Metallic Roofing Co.	51
Noble C. W.	20

Meters

Hopkins & Co., F. H.	64
Neptune Meter Co.	54

Paving and Paving Materials

[illegible] Carbolineum Works	12
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	62
Silica Barytic Stone Co., of Ontario	61

Plaster

Albert Mfg. Co.	
Britnell & Co	22

Pipe

Canadian Pipe Co.	58
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	58
Munderloh & Co	34
Municipal Construction Co.	16
National Iron Works	59
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	24

Paints and Varnishes

Cabot, Samuel, Inc.	55
Glidden Varnish Co.	
International Varnish Co.	21
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	23

Pumps and Pumping Machinery

Beatty & Sons, M	54
Goulds Pump Co.	
Hopkins & Co., F. H.	64
Inglis Co , John	24
Leonard & Sons, E	55
Martin Steam Pump Co.	34
McDougall Caledonian Iron Works, John	31
Mussens Limited	32
Ontario Wind Engine & Pump Co.	53
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	18

Roofing Materials

Barrett Mfg. Co.	
Galt Art Metal Co.	13
Metallic Roofing Co.	51
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	31
Roofers Supply Co	59

Railway Supplies

Factory Products Limited	
Gartshore, John J.	60
Hopkins & Co., F. H.	64
Mussens Limited	32

Road Machinery

American Road Machinery Co.	10
Case Threshing Machine Co.	58
Climax Road Machine Co.	5
Morrison & Co., T. A.	60
Mussens Limited	32

Sewer Pipe

American Sewer Pipe Co.	56
Britnell & Co	22
Canada Iron Corporation	59
Dominion Sewer Pipe Co.	56
Gartshore-Thomson Pipe Co.	58
Hamilton & Toronto Sewer Pipe Co.	57
National Iron Works	59
Ontario Sewer Pipe Co	14
Rogers Supply Co	31
Standard Drain Pipe Co	56

Sand

Rogers Supply Co	31

Stone

	Page
Britnell & Co.	22
Christie, Henderson & Co.	17
Consolidated Stone Co.	58
Contractors' Supply Co.	22
Corinthian Stone Co.	54
Crushed Stone, Limited	55
Doolittle & Wilcox	59
Hagersville Contracting Co.	5
Laurentian Granite Co.	60
Maloney John	53
Morrison & Co., T. A	60
Myers, Oakley	55
Rogers Supply Co.	31
Roman Stone Co	17
Sackville Freestone Co.	11

Submarine Driver

Roulean, Joseph N.	61

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	52
Eastern Canada Steel Co.	15
Hamilton Iron & Steel Co.	57
MacKinnon Holmes & Co.	53
Pennsylvania Steel Co.	52
Phoenix Bridge & Iron Works	53
Reid & Brown	60
Salter, W. H	53

Shovels (Steam)

Beatty & Sons, M.	54
Canada Foundry Co.	13
Hopkins & Co., F. H	64
Mussens Limited	32

Shingle Stains

Cabot, Samuel, Inc.	55

Slate

Roofers Supply Co.	59

Steel Shingles and Ceilings

Galt Art Metal Co.	13

Smoke Stacks

Leonard & Sons, E.	55

Safes and Vaults

	page
Taylor, J & J	

Stone Cutters

Bailey-Underwood Co.	62

Sheathing Papers

Cabot, Samuel, Inc.	55

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	57

Tanks and Stand Pipes

Inglis, John	24
Jenckes Machine Co.	2
Leonard & Sons, E.	55
Marsh & Henthorn	51
McDougall Caledonian Iron Works	31
Ontario Wind Engine & Pump Co.	53

Valves

Canada Iron Corporation	59
Gartshore-Thomson Pipe Co.	58
Kerr Engine Co.	21
Marsh & Co, Jas	54
Standard Fitting & Valve Co	5

Ventilating System

Gardiner & Gaskill	51

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	55

Wire Rope

Dominion Wire Rope Co.	64
Greening Wire Co., B.	62
Smith, Thos. & Wm.	

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	54

Water Wheels

Canadian Boving Co.	2

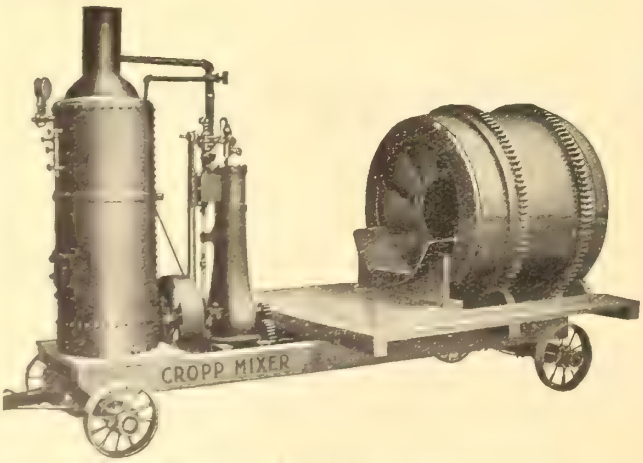
Water Power Plant

Escher Wyss & Co.	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

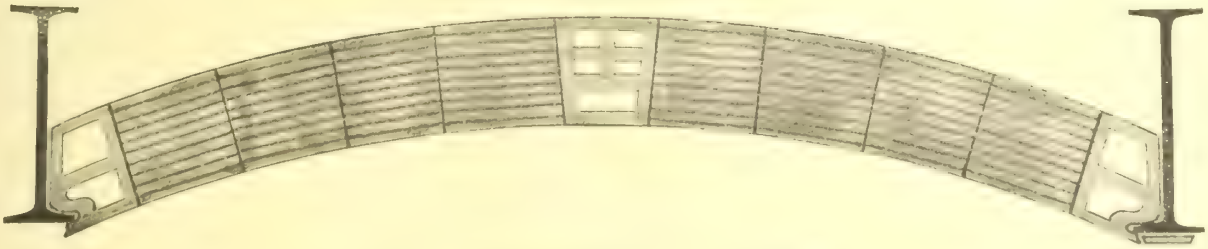
Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering
Arches

Furring
Blocks



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick
Vitrified Brick
Enamelled Brick
Wire-Cut Brick
Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

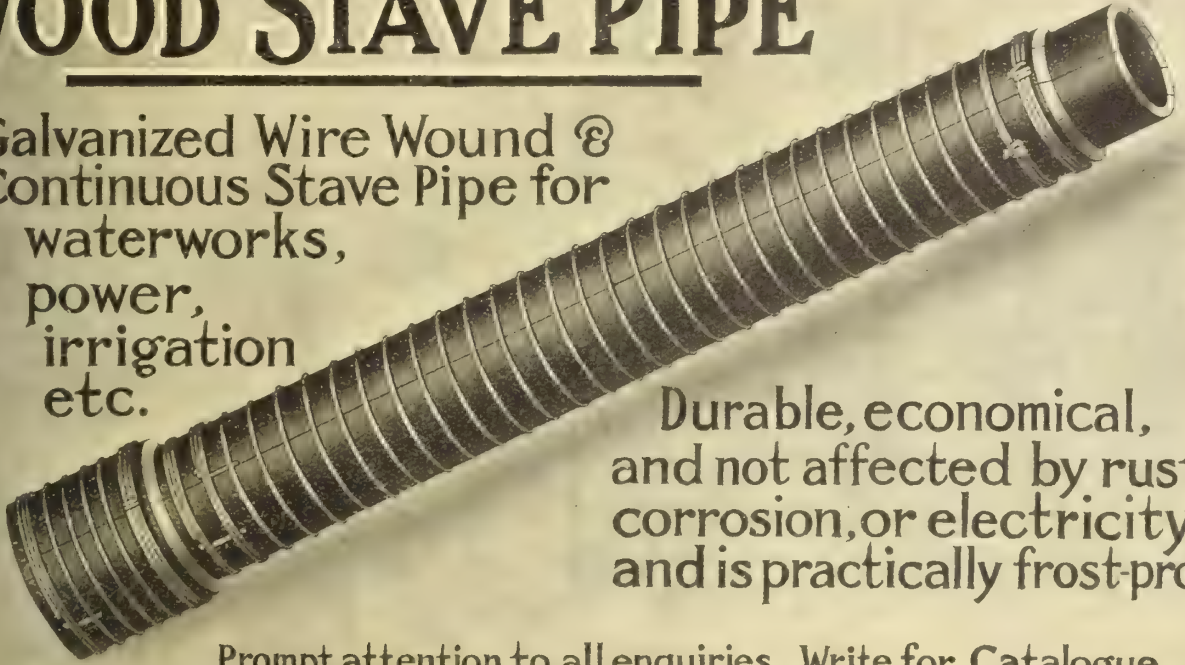
45 inch and 42 inch Pipe for Brantford, Ontario

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

WINNIPEG, MAN.—F. H. McGavin Co., Ltd.
SEATTLE, WASH.—Pacific Lock Joint Pipe Co.
LOUISVILLE, KY.—Harris Engineering Co.
MONTREAL, QUE.—Francis Hankin
CHATTANOOGA, TENN.—Howard Egleston
HAVANA, CUBA—Huston Concrete Co.



WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

HENRY NEW, President. ROBERT W. NEW, Vice-President.

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company, Limited

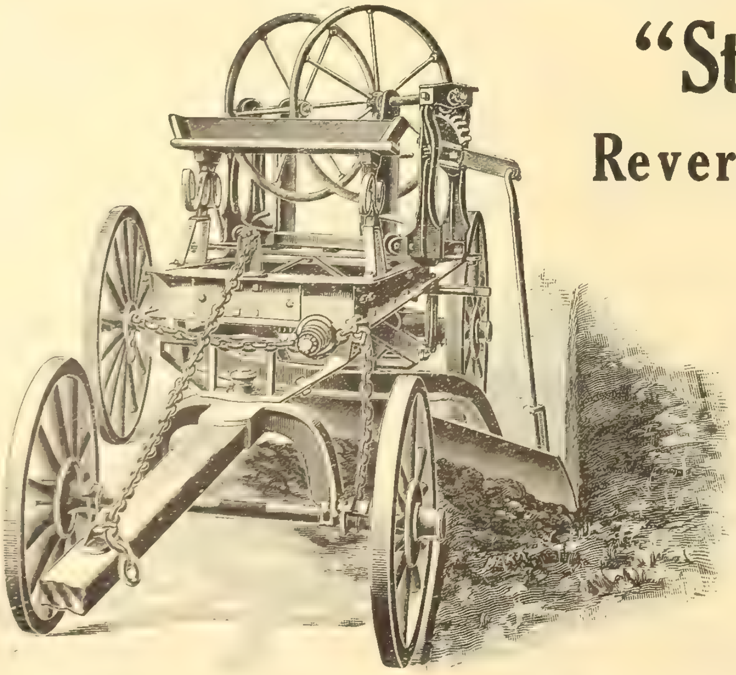
Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.

of Canada, Limited

Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

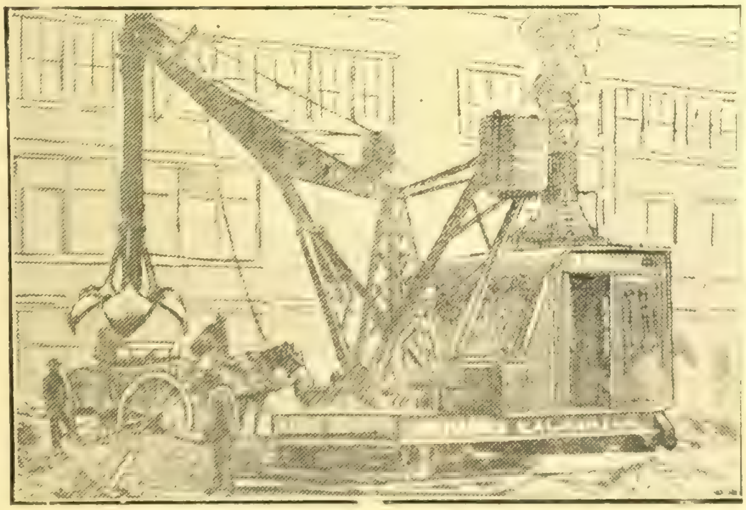
Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

The Advantage of the

J. W. Harris Excavator



is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

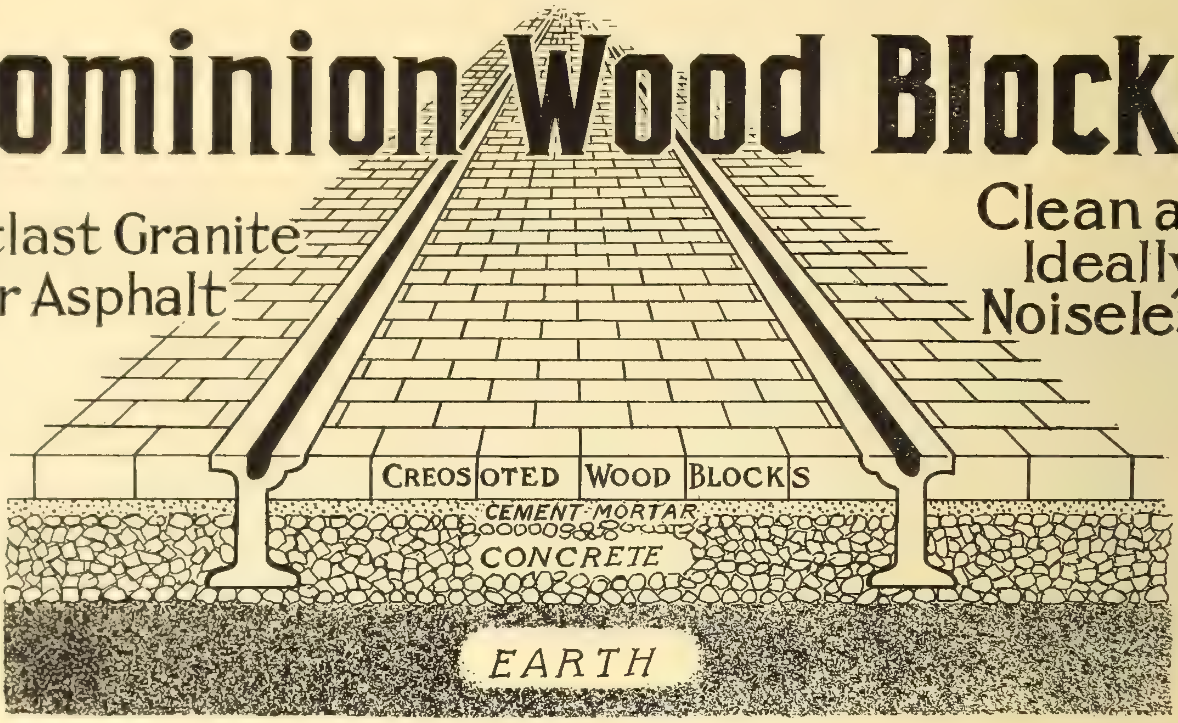
No Contractor should be without it.

For further information apply:

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Dominion Wood Blocks



Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless

THE IDEAL PAVEMENT

Dominion Creosoted Wood Blocks are recognized as the ideal material for pavement construction.

THE REASON WHY

They are not affected by extremes of temperature

They are easily cleaned.

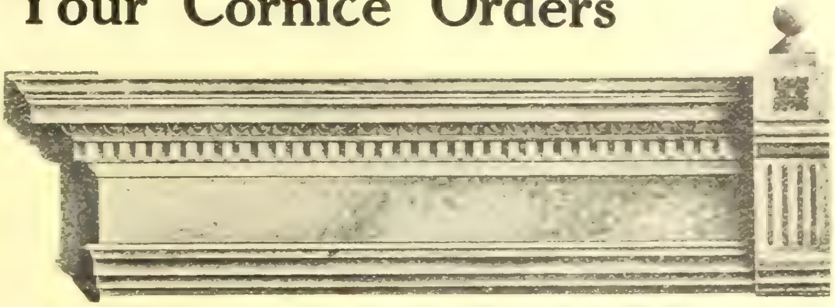
Can be laid by unskilled labor with ordinary tools.

Parts of the pavement may easily be taken up in order to effect water, sewer and gas connections and relaid so perfectly that the junctions cannot be discerned.

Dominion Creosoted Wood Blocks are made from close grained Douglas Fir of first growth, the best the market affords. There is no better material for the purpose than Douglas Fir; if there were, we would use it.

Dominion Carbolineum Works
Vancouver, B.C. LIMITED

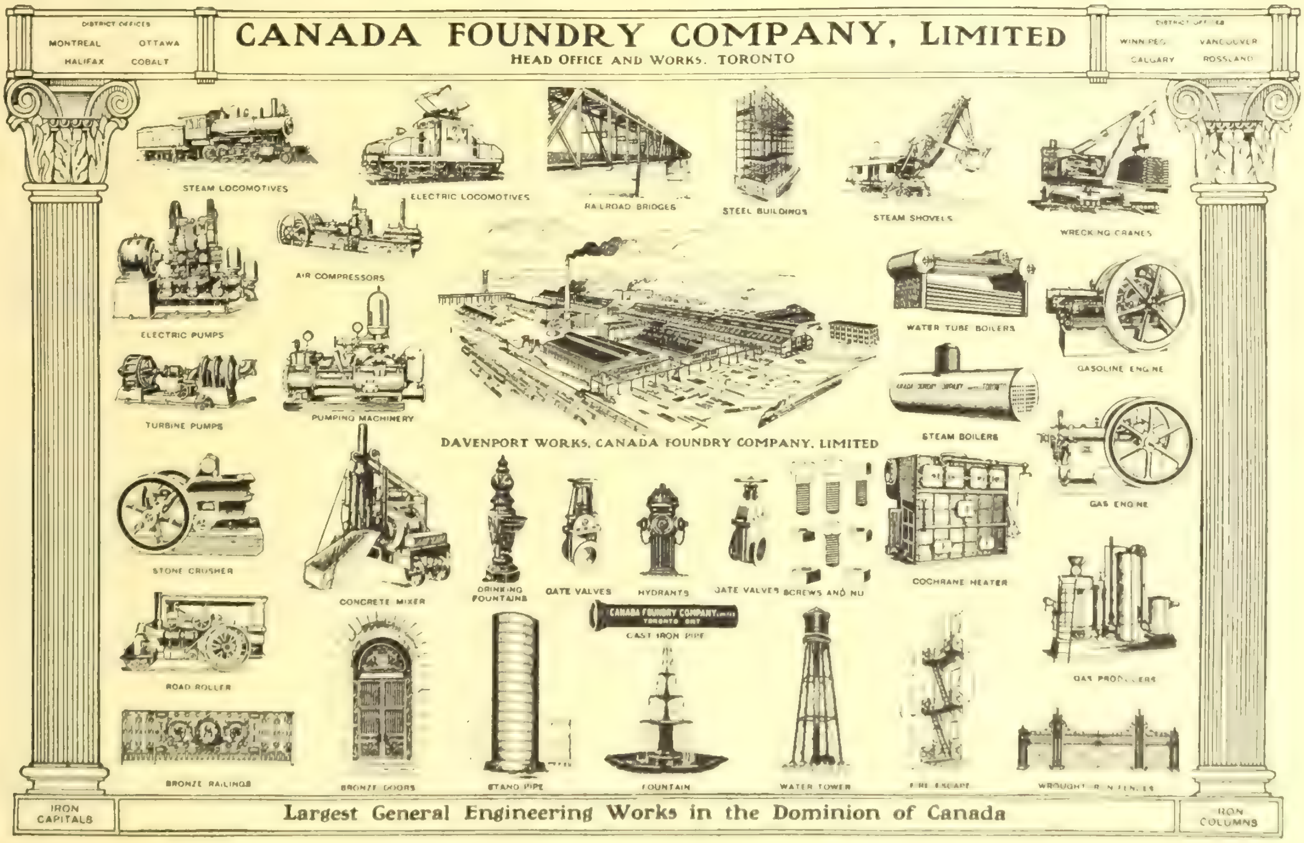
Send Us Your Cornice Orders



"Galt" Galvanized Iron Cornices are made on a 1909 model Ohl Power Press by men with years of international experience in this line. They fit accurately.

Prices right. Deliveries prompt. Let us quote on your requirements in **Cornice, Skylights or Fire-proof Windows.**

The Galt Art Metal Co., Limited, Galt, Ontario



DISTRICT OFFICES
MONTREAL OTTAWA
HALIFAX COBALT

CANADA FOUNDRY COMPANY, LIMITED

HEAD OFFICE AND WORKS. TORONTO

DISTRICT OFFICES
WINNIPEG VANCOUVER
CALGARY ROSSLAND

Largest General Engineering Works in the Dominion of Canada

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors plant

Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

Do You Want Sewer Pipe

PRICES ALWAYS RIGHT

Before Winter Sets In?

We still have a large and

Complete Stock

with which to

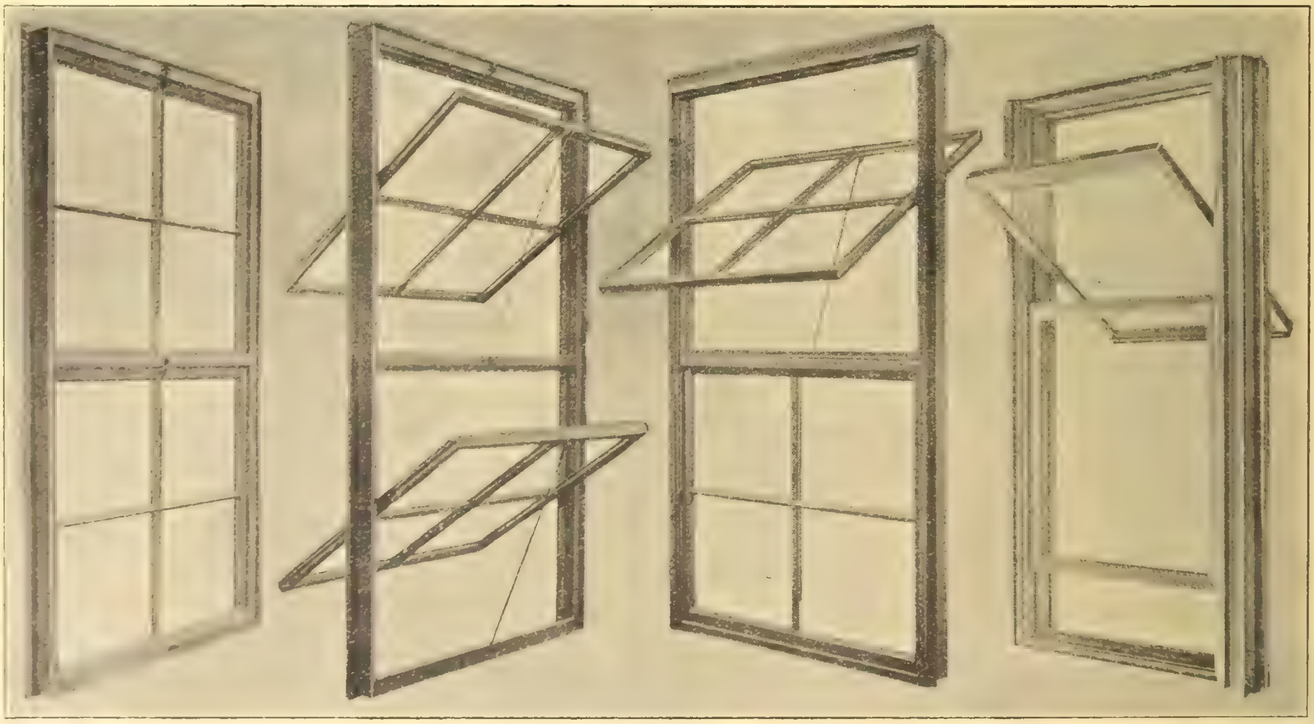
Fill Orders Promptly

and

we will pay for your telegrams if

you are in a hurry

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones:—Toronto Connection, Park 422—Evenings, Park 3888 and 3889



Pivoted Frame Closed — Pivoted Frame — Double Hung

Our Fireproof Windows have Stood the Test

DOUGLAS BROS., Limited TORONTO, ONT.

Eastern Canada Steel & Iron Works, Limited

ENGINEERS, MANUFACTURERS and CONTRACTORS

Structural Steel Work

OF EVERY DESCRIPTION

Large Tonnage - In Stock

Beams, Channels, Angles, Plates,

etc.

Prompt Shipments - Low Prices
Designs and Estimates Promptly Furnished

Head Office - - QUEBEC, P. Q.

Montreal Office - CORISTINE BUILDING

The Municipal Construction Co., Ltd.

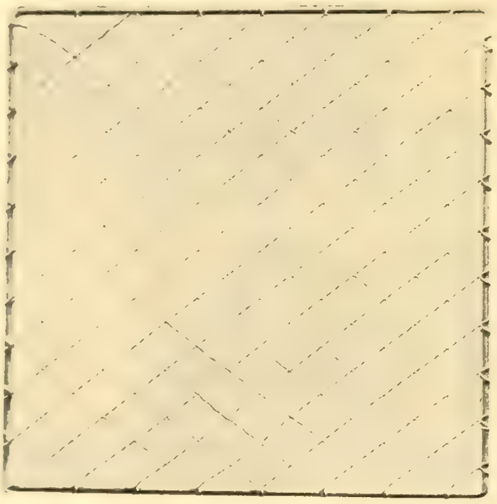
Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and
Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

Our Specialties

Special Mantels
Staircases
Panelling
Bank Fittings
Office Fittings
Glass Partitions
High Class Doors
House Fittings

Phone Main 3166 After Business Hours College 1097

Lickleys Limited

MAIL BUILDING

TORONTO

Estimates Given.

We supply Contractors with high class Interior Fittings of all kinds.

Enquiries for Ontario and East should be addressed to
LICKLEYS Limited,
Mail Bldg., Toronto

For Winnipeg and District,
J. MALCOLM SUTTIE,
Travellers Bldg.
Winnipeg

For British Columbia,
E. V. ALBURTY & CO.,
Dominion Trust
Bldg., Vancouver

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced Concrete Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

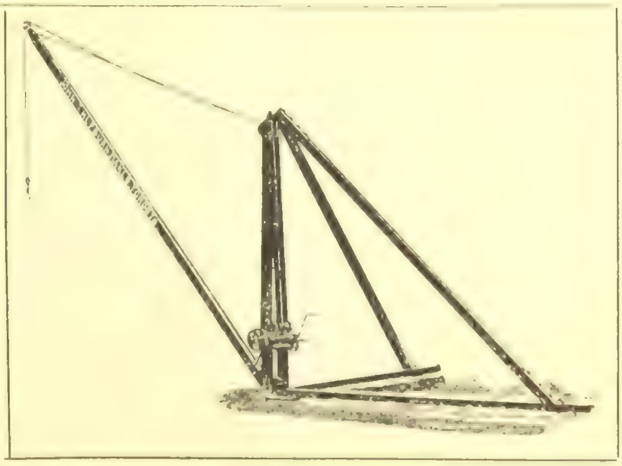
Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

No Better Derricks on the Market

Men who know the comparative value of Derricks will tell you that for all kinds of construction work there's nothing better made than

John T. Hepburn Scotch Derricks

They are made in standard sizes ¼ ton upwards this means that any part can be replaced at short notice. Are fitted with single and double purchase gears changeable in a moment from one to the other powerful band brake, and an ample length of first quality wire rope. The special safety catch locks the boom and prevents accidents. They may be operated either by hand or power.



These derricks are in use by leading contractors in all parts of the country. If you have any use for a Derrick it will pay you to investigate our line. Write to-day.

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

THE
MILTON
PRESSED BRICK CO.
LIMITED

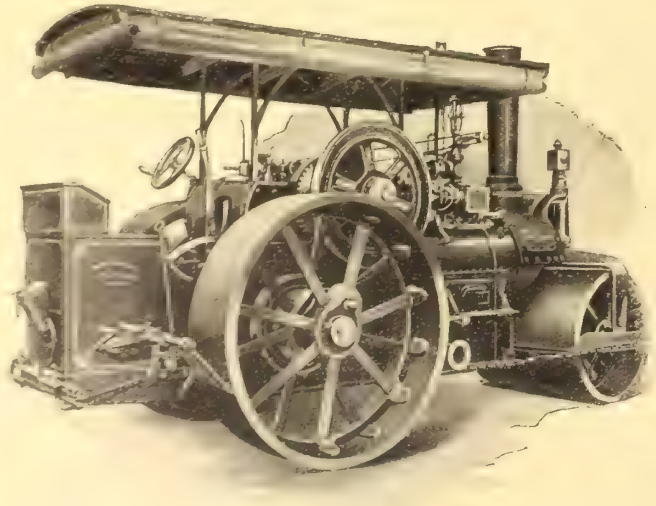
M P B Co

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St.



" A Canadian Roller
for Canadian Roads "

A little Roller Talk—

Progressive Municipalities are realizing more and more, that in the construction of a really good, permanent roadway, a first class Steam Roller is indispensable.

The Waterous Double Cylinder Steam Roller comes under this head

It is adaptable as a Rock Crusher. Can be used to haul road metal. In the different operations of road building from rolling the sub-grade to the final road trimming, the Waterous Roller does the work better, faster and cheaper and leaves a finished road that costs less and lasts longer than one built any other way.

LET US SEND YOU OUR NEW 20 PAGE BULLETIN.

The Waterous Engine Works Co., Ltd. Brantford, Canada

Right Here in Canada

Architects and Contractors can obtain marble with all the richness and depth of color that is to be found in the finest imported product.

Missisquoi Marble

is quarried in six distinct varieties which afford excellent opportunities for following out beautiful color schemes.

Light Grey
Dark Grey
Green Grey
Cream with Green Vein
Cream with Mottled Green
Cloudy Green and Pink

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
C. N. Barclay, Winnipeg, Man.
Eadie-Douglas Co., Toronto, Ont.
W. N. O'Neil & Co., Vancouver, B.C.
General Contractors' Supply Co., Halifax.

Why we have had to double the
Herringbone Manufacturing
Facilities

Because Herringbone is the most Rigid Metal Lath!

The Herringbone ribs act as miniture joists. They stiffen the lath so that it will span sixteen inches. They act as baffles throwing excess plaster back on the trowel.

They hold the wet clinch and cause it to seal in the strands instead of slipping off.

Baggy lath takes much more plaster than stiff lath.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

Business Insurance

How is business built up and reputation acquired?

Every Architect and Contractor must answer that question in the most practical way.

The degree of **his** success **depends** altogether on **the service rendered** and the **goods specified** or **recommended.**

There's no escaping **that** conclusion.

Naturally, we believe **International Varnish Products** are the best of their class you **can** specify or recommend.

Prejudiced we may be, but we have logical reasons for the faith that is in us.

You see we have been manufacturing varnishes, enamels, stains and finshes for over forty years.

We have worked hard and spent money like water to perfect our products.

And **many** prominent Architects and Contractors **declare** that **we have succeeded splendidly.**

We do not ask you to take our word.

Send us your name and address and we'll mail you a nickle steel bound book that actually shows things.

When you specify or recommend International Products you practically take out a policy insuring success. The quality of the goods is known and—

International Products are always sold in Full Imperial Measure Cans.

International Varnish Co., Limited
TORONTO **WINNIPEG**

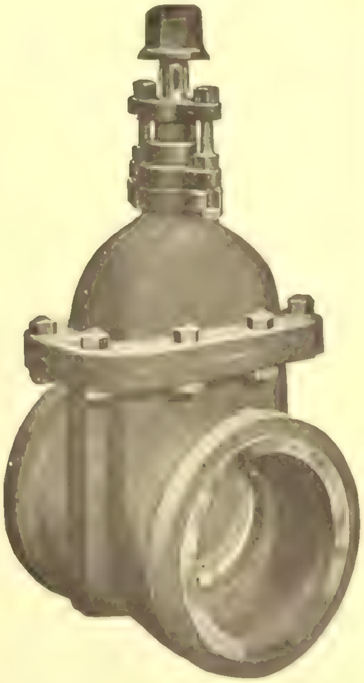
A 28

KERR

Valves and Hydrants

are used by cities and towns in every part of the Dominion. They have a reputation built up by years of long and satisfactory service. YOUR municipality should specify "KERR" for all waterworks' contracts.

Unsurpassed in
Workmanship
Design
Material
Efficiency



THE KERR ENGINE CO., LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Everything for the Builder

Sand and Gravel Screened, Pit Run and Pea Gravel Building Sand

We can also ship promptly, Building and Crushed Stone, Lime, Cement, Fire Clay, Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile.

LET US FIGURE WITH YOU.

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

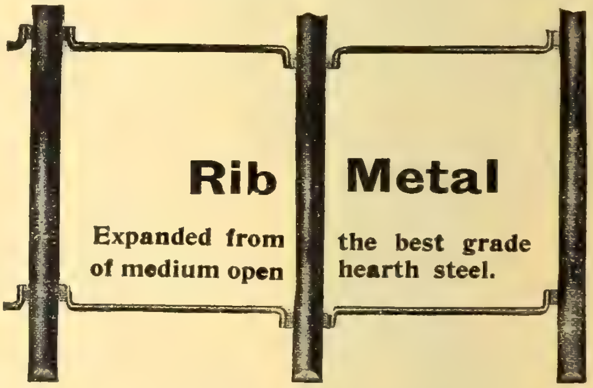
Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material.

Kahn System

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.


Rib Metal
Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

Chestnut House Trim

Our Specialty

also Pine and Hardwood

Our work gives satisfaction

The Tillson Co., Limited

Tillsonburg, Ont.

We give special attention to the manufacture of

Penstocks

and other Rivetted Pipe

First-class workmanship and prompt delivery guaranteed

International Marine & Signal Co.
Limited
OTTAWA - CANADA

For

Fire and Furnace Purposes

there are no better bricks than

GLENBOIG or GARTCOSH

Brands

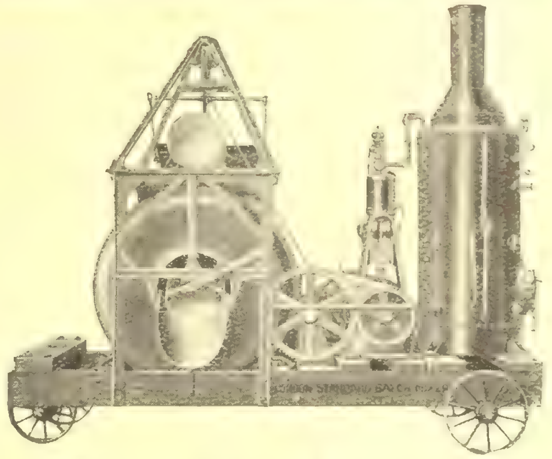
For Building Purposes

where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb, 13 St. John St.
Montreal



London Standard Drum Batch Concrete Mixer

Made in several sizes and with any equipment. This machine embodys the latest improvements in Batch mixers and is second to no other machine. Send for catalog stating capacity required.

We ALSO MANUFACTURE the now famous LONDON AUTOMATIC BATCH MIXERS Nos. 1 and 2, also Face-down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machine, Hand Drain Tile Machine, Sill and Lintel Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg.,
Montreal, Que.

Telephone Main 159

Mixed Cars

We make a specialty of mixed cars of builders' material.

SASH, DOORS (pine or veneered hardwood), **MOULDINGS, CEILINGS, FRAMES, EMPIRE BRAND HARDWOOD FLOORING, STAIRS,** etc.

These materials are strictly high grade and will give a FINISH to house that is sure to please even the most critical.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent
The Hardwood Flooring Co., 55 St. François Xavier St.

Heavy Plate Work

We Manufacture and Erect:

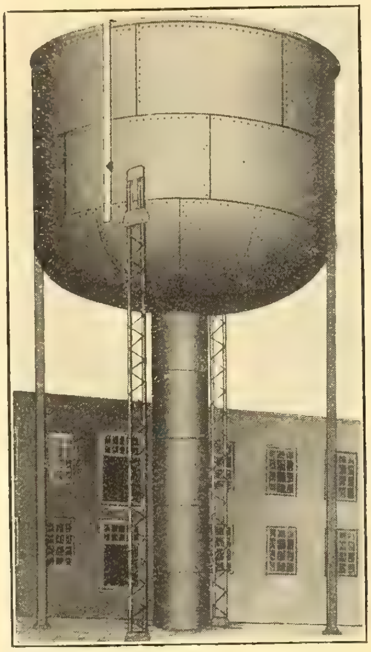
Stand Pipes

Penstocks

Water Tanks

Dryers

Fertilizers



100,000 GALLON WATER TANK,
built and erected by us for the Michigan Central Railway at Waterford, Ont.

Blast Furnaces

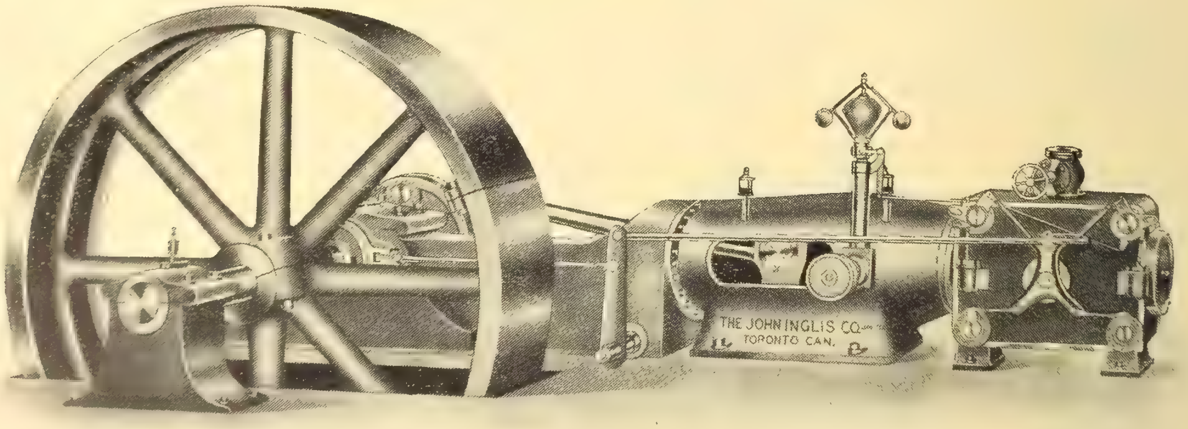
Flumes

Smoke Stacks

Special Machinery

Plate Work
of all kinds

"INGLIS" Corliss Engines built for a purpose, to last a life time


THE JOHN INGLIS CO.
TORONTO CAN.

Every Engine guaranteed to do just as represented.
Write us for particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Creston B.C.

The ratepayers at a meeting authorized the secretary appointed to ascertain the cost of the various kinds of piping required in the proposed sewerage system and also to appeal to Hon. Thos. Taylor, minister of works, for financial support. Estimated cost, $10,000. S. A. Speers, secretary.

Kingston, Ont.

A by-law will be submitted to the ratepayers in January next for the extension of Barrie street. Estimated cost, $3,600.

London, Ont.

It is stated that new tenders for the repaving of Dundas and Richmond streets may be called, the advisability of re-surfacing being questioned because of the undermining going on in that locality. The Barber Ashphalt Company held the contract for the resurfacing.

Montreal, Que.

The nature of the work and the amount apportioned in the estimates for public works next year is found in the following statement: For the enlargement of the waterworks, $1,000,000; for a filtration plant, $1,500,000; for execution of public works, $4,500,000; for a municipal lighting plant, $1,000,000; for underground conduits, $1,000,000; for working capital, $1,000,000. Total, $110,000,000.

New Liskeard, Ont.

Tenders addressed to F. W. Ferguson, secertary, Water Commission, will be received until November 25th for laying of about 550 feet of 4 inch and 600 feet of 6 inch c.i. water pipe, and also for the setting of valves and hydrants. Plans, etc., at office of C. H. Fullerton, town engineer.

North Toronto, Ont.

The report of Engineer T. Aird Murary on the sewerage system for North Toronto is as follows: 40 1-2 miles of sewers, $189,999; easements, $3,855; sewage disposal works, including land, $49,000; engineering fees, $11,650; legal expenses, $1,000; contingents, $10,000. The plan, as submitted, would take care of a population of 7,000 at 60 gallons per head per day.

Ottawa, Ont.

A number of new hydrants, estimated to cost about $4,217, were recommended by the fire chief, but will not be installed until next spring. The cost of water mains laid this year in Ottawa was $48,208.

Perdue, Sask.

The ratepayers will vote on a by-law for $2,900 to be expended on good roads.

Penticton, B.C.

The by-law to raise $20,000 for street improvements and drainage was carried.

Point Grey, B.C.

Tenders were called until November 23 for clearing and grading streets. H. Lloyd, clerk.

Tenders addressed to H. Floyd, clerk, Kerrisdale, B.C., will be reecived until November 26th for new reservoir (3,000,000 gallon capacity). Messrs. Cleveland & Cameron, engineers, in charge.

Pembroke, Ont.

A committee was appointed by the council to prepare a by-law to raise $65,000 by way of loan for the purpose of extending the waterworks. The report of T. Aird Murray, M.C.A.N., C.E., was read and included the recommendation that a new intake pipe be installed from O'Kelly's Point to 6,000 feet in to the main channel of the Ottawa, the diameter of the intake pipe to be 18 inches, of steel, flanged and bolted joints with flexible joints where required; and that a new and large fireproof pump station be built at O'Kelly's point, etc.

Roleau, Sask.

The $15,000 by-law for waterworks was carried.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until November 29th for construction of sewers in Cheltenham avenue, Bloomfield avenue, Ivy avenue, also culvert across Queen street, etc. Specifications at office of city engineer.

Victoria, B.C.

Tenders for valves for the waterworks department were received as follows: A. Sheret, $6.50 each; E. G. Prior & Company, $6.80; A. B. Fraser & Company, $6.80; B. C. Hardware Company, $8. Referred to city engineer, etc.

The tenders for repair of reservoir were as follows: C. J. Betts Company, Spokane, who agree to do the work at 30 cents per square yard, making a total sum of between $4,000 and $5,000; Newton & Greer, Victoria, $7,900; S. Rutter, Lampson street, Esquimalt, $[illegible],000. In their offer the Spokane firm mention "water proofing." Newton & Greer in their specifications propose to employ waterproof paints very largely, and the bidder from Esquimalt would do a lot of heavy concrete work.

The date for the voting on the borrowing of $700,000, for the purchase of the undertaking of the Esquimalt Water Works Company has been set for November 24th.

Vancouver, B.C.

The $500,000 sewerage by-law was carried. Noted in October 12th issue.

The Board of Works will soon be called upon to bring in a recommendation for the paving of Denman street from Georgia to Beach avenue, a largely signed petition having been filed with the city clerk asking that this work be done as soon as possible. Either wood-block or bitulithic paving is desired a full width of 42 feet.

Mr. H. M. Burwell, consulting engineer of the city waterworks extensions, has submitted his report dealing with present extensions and contemplated improvements to the city waterworks system for the next two years. This includes the construction of an additional main up the intake and a high level main from Capilano Creek to the Little Mountain reservoir, at a total estimated cost of $690,000, excluding submerged pipes.

Estimate of cost of new supply main from Seymour Creek intake, capacity 12,000,000 gallons per day from present intake, and connection of Capilano system with Little Mountain reservoir.

Seymour Creek supply main—Pipe line from present intake to Second Narrows, complete, $236,000. Submerged pipes and shore connections, $65,000. Supply main from Second Narrows—Pipe line from Second Narrows to connection with city distribution system, corner Campbell avenue and Pender street, $107,000. High level main, from Capilano canyon to Little Mountain reservoir—Pipe line from canyon to Little Mountain reservoir, complete (excepting the submerged mains), $187,000; engineering and supervision at 5 per cent., $30,000; expense and loss on sale of debentures and contingencies at 10 per cent., $65,000. This report is of special interest at the present time owing to the proposed work of the Dominion Government in dredging First Narrows, which means an interruption of Capilano water service for a considerable length of time. During this time it will be necessary to use Seymour Creek water almost entirely unless arrangements are made beforehand for the continuing of the Capilano supply temporarily in the meantime. The report was laid over for further consideration.

Winnipeg, Man.

Tenders addressed to the Chairman, Board of Contorl, will be received until November 28th for construction of following sewers: In Centre avenue and in Wolfe street. M. Peterson, secretary.

Tenders for sewers, the total cost of which is estimated at $511,208, will be received within the next two weeks. The following are the detailed estimates as provided by Col. Ruttan, city engineer: Jefferson avenue, from McPhillips street to the Red River, $276,690; Clifton street, from Portage to Sargent avenues, $101,222; Livinia avenue, from Clifton to Strathcona streets, $6,757; Centre street from Assiniboine River to Portage avenue, $19,382; Ash street, from Assiniboine River to Godfrey avenue, $41,195; Godfrey avenue, $44,495; Godfrey avenue, from Cambridge street to Renfrew street, $56,905.

AWARDED.

Belleville, Ont.

The contract for the construction of [illegible] street sewer was recommended to Mr. Thomas Manley.

Montreal, Que.

The Montreal city council at its last meeting awarded to the John McDougall Caledonian Iron Works Company, Limited, of Montreal, the contract for a motor-driven centrifugal pump of 5,000,000 gallons capacity for $[illegible]. The unit consists of a 16 inch two stage turbine pump, driven by an Allis-Chalmers-Bullock [illegible] h.p. wound rotor motor. There were fif-

[illegible] tenders for this unit, including the [illegible] Inglis Company, of Toronto, Canada; Canada Foundry Company, of Toronto; [illegible] and Walker, of Toronto; Canadian Boving Company, of Toronto; Canadian Buffalo Forge Company, of Montreal; Mather & Platt, of Montreal, and Peacock Bros., of Montreal.

New Westminster, B.C.

The following contracts were let: The contract for the new cement walks to be laid on Alexander, Begbie, Lorne, Mackenzie and Church streets, on both sides, the full length from Columbia street, to Albert Peck, of this city; the contract for the paving of Columbia street extension from Fourth street to Leopold Place, to the Hassam Paving Company; the contract for the laying of the Eighth street sewer system, in which there are over twenty miles of sewer, to F. T. Sinclair, of Revelstoke.

Vancouver, B.C.

Contract for the block paving of Richards street, from Georgia to Robson, was awarded to the Paterson Timber Company at $6,571.31.

Winnipeg, Man.

The contract for sewer pipe and special was awarded to Thos. Jackson & Son, Winnipeg, $10,398. M. Peterson, secretary.

Railroads, Bridges and Wharves

Montreal, Que.

It is stated that the Grand Trunk Pacific will apply to Parliament for powers authorizing the construction of a line to enable it to connect with the Hudson Bay road which the Government proposes to build from the main line in Keewatin to the southwestern shore of the bay. The southern terminus of the road will be at a point near the mouth of the Garret and Pasqua Rivers, and from there the distance will be about four hunderd miles to York Factory on the Nelson River.

Owen Sound, Ont.

It is stated that application will be made for a Dominion charter for the dry dock for which the by-law caried in August last. Mr. Edward Box, the promoter, has returned from England, where, it is stated, he obtained the necessary financial backing. Mayor Harrison and W. P. Telford, ex-M.P., are interested.

Ottawa, Ont.

The city engineer has recommended that Mr. W. F. Tye, consulting engineer of Toronto, be engaged to report with himself as to a comprehensive plan for the entrance of all railways to Ottawa. The scheme upon which he is to report is an outgrowth of the Canadian Pacific plan for closing a section of the canal and constructing a tunnel between the two depots. Noted in last issue.

Toronto, Ont.

The G.T.R. management are calling for tenders until November 28th, for removal of houses on Empress crescent and vicinity. Ground must be cleared by March 1st, 1911.

Vancouver, B.C.

The Burrard Inlet Tunnel & Bridge Company called for tenders for boring on the site of the proposed new bridge across the Second Narrows until November 18th. The engineering firm in charge is Cleveland & Cameron.

AWARDED.

Aylmer, Que.

Contract for wharf here was awarded to Thos. Moran and John Moran, Arnprior, Ont., $8,974.

Bic, Que.

The contract for construction of wharf here was awarded to Theophile Beaumont, St. Thomas de Montmagny, $33,810.

Barrington's Cove, N.S.

Contract for wharf here was awarded to J. W. Dobson, Sydney, C.B., $29,000.

Great Salmon River, N.B.

Contract for breakwater here was awarded to C. A. Huntley, Parrsboro, N.S., $10,750.

L'Assomption, Que.

Contract for concrete ice pier was awarded to Jos. Renaud, St. Paul de Joliette, $4,910.

Lakeport, Ont.

Contract for reconstruction of wharf here was awarded to Samuel Gowan, Brockville.

New Edinburg, N.S.

Contract for breakwater here was awarded to J. E. and H. Bigelow, Canning, N.S., $11,900.

Pelee Island, Ont.

Contract for extension to wharf here was awarded to Donald McDermid, 43 Avenue road, Toronto, $13,000.

Riviere des Prairies, Que.

Contract for piers here was awarded to Morrow & Beatty, Peterboro, Ont., $8,520.

St. Andrew's, Que.

Contract for wharf here was awarded to Bridge & Wharf Builder Co., 362 Notre Dame street, Montreal, Que., $3,245.

Winnipeg, Man.

See "Business Buildings, Awarded."

Wallaceburg, Ont.

The Chatham Township Council received tenders for the two bridges to be built over Running creek as follows: Petrolea Bridge Company, of Petrolea; Jenks and Dressler, of Port Huron and Sarnia. The tender of the Petrolea Bridge Company beeing the lowest, was accepted for $2,050.00. The tenders specified steel.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

Plans are being prepared for a new insane asylum and call for a central building with wings, no part to be more than two storeys in height, and absolutely fireproof.

Cranbrook, B.C.

The Board of Trade and others will recommend to the City Council the erection of a new city hall. Estimated cost, $15,000. B. B. Benedict, secretary.

Collingwood, Ont.

The ratepayers will, in all probability, vote on a by-law to authorize the raising of $14,000 by debentures for the erection of a new fire hall. This amount will cover equipment as well as building.

Chilliwack, B.C.

The tenders submitted on September 24th for erection of city hall here disclosed the fact that no contractor was prepared to erect the structure required for less than $20,000. The amount of by-law was $15,000. A new by-law for the increased outlay will be submitted.

Calgary, Alta.

The time for receiving tenders for the two new schools, it is stated, has been extended.

Cobourg, Ont.

A campaign for a new hospital has been started and a public meeting called to consider question of site.

Fredericton, N.B.

Chief Rutter of the Fire Department is of the opinion that two fire stations instead of one should be erected.

Edmonton, Alta.

Tenders for erection of two storey frame school were called until Nov. 19th by A. W. Coone, secretary-treasurer, 44 Jasper avenue east. Plans, etc., with C. W. J. Haworth, Griffin's Packing Plant.

Guelph, Ont.

The Children's Aid Society will appeal to the public for assistance in the erection of a new Shelter. Estimated expenditure, about $9,000. Plans have been prepared.

The Property Committee of the city council and the Finance Committee of the city council have sent on the recommendation that plans and estimated cost be obtained for a new court house and jail and these compared with those for new jail and repairs to court house. Estimated cost of new buildings, $125,000. Mr. Beattie, county clerk; Mr. Hastings, mayor.

Halifax, N.S.

The Board of Works has received convincing testimony from the witnesses called that the City Home was not now suitable for the purpose for which it was being used.

Moosejaw, Sask.

The council have decided to co-operate with the Board of Trade to make the erection of a $50,000 Carnegie library possible for the city. E. M. Saunders, R. Bogue and J. W. Sifton are interested.

Kelliher, Sask.

The Atlas elevator in Kelliher was destroyed by fire on the 12th inst. It will be rebuilt.

Montreal, Que.

A permit for the secerdotal school of the Seminary of St. Sulpice has been issued, $49,000. The new structure is in the grounds of the Seminary, north side of Sherbrooke. A permit for repairs amounting to $20,000 was also issued for the present seminary. The architect is Mr. A. H. Lapierre.

A representative business committee has been chosen from the citizens to take charge of arrangements for the establishment of a hotel for working women of this city. Rev. Dr. Symonds, Rev. Mr. Sullivan, Mrs. Grafton, Mrs. F. Minden Cole, and others are interested.

Ottawa, Ont.

A new drill hall is needed here.

Building Inspector Garvock, of the Public schools, has been asked to make a report on the heating problem for the public library.

The Salvation Army will erect a new citadel on Gladstone avenue. Staff Captain Burrows is in charge of financial arrangements.

The board of directors of St. Luke's Hospital have chosen Horwood, Taylor and Horwood architects for the new laundry, tenders for which will be called very soon. It will be a detached building and thoroughly up-to-date.

Tenders for the addition to the detention home will be received at C. P. Meredith's office.

Port Arthur, Ont.

Tenders addressed to Rev. J. A. Grenier, S.J., pastor of St. Andrew's Church, will be received until December 12th for construction of a new church.

Rigaud, Que.

Tenders are being called until December 5th for construction of public building here by the Public Works Department, Ottawa. R. C. Desrochers, secretary.

Rosemount, Que.

The Catholic School Commissioners will erect an up-to-date school for which site has been purchased.

Renfrew, Ont.

The Separate School Board have sold the convent property. A new convent will be built on Lochiel street next year.

Regina, Sask.

The management of the . T. P. have accepted the proposals of the city re entrance into Regina. The depot will be on Albert street, as proposed, and the freight sheds constructed according to the plans already submitted to the railway company. Work will be started in the spring.

Sydney, N.S.

As soon as the membership list is up to the number justifying the erection of a new Y.M.C.A. building, a building campaign will be commenced. Mr. Thomas Thorburn, secretary.

Stratford, Ont.

A by-law will be submitted on January 2nd for authority to expend $15,000 to erect a market shelter.

Toornto, Ont.

Permit was issued to General Hospital for a 3-storey brick surgical wing, on College street, $250,000.

It is stated that plans have been prepared for the erection of a new Grace Hospital.

Tenders will be received by R. C. Desrochers, secretary Department Public Works, Ottawa, up to December 12th, for fittings for the Toronto central post office. Specifications, etc., from Thos A. Hastings, clerk of works, postal station F, Toronto. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

At a meeting of the athletic directors at the university recently, the matter of the new athletic field and grandstand was discussed. The directorate of the athletic department have three propositions before them, one to build a grand stand of reinforced concrete to cost approximately $120,000, another to build a stand of cement, cost about $100,000, and another to build it of wood and concrete, cost about $50,000. Prof. C. H. Wright is to report.

Victoria, B.C.

The plans for the new school at the corner of Bank street and Leighton road were considered, but no action taken.

Vancouver, B.C.

Plans were presented to Building Inspector Jarrett for the erection of a theatre, corner of Harris street and Westminster avenue, $65,000.

The directors of the Vancouver Athletic Club will probably join with the Commercial Club in erecting a big eight storey building on Pender street, between Seymour and Granville streets. The matter will be put to the shareholders of the Athletic Club. Estimated expenditure, $230,000. The option on the proposed site expires by December 1st.

The Vancouver Conservative Club have taken option on a site for a block to be used as permanent headquarters. Tentative plans have been prepared and show a brick building, 10 storey, which will cost approximately, $450,000. Geo. H. Cowan, M.P., is interested.

Competitive plans will be received by the Board of Park Commissioners for a refreshment pavilion building, buildings for animals, and improvements to grounds at Coal Harbor entrance, Stanley Park. Address Park Superintendent, Stanley Park, or Commissioner Eldon, 1158 Alberni street.

The amount raised here by the Y.M.C.A. building campaign is $505,783—$4,000 more than the amount aimed at. Construction will not be started until next spring. C. R. Sayer, western field secretary.

Wolfville, N.S.

Tenders are called until December 1st for erection of brick and stone church. C. B. Chappell, architect, Charlottetown, P.E.I.

Windsor, Ont.

The governors of King's College have decided to raise $25,000 for increased accommodation for the students. The committee appointed will report in St. John on February 2nd.

Weston, Ont.

Tenders addressed to J. H. Taylor, clerk, will be received until Nov. 26th for construction of transformer sub-station and fire hall, to be completed within 3 months. Plans, etc., at office of Chipman & Power, engineers, 204 Mail Building, Toronto.

Winnipeg, Man.

The Y. M. C. A. building campaign had reached $278,648 on the 19th inst.

The citizens of Winnipeg are to be asked to raise within a week $350,000 for the Y.M.C.A. This amount, added to the quarter of a million already in hand, will make possible the erection of the building on Vaughan street, with a branch on Selkirk avenue, to meet the needs of the north end of the city. G. F. Stephens, president; J. D. Ormsby, chairman of Young Men's Committee building campaign.

The awards of the judges on the competitive plans submitted for a tubercular hospital have been discussed by a joint committee of the board of control and the hospital committee, and the recommendation that the plans of George Teeter be given first prize and the work of supervising construction, was concurred in, subject to the calling of tenders which will prove whether or not the architect has kept within the condition that the building must not cost more than $75,000. The awards were: First, George Teeter (collaborating with Dr. C. T. Sharpe); second, C. W. U. Chivers; third, William Bruce. Six sets of plans were considered and all were reported good. Several sets were too complicated to be adjudged favorable for adoption.

AWARDED.

Campbellton, N.B.

The contract for erection of public building here was awarded to James Reid, Sackville, $28,592.

Diamond City, Alta.

James Patterson, Lethbridge, Alta., has the general contract for the new school building.

Hartland, N.B.

The contract for public building here was awarded to Messrs. J. W. and Chas. J. Smalley, River Bank, N.B., $16,700.

Moncton, N.B.

The contract for erection of public building here was awarded to O. J. Dunham and P. N. LeBlanc, of this city, $5,739.

Smith's Falls, Ont.

The contract for erection of new Collegiate Institute here was awarded to R. N. T. McFarlane, of Kingston, at $38,050. Owing to conditions imposed, Mr. John Davidson, who held the contract, gave it up.

Toronto, Ont.

The contract for roofing and galvanized iron work on the Museum building, Queen's Park, has been awarded to A. B. Ormsby, Ltd., Toronto.

Instructions have been issued to Commissioner of Customs John MacDougald to proceed with the proposed alterations and extension of the examining warehouse at an estimated cost of from $10,000 to $15,000.

Walkerville, Ont.

The contract for the foundation for the customs office building, owned by Hiram Walker & Sons, Ltd., has been awarded as follows: Piling, Candler Dock and Dredger Company; concrete, Corrick Bros. We are informed that no other contracts have been let. Burrowes & Wells, architects, 701 Trussed Concrete Building, Detroit.

Residences

Brandon, Man.

Building permit was granted to Charles J. Whillier for the erection of a brick veneer residence on Rosser avenue, $2,600.

Calgary, Alta.

Some recent permits issued are: A. F. Ritchie, for a $2,800 residence in Inglewood, Col. Walker's estate; R. C. Blow, a $2,500 residence on 10th street west; R. C. Lloyd, a $3,000 residence in Mt. Royal.

O. G. Davenish, of this city, is having plans prepared for a large apartment building to be erected on Eight street west.

Ottawa, Ont.

Donald Fraser will erect a large apartment house on the corner of Laurier and O'Connor.

Among the building permits issued recently are: St. Germain & Fraas, brick veneer dwelling, Carling avenue, $4,500; Ernest Webster, dwelling, Breeze Hill, $3,000; G. A. Elliott, dwelling, Mutchmor street, $4,500; W. F. Fields, dwlelings, Frank street, $7,500.

St. John, N.B.

It is stated that L. D. P. Tilley has secured option of the new Victoria Hotel, which will be turned into an apartment house.

Vancouver, B.C.

A permit has been issued for an apartment house, southeast corner of Bute and Comox streets, by Messrs. J. V. and E. G. Lightheart. The estimated cost of the block is $250,000. Among the various innovations for the new block will be an incinerator plant for the use of the tenants, disappearing furniture facilities, vacum cleaning, gymnasium, etc.

AWARDED.

Calgary, Alta.

Messrs. McDougall and Foster, contractors, have commenced work on the large apartment block being built at the corner of First street east and Seventh avenue.

St. Catharines, Ont.

The contract for brick and stone residence for Dr. W. J. [illegible], this city, has been awarded to [illegible], also of St. Catharines, at [illegible]. Architect, Thos. H. Wily, St. Catharines.

Business Buildings and Industrial Plants

Blenheim, Ont.

Mr. G. A. Fraser, of Thamesville, is considering the location of a canning factory here.

Berlin, Ont.

Damage to the extent of about $15,000 was done to the Alpha Chemical Company's factory here.

Campbellton, N.B.

The Trans-Continental Railway Company plans to erect larger buildings here, it is reported, at an estimated cost of $200,000. G. Grant, of Ottawa, Ont., is chief engineer.

Chatham, Ont.

The American Pad and Textile Company, of Greenfield, Ohio, capitalized at $1,500,000, have definitely decided to locate in Chatham, and will, as soon as possible, start to build a factory. Estimated cost, $20,000.

Fergus, Ont.

Beatty Bros. are feeling the necessity of the enlarging of their plant. A by-law will probably be submitted to the ratepayers as to the granting of civic privileges.

Flesherton, Ont.

The business block, which included post office and warehouse, etc., owned by W. Buskin, was destroyed by fire on the 18th inst.; loss, $3,600. Damage to the extent of about $9,000 was done to other buildings.

Galt, Ont.

The C. Turnbull Company, manufacturers, purchased two valuable pieces of property on King street, and will, it is stated, next year build a large extension.

Guelph, Ont.

It is stated the Messrs. W. W. Hesson and W. E. Rothwell will erect a factory here to manufacture carpet sweepers, etc.

Imperial, B.C.

The Imperial Fir Company will erect a $20,000 3-storey hotel here, to be completed by April, 1911. President C. C. Michener. Noted in last issue.

London, Ont.

It is understood that the McLaughlin Automobile Company have purchased the property at the southwets corner of Bathurst and Richmond streets, and that a large building will be erected.

Medicine Hat, Alta.

The general store belonging to Kilgrow Bros., at Grassy Lake, was destroyed by fire. Loss, $25,000.

Moose Jaw, Sask.

The Board of Trade, represented by Messrs. Miller, Saunders and Bogue, will approach the C.P.R. on the question of a station hotel.

Montreal, Que.

The sash and door factory owned by Phillipe Saumure, 1244 Sanguinet street, residence and other houses, were destroyed by fire on the 16th inst. Estimated loss, about $100,000.

New Westminster, B.C.

Tenders are required by the B. C. Electric Railway Company for the erection of a tramway station and office buildings. Architects, Messrs. Maclure & Fox, Winch building, Vancouver.

North Bay, Ont.

We are informed that the erection of veneer plant and basket factory for Mr. D. A. Leach, mentioned in issue of October 19th, will not be commenced before the spring. J. E. Farrell, chairman Industrial Committee.

Orillia, Ont.

The directors of the National Hardware Company purpose to enlarge their lock works.

Ottawa, Ont.

G. Trudel has obtained a building permit for bakery and stables, $6,500. A. Christie, builder, Rideau street.

The Diamond Arrow Motor Car Company and the Modern Machine Company have decided to unite their oencerns. The manufacturing will be done at the Modern Machine Company's works which will be much enlarged forthwith to do the work.

The building on the corner of Bank and McLaren streets, owned by Mr. W. H. Wooding, was destroyed by fire on the 20th inst. Estimated loss, $13,000.

Petrolea, Ont.

The 3-storey flour mills on King street, owned by W. W. Paing, of this town, was destroyed by fire on the 17th inst. Total loss, $10,000.

Perth, Ont.

The Fallbrooke Roller Mills, owned by A. B. Lees, were destroyed by fire on the 16th inst. Estimated loss, about $9,000.

Pembroke, Ont.

The Canada Box and Barrel Company, Limited, have selected a site for their new factory with water frontage on the Ottawa. President, Jas. F. Munro; secretary-treasurer, J. G. Forgie, both of Pembroke. G. S. May, of Ottawa, is a director.

Prince Albert, Sask.

Plans have been prepared by Olaf Albrechtsen for the three-storey block for Mr. J. H. Mitchell. Excavation will be taken out this year and construction started in the spring. Pressed brick with facings of stone will be used. The brick, it is stated, has been purchased. Estimated expenditure, $50,000.

Regina, Sask.

The finance committee decided to sell two lots to the Regina Plumbing & Heating Company.

St. Boniface, Man.

The council have closed an agreement with the Taggart Iron Works, Ltd., of Winnipeg, by which the company will erect a large building on lots 74 and 75, Montcalm street as a branch industry. Building operations are to commence within the next six months.

St. John, N.B.

Mr. C. E. Vail, whose alundry was recently destroyed by fire, will build a new plant in Leinster street. The building will be one storey, brick or concrete, fireproof. About 10,000 feet of floor space will be taken up. Garnet W. Wilson, Ritchie building, 50 Princess street, is the architect.

Sydney, N.S.

The Nova Scotia Hotel Company, Limited, which has purchased the Alphonse Hotel premises, have had the plans for the reconstruction of the hotel prepared and completed by Prof. Dahl, C.E., and tenders for the remodelling of this hostelry will be called for at once.

Sherbrooke, Que.

The Bell Telephone Company, it is stated, has purchased the Bellevue hotel property on Strathcona square, where, it is understood, their intention is eventually to erect a new exchange building.

Toronto, Ont.

The Bank of Ottawa has purchased the northeast corner of Broadview avenue and Gerrard street, and will, it is understood, erect a fine new bank building in the near future.

The Brown Milling Company have submitted a proposition to the Board of Control for the erection of a large flour mill and elevator on the site of the present mills, Princess and Esplanade streets. Proposed expenditure, $500,000; capacity of mill, 6,000 barrels; capacity of elevator, 1,000,000 bushels. Mr. J. C. Forman, assessment commissioner, has recommended the adoption of terms submitted.

Victoria, B.C.

A permit has been issued to John Hart for a one-storey brick business block, Fort street, $10,000.

The National Finance Company have effected the sale of the property of Lim Sam, corner of Douglas and Johnson streets. It is undertsood that the intention of the purchaser is to build.

Vancouver, B.C.

Plans for the Bank of Nova Scotia's extensions on Hastings street have been submitted, $30,000.

Messrs. David Gibb & Son will begin the erection of an hotel. The structure, which is to be of reinforced concrete, and steel, will cost $300,000, and will be situated at the southeast corner of Seymour and Dunsmuir streets.

Tenders were received until November 17th for erection of C.P.R. station, corner of Howe and Robson streets. Honeyman & Curtis, architects.

Plans have been prepared for a new modern 6-storey office building on the northwest corner of Hastings street and Westminster avenue. George Dawson, of Dawson & Luttimer, 500 Granville street, is interested.

Jonathan Rogers announces the erection of a 10-storey office building on the northeast corner of Pender and Granville streets. Cost, $500,000.

Permits were issued to Mr. Carter-Cotton for his new four-storey building on the corner of Pender and Cambie streets, work on which has already been begun, $200,000; Boyd-Fordham Company, for the erection of a $50,000 warehouse, northeast corner of Columbia and Powell street, the building being six storeys in height and constructed of brick; Bank of Nova Scotia, addition to premises on Hastings street west, $350,000.

Winnipeg, Man.

It has been decided to extend the J. H. Ashdown, Ltd., warehouse and offices on the corner of Bannatyne avenue and Rorie street. Work on the extensions will begin at once.

Plans have been prepared by W. G. Beach, 2 McLean Block, for the erection of an office building, six storeys high, 62 x 148 feet, of brick and stone, for Charles E. Colin. Tenders will be received next month.

The Twin City Hoisting & Manufacturing Company propose the establishment of a factory here. A. M. Smith, manager.

AWARDED.

Goderich, Ont.

Mr. E. Chandler, of Stratford, is in charge of the erection of the new G.T.R. station here.

Montreal, Que.

The Foundation Company, Ltd., have been awarded the contract for installing the foundations for the Dominion Express building, which is being erected on the site of the old St. Lawrence Hall. The foundations will consist of pneumatic caissons sunk to rock. Work will start at once.

Ottawa, Ont.
McKinley & Northwood, of Ottawa, have been awarded the contract for plumbing in the Rosenthal building, John D .O'Leary, of Montreal, the electrical contract, and Dunning & Company, of Ottawa, the galvanized iron roofing. C. E. Deakin general contractor.

Sarnia, Ont.
Contracts have been awarded for Scott Bros'. new bakery, corner of Christina and Davis streets, as follows: Geo. Bruce, carpenter work; Frank Gutteridge, mason work. Cost of building, $8,000.

Victoria, B.C.
Parfitt Bros., 1446 Gladstone st., have the contract for two buildings on Fisguard for Lee Mong Kow and the Chinese Benevolent Association. Cost, $15,000; also contract for warehouse for the R. P. Rithet Co., $17,000.

Winnipeg, Man.
The contract for the train shed for the Canadian Northern Railway Company, 150 feet long, has been let to the Manitoba Iron Bridge Company. Approximately 1,650 tons of steel are required for the work. The company has also been awarded the contract for the Canadian Northern Railway freight sheds.

Power Plants, Electricity and Telephones

Brandon, Man.
Several petitions are in circulation here asking the council to grant a franchise for the street railway to a Vancouver syndicate, which offers to build at once if given a reasonable franchise.

Calgary, Alta.
William Kennedy, jr., Montreal, has been chosen to investigate the power possibilities of the Bow and Elbow and other adjacent rivers.

Guelph, Ont.
The amounts to be voted on by the various townships and towns in connection with People's Railway are as follows: Proton township, $36,000; Luther township, $30,000; Garafraxa township, $25,000; Arthur, $20,000; Fergus, $20,000, and Elora, $15,000. Total, $146.000.

The Radial Railway Board have decided to ask the council to prepare and submit a by-law to raise the sum of $30,000 to provide for the extension of the Radial Railway into St. Patrick's Ward.

Kitsilano, B.C.
Tenders were invited until November 14th for the erection and completion of an exchange building for the British Columbia Telephone Company. Plans and specifications can be seen at office, 209 Cotton building, Vancouver. Bids to include all trades en bloc (excepting steel construction). A. Arthur Cox, architect.

London, Ont.
The city council will be asked to guarantee $150,000 of the bonds of the proposed railway between London and Sarnia. Ex-Ald D. A. Stewart is interested.

Marmora, Ont.
On November 28th, by-laws to issue $2,000 for the purchase of an electric light plant; $10,000 for the purpose of building a substation for the electric light system, will be voted on.

Mitchell, Ont.
The Hydro-Electric Power by-law was carried.

Montreal, Que.
The city having decided that underground conduits must be built, a number of civic officials will make an inspection of the various streets, and make a report as to places where conduits are most needed.

Alderman L. A. Lapointe gave notice at a recent meeting of the council of the city's intention to borrow $10,000,000 for the purpose of carrying on public works next year. The charter requires the formality of by-laws. The expenditure includes, $1,000,000 for municipal lighting plant, $1,000,000 for underground conduit.

Owen Sound, Ont.
Town Engineer McDowall presented a plan for a line extending from Southampton, Bruce Co., by way of Owen Sound, Meaford, Thornbury to Collingwood. Blue prints of this plan are being prepared. Among the directors are representatives from each town.

Ottawa, Ont.
The Trades and Labor Council of Ottawa recommended that a municipal charter be taken out for a railway from the city to the cemeteries.

Port Dover, Ont.
It is reported that the electric road between this place and Brantford will be built in the spring. Estimated expenditure, $900,000.

Penticton, B.C.
The municipal council is about to take out records on Penticton and Ellis Creek which will be a basis for supplying the town with 1,000 horsepower for power purposes. Five hundred horsepower will be developed with the installation of a domestic water service, work upon which will be commenced shortly. Five hundred horsepower will be in reserve for development when the occasion arises. F. Latimer, municipal engineer.

Sherbrooke, Que.
See "Business Buildings."

Toronto, Ont.
The tenders for electric light pillars were as follows: Reid & Brown, 8 pillars weekly for seven weeks, at $36 each; Canada Foundry Company, 20 pillars weekly for seven weeks, at $42 each; Flour City Ornamental Iron Works, Minneapolis, 75 pillars per week for four weeks, at $35.28 each, delivery to start in two weeks.

Weston, Ont.
See "Public Buildings."

AWARDED.

Calgary, Alta.
The following companies furnished each a carload of copper wire: Northwest Co., General Electric & Phillips Co., of Montreal. 50,000 lbs. of copper wire was purchased for $16.62 per 100 lbs., and 16,000 lbs. of aluminum wire at prices ranging from 21c. to 22c. a lb. Aluminum wire was purchased for power transmission purposes.

The following tenders for supplies for street railway were received: Twenty-four motors from General Electric Company, $14,700; eight hundred poles from Gorman, Clancy & Grindley, at $27 each, $2,216; fifty thousand ties from Western Supply Company, at 54c., $27,000; fifty ton of spikes from Gorman, Clancy & Grindley, at $2.75 per cwt., $2,750; eight thousand bonds for tracks from J. W. Campbell, at $40.60 per cwt., $3,248. Total, $3,248. In every case but one lowest tender was accepted. In the purchase of motors, the lowest price was not accepted. The Bullock Company tendered $450 below the General Electric Company, who secured the tender, but it was thought best to purchase the General Electric motors because they have the same controllers as the Westinghouse motors, also used on the street cars here. It is claimed that there are few Bullock motors in use in this country. The General Supply Co. and the Westinghouse Co. submitted tenders which were over $2,000 in excess of the General Electric Co.'s tender. The tenders for rails have not been decided upon yet, and this will be another big item.

Toronto, Ont.
The Board of Control recommended the following awards: Reid & Brown, Toronto, 56 pillars at $36 each, and 700 lanterns at $1.61 each; Canada Foundry Company, Toronto, 140 pillars at $42 each, and 1,050 lanterns at $2.30 each; Flour City Milling Company, Minneapolis, 300 pillars at $35.28 each, and 5,000 lanterns at $1.3 7each.

Winnipeg, Man.
The contract for supply of copper wire and cables were awarded as follows: E. J. Phillps, electrical works, Montreal, 200,000 pounds wire at 16 3-4c. per lb.; 100,000 pounds cable at 17c. per lb.; Wire and Cable Co., Montreal, rubber covered wire, total, $1,269. M. Peterson, secretary.

Miscellaneous

Hamilton, Ont.
The following building permits have been issued: Robert Dyet, erection of ten brick dwellings on Fife street for A. I. Proctor, $15,000; S. Levy, erection of two brick dwellings on Bold street, $3,000; Bennett & Thwaites, erection of a brick store building and brick stable, corner of Fairleigh avenue and Wilson street, $3,500.

Montreal, Que.
City Surveyor Barlow recommended the purchase of 500 snow carts at a cost of about $2,500.

Recent building permits include: Z. & J. St. Pierre, 423 Marie Anne east, house containing sixteen dwellings on St. Luke street, cost $16,000; Methodist Missionary Society, a hall building at 505 St. Andre street, cost $15,000; La Cie Construction Lafontaine, a two storey bowling alley and billiard building, on Sherbrooke street, $29,000; P. L. W. Duure & Company, two houses containing six dwellings on Amity street, $6,000; George Sleep, 20 Charron street, a two storey house on Grey avenue, N. D. de Grace Ward, $4,400; D. C. Leach, King George Apartments, a three storey building at 16 University street, $3,500; J. S. Smith, 207 St. James street, two three storey houses at 783 Sherbrooke street west, $16,000; N. Marcil, 614 Chambord street, a two storey house on Esplanade avenue, $3,000; L. Fortier, 2388 Esplanade avenue, house containing three dwellings on Christopher Colomb street, $3,800.

North Vancouver, B.C.
Bids have been received as follows by the city for a 15-tonsteam roller: Waterous Engine Company, Limited, Vancouver, $3,500; Buffalo Steam Roller Company, $4,250; Canada Foundry Company, $3,900; Mussens, Limited, gas motor roller, $3,290; Western Engineering Company, $2,860.

Prince Rupert, B.C.
Tenders addressed to Alexander Johnston, Deputy Minister of Marine and Fisheries, Ottawa, will be received until Janu-

Tenders and For Sale Department

Relaying Rails Wanted

We are in the market for a carload of relaying rails 30 pounds to the yard preferred. Hagersville Contracting Company, Limited, Hagersville, Ont. 48

Sealed tenders addressed to the undersigned, and endorsed "Tender for Fittings, Toronto Central Post Office," will be received at this office until 4.00 p.m., on MONDAY, DECEMBER 12, 1910, for the work mentioned.

Plans, specification and form of contract can be seen and forms of tender obtained at this Department and at the office of Mr. Thos. A. Hastings, Clerks of Works, Postal Station "F," Toronto.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, November 18, 1910.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 48

City of Winnipeg

Electrical Distribution System

Tenders for 500 K. W. Motor Generator Sets

Tenders for Electric Travelling Crane

Sealed tender, on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope, "Tender for 500 k.w. Motor Generator Sets," or "Tender for Electric Travelling Crane," will be received at the office of the undersigned up to 11 a.m. on THURSDAY, DECEMBER 15, 1910.

Copy of specification and form of tender may be obtained at the office of Smith, Kerry and Chace, Carnegie Library Building, Winnipeg, Canada, or at the office of the firm in Toronto, Ontario.

Each tender must be accompanied by a certified cheque as set forth in the instructions to bidders, which cheque will become forfeit to the corporation under the conditions set forth in that document.

The city reserve the right to reject any or all tenders, or to accept any bid which shall appear advantageous to the city's interests.

M. PETERSON,
Secretary.

Office of the Board of Control,
Winnipeg, November 11th, 1910.

Notice to Building Contractors

Sealed tenders will be received by the Municipal Clerk until 12 o'clock noon on SATURDAY, NOVEMBER 26TH, 1910, for the construction of a combined Transformer Sub-Station and Fire Hall. This building is to be completed within three months. Cash deposit of $200 required with each tender.

Plans and specifications may be seen at the office of the engineers, Mail Building, Toronto, or at the Clerk's Office, Weston.

R. J. BULL, Esq., Mayor, Weston, Ont.
J. H. TAYLOR, Esq., Clerk, Weston, Ont.
CHIPMAN and POWER, Engineers,
47 204 Mail Bldg, Toronto.

Positions Vacant

Advertisement under this heading two cents a word per insertion. Box No. ten cents extra.

WANTED, Architectural Draughtsman; must be experienced. State references and salary. Storey and Van Egmond, Architects, Regina, Sask., Can. 48

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

WANTED, position as Superintendent of Grading, Rock Work or Concrete, experienced. Box 154 "Contract Record," Toronto Ont. T.F.

---

ary 3rd, 1911, for the construction of a of a reinforced concrete wharf, timber approach trestle, power house with chimney, buoy shed stores, offices and dwellings, also the installation of drainage and water systems. Plans, etc., at above department, at office of the agent of the offices of the agents in Victoria, B.C.; Halifax, N.S.; St. John, N.B., Quebec and Montreal, at the local postoffice and at the Customs House, Winnipeg.

Quebec, Que.

Tenders were called until November 23rd for supply of stone, lumber and sand for the city.

Toronto, Ont.

Recent building permits include: F. G. ey brick dwellings, Wroxeter, $20,000; F. G. McBrien, two pair semi-detached two-McBrien, five pair semi-detached two-stor-storey brick dwellings, Perth, $8,000; Mrs. J. Richards, two-storey brick dwelling, 186 Bedford road, $4,800; F. R. Baumhard, one pair semi-detached two-storey and attic brick dwellings, Grace street, $4,600; H. W. Ireland, two and a half storey brick dwelling, Edgar avenue, $5,000; The Kent Estate, four attached two-storey brick dwellings, Richmond street west, $7,000; A. A. Kennedy, three attached two-storey brick dwellings, east side Spadina, Davenport, $6,000; Hedley & Bradford, three attached two-storey brick and roughcast dwellings, Emerson, $4,800; G. Phillips, three pair semi-detached two-storey brick dwellings, on east side Brock avenue, $12,000; J. S. Case, six pair semi-detached two and a half storey brick dwellings, on east side Western avenue, $36,000; M. A. Beesley, pair semi-detached two and a half storey brick dwellings, corner Fernwood Park and Fir, $5,000; J. W. Walker, pair semi-detached two-storey and attic brick dwellings, on Chicora avenue, $5,000; Elder Carriage Works, three-storey brick addition to factory, corner Soho and Phoebe, $9,000; S. Shaver, pair semi-detached two-storey and attic brick dwellings, on Breadalbane, $5,000; S. Olive, three attached two-storey brick dwellings and stores, Elmwood and Mackey, $6,000; J. A. Thompson, three-storey brick store and hall, corner Lansdowne and Wallace, $9,500; Love & Patchett, three attached two-storey brick dwellings, on Chorley street, $6,000; H. S. Hara, two and a half storey brick dwelling, Rowanwood avenue, $5,000; G. A. Griffith, pair semi-detached two-storey brick dwellings, College street, $9,000; J. Prager, two-storey brick warehouse, Elm and Elizabeth, $10,000; C. E. Walton, two-storey and attic brick dwelling, 1031 Gerrard east, $4,500; W. W. Hiltz, two pair semi-detached two and a half storey brick dwelling, 85-91 Hogarth avenue, $8,000; A. E. Playter, three-storey brick stores and lodgs rooms, 6 Danforth avenue, $10,000; H. Johnston, pair semi-detached two-storey brick dwellings, 35-37 Western avenue, $5,500;W. Braybon, pair semi-detached two and a half storey brick dwelling, 108-110 Hampton, $4,800; J. Henderson, pair semi-detached two-storey brick dwelling, Franklin, $4,500; Mrs. M. J. Low, three attached two-storey brick dwellings, Armstrong, $6,000; O. E. Perry, pair semi-detached two and a half storey roughcast dwelling, Dingwall, $5,000; F. Lindsay, two pair semi-detached two storey brick dwelling, Boultbee, $6,500; J. Shaver, five detached two-storey brick dwelling, Lee, $10,000; R. J. and W. C. Cooper, pair semi-detached two-storey and attic brick dwellings, Balmoral, $7,000; A. Grassi, two-storey brick store and dwelling, Roncesvalles, $5,000; High Park Lawn Bowling and Curling Club, two-storey brick curling and club rooms, Indian road, $12,000; Fred Holt, two-storey brick dwelling, Oriole road, $5,000; Mrs. Edith Quinn, two-storey brick dwelling, Warren road, $7,000; J. J. Thompson, pair semi-detached two-storey and attic brick dwellings, Macdonnell, $4,500; Frank Bowden, four detached two-storey brick dwellings, 649-655 Logan avenue, $8,000.

Vancouver, B.C.

Recent building permits include: George Weaver, 2006 Third avenue east, $3,500; H. H. Davis, 1035 Thirteenth avenue west, $4,000; A. L. Wilson, 1576 Eleventh avenue east, two houses, $3,200; St. Paul's Church, 1162 Jervis street, Sunday school room and rectory, $15,000; J. Stephen, 1285 Eleventh avenue west, $4,000; Geo. McCombe, 1728 Third avenue west, $2,600; J. Danner, 512 Boundary avenue, $3,000; G. C. Ossenger, 2968 Carolina street, $2,600.

AWARDED.

Nelson, B.C.

Cunningham & Oliver, Nelson, have secured the contract for building a steel barge here for the Canadian Pacific Railway Company. Cost, $20,000.

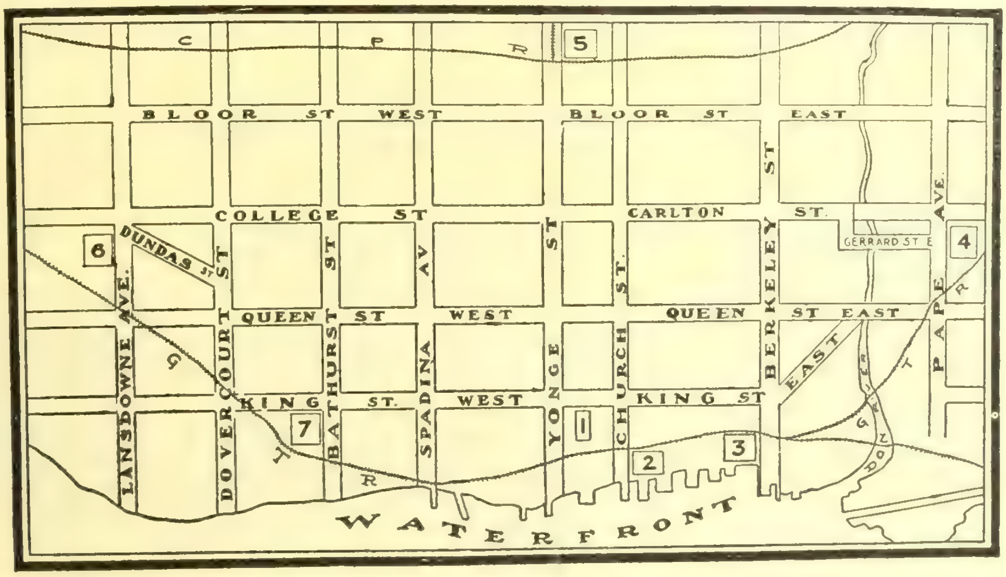
Winnipeg, Man.

The contract for supply of 600 feet 2 1-2 inch fire hose was awarded to the Canadian Rubber Co., Winnipeg, "Keystone" brand, at $1.10 per foot.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

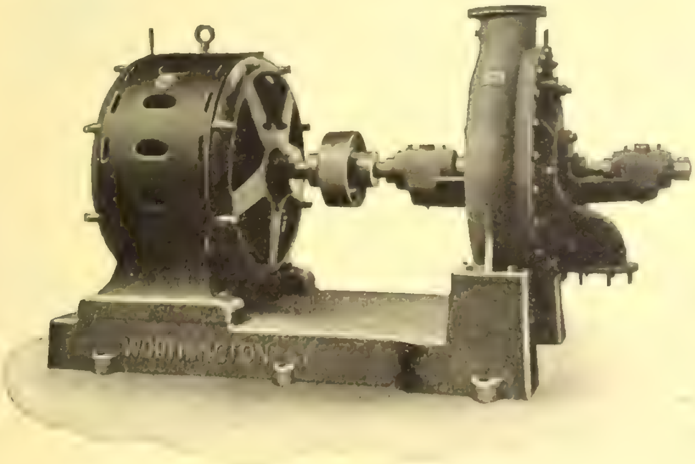
Telephone Main 4155 No's 2, 4, 5, 6



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

THE ROGERS SUPPLY CO., 28 King Street West, **Toronto**

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

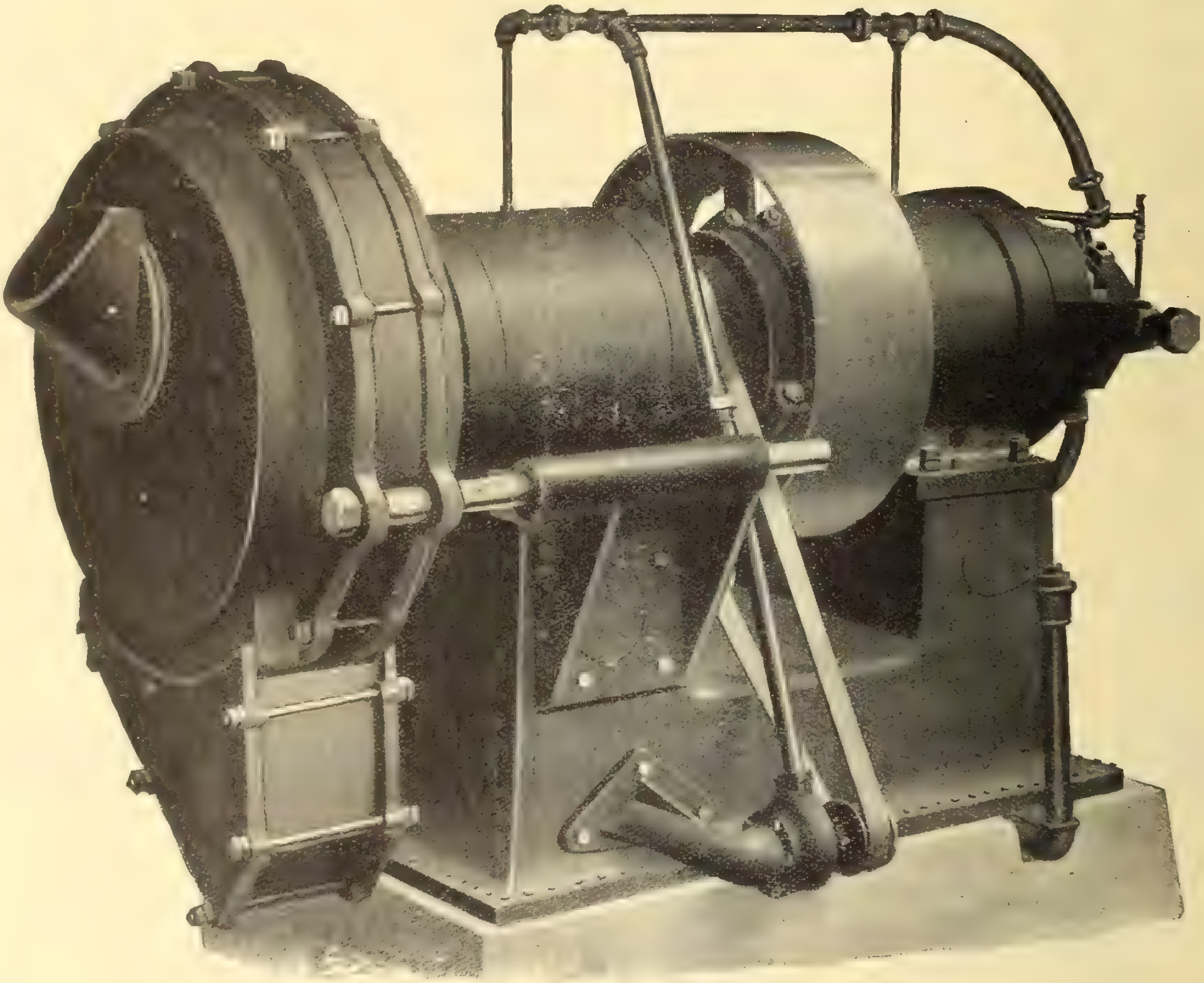
SEND FOR DESCRIPTIVE LITERATURE

WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

A New Princ



Sy

Cr

Look a

Takes large rejections or granite boulders and in one operation crushes down to any size

The largest size takes 8 inch stone and makes any size down to 1-2 inch and less.

The medium size takes 4 inch stone and makes any size down to 1-4 inch and less.

The small size takes 2 inch stone and makes any size down to 1-8 inch and less.

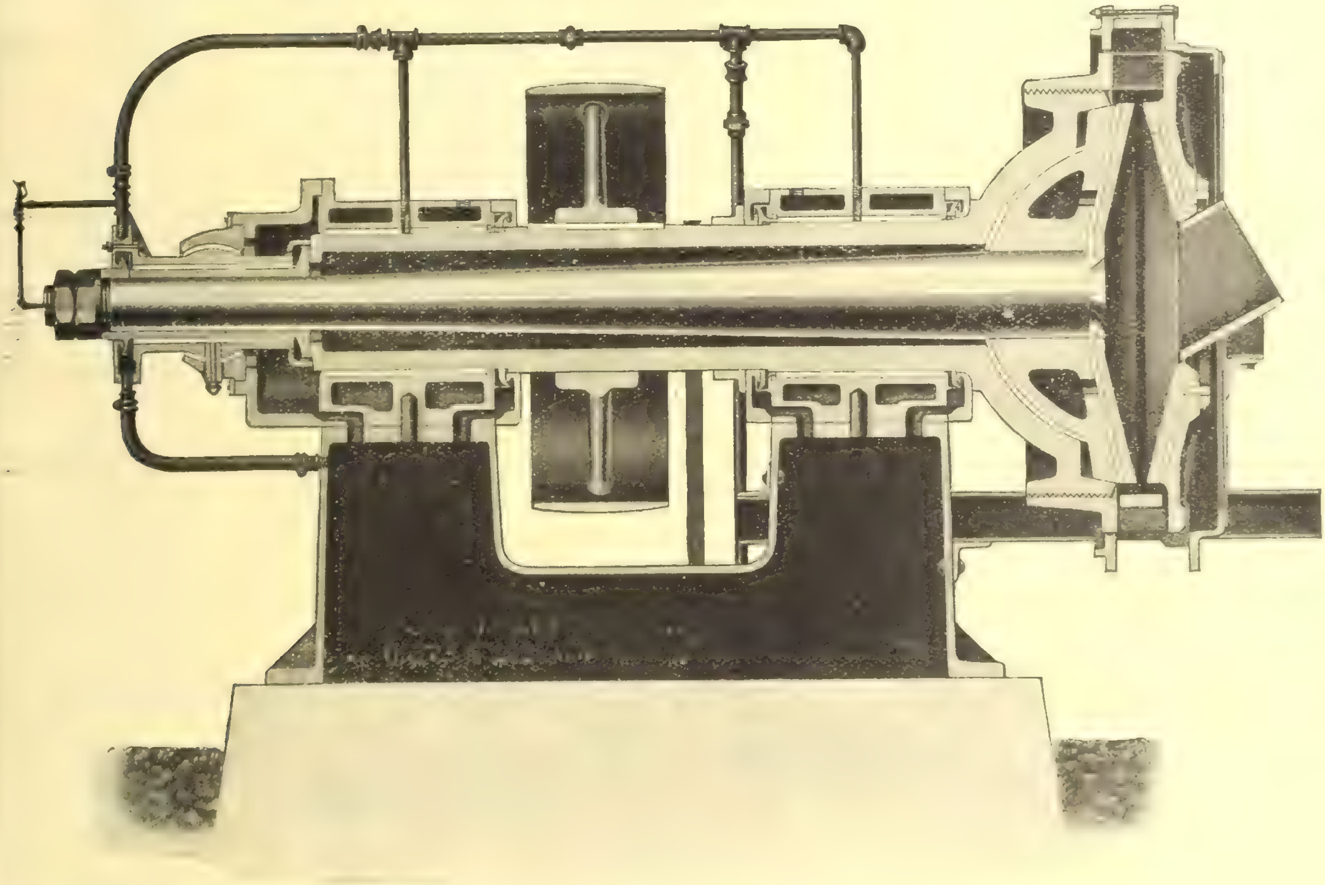
The Crusher has two Dish Shaped Manganese Steel Discs the hollow sides of which face eac other. These discs rotate in the same direction at the same speed. The stone is fed b

Head Offices and Warehouses :

Montreal

MUSSENS

e in Crushing



en them through a central feed opening and is caught between them where they are est apart, and carried around with them to where they are closest together being crush- in going halfway round. The smaller particles fly out during the next half round and larger pieces caught again. The crushing movement may be regulated while the sher is running.

Let us send you full information. Free on request.

LIMITED

BRANCHES:

Toronto	73 Victoria St.
Cobalt,	Opp. Right of Way Mine
Winnipeg	259-261 Stanley St.
Calgary	Crown Block
Vancouver	Mercantile Bldg.

Tar Macadam

The Ideal Material for Road Making

Prevents Dust or Mud.
Gives absolutely Waterproof Surface.
Possesses qualities superior to Granite or Limestone
Decreases the cost of Making and Repairing

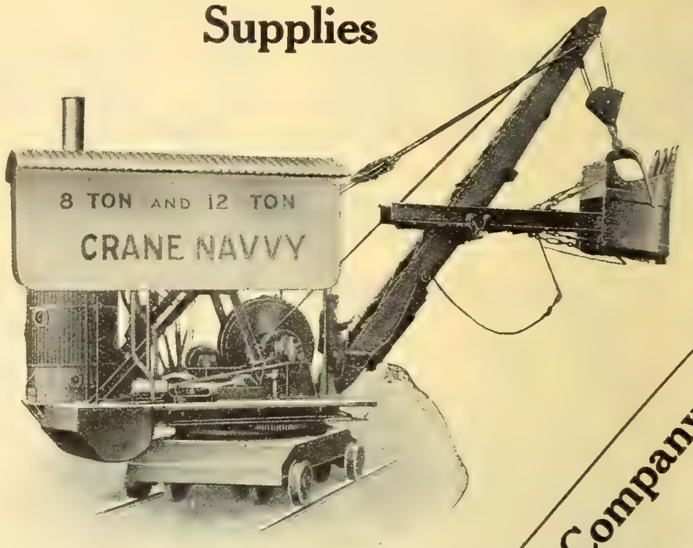
Vitrified Salt Glazed Clay Conduit

CONCRETE

MIXERS **PIPE** **MOULDS**

The Quartzlite Lamp
for
Factories, Yards, Warehouses

Complete line of Contractors Supplies



Send us your Enquiries NOW

Canada Ford Company
Montreal, Que.
Telephones:—
Main 7600
Main 7601

MODERN.

STRONGER.

CHEAPER.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in Canada for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

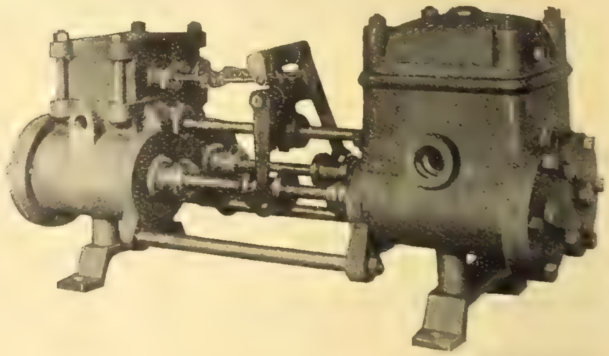
MADE UP TO 40 FEET IN LENGTH.

51 VICTORIA SQUARE,
MONTREAL.

RELIABLE

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto November 23, 1910 No. 47

Training the Engineer-Contractor

It has been said of the engineer, with a degree of truth, that he must be born and not made. Certainly it is an erroneous idea to suppose that the average student can be made a competent engineer by processes like those of learning to read and write or acquiring a language. In the first place the embryo engineer must be possessed of some originality, must be capable of ignoring precedent and must be a man of the sound judgment which comes of innate ability. At the same time, however, it cannot be denied that the training a man receives at college will either make or mar him, ability notwithstanding.

A particularly instructive letter published under the heading, Training the Engineer-Contractor, is contributed to this issue by Mr. Henry Holgate, the well known consulting engineer of Montreal. Mr. Holgate's letter is written in criticism of a letter by Mr. W. R. Harris, published in our issue of November 2. Mr. Harris contended that students should be instructed in the practical details of sewerage, building construction, machinery and so on, and that when they come to consider the design of such they should be required to make up a schedule of quantities, quoting market prices of materials and specifying the plan of operation and equipment required in the carrying out of the work. Students might further be required to prepare plans, specifications and estimates of actual work in the vicinity of the college. An open class discussion of the methods of each day's work would be the most important part of such a course, according to Mr. Harris.

Mr. Holgate's views are somewhat at variance with those expressed by Mr. Harris. "I have always recognized," he writes in this issue, "that the college does not turn out an engineer but an engineering student. . . . A man must develop into an engineer." Both, however, agree as to the value to the student of advice from a practising engineer.

Recently, the *Times* took occasion to refer to the subject of the qualifications of the engineer in terms which are particularly impressive. The following extract is interesting at this time:

> "The cardinal principle of reform depends upon the fact that it is to the public interest that positions of responsibility for engineerng work should be held only by engineers duly qualified by their respective institutions. It should therefore be possible to induce public bodies to make it a condition in appointing engineers for such positions that they should possess the diploma in evidence of fitness to carry out the work. This is the legitimate and proper object of combined effort, and there is evidence that municipalities and other official employers are ready to carry out their part of the process of excluding by this means all unqualified persons from public undertakings. Before the scheme can be firmly established, the conditions determining the grant of a diploma will in some cases have to be made more rigorous, and there will require to be greater coherence between the technical institutions, so that they can present a combined report of their respective qualifying powers to public or to private employers who seek their assistance. A clear notion is also necessary regarding what constitutes incompetence. It is not too much to say that some men are born incompetent, and that no amount of technical education or examination will correct the fault or discover the failing. What the institutions can do, however, is to apply a test that will give a very strong presumption of competence, especially if their test is made to depend upon practical work well done, rather than upon adroit questions conventionally answered."

R. E. W. Hagarty establishes a connection between this subject and that of engineering organization. Special attention, he holds, should be given to estimating and computing costs.

It will be instructive to discuss this matter further, and we trust that a number of our readers will give us the benefit of their experience and contribute their views.

Carrying Out Municipal Work

Some interesting and forcible reflections on how not to conduct municipal improvements were submitted at the recent convention of the American Society of Municipal Improvements, by Mr. Will P. Blair, of Indianapolis, Ind., Secretary of the National Paving Brick Manufacturers' Association. Mr. Blair first told of a city which, for a street of light traffic, put down 5-in. brick block pavement on 10-in. concrete base, thus wasting a large sum of money for unnecessarily heavy construction. Not content with this, the inspection of the paving work was entrusted to a lay member of the board of public works and he managed to mix things up pretty badly with the result that in a years' time this needlessly heavy and expensive pavement was in bad condition. Other instances of improper supervision of municipal work were cited and were contrasted with examples of good supervision. The paper closed with the statement that these improper conditions affecting the conduct of municipal work would never be remedied by efforts from outside the engineering profession. Mr. Blair thought the association before which he was speaking should take the lead in bringing about these improvements. He remarked that the great success of the General Electric Company has not been brought about with employes selected on the personal recommendation of this, that or the other man, but that instead the company has picked men of good collegiate training. Finally, he said that engineers must not submit to dictation from anyone founded solely upon political reasons.

The Engineer as Sole Arbitrator

In a letter to the "Contract Record," Mr. F. W. W. Doane, city engineer, of Halifax, N. S., makes the following criticism in respect to the position of the engineer as sole arbitrator, discussed in recent issues of this journal. The following is an extract from his communication:—"I readily endorse the principle, but find in practice that the arbitration clause does not always work out satisfactorily, owing to the weakness of human nature. In all such matters a great deal depends upon the man. With a good man, the engineer's estimate and the engineer as sole arbitrator are safe; with a good contractor the interests of the municipality are safe; but, as must occasionally happen when you have a contractor who is not absolutely reliable, or an engineer whose principles are not the best, the results must be unsatisfactory at times."

Clay Products to the Fore

Canadian Association to Meet in Toronto Next Month—Every Indication of a Record Gathering

The annual convention of the Canadian Clay Products Manufacturers' Association will be held in Toronto, December 14, 15 and 16. Among those who are expected to address the members are Mr. J. W. Ball, of Toronto, whose practical talks on kiln troubles at past meetings have been so helpful, and Professor W. H. Day, of the Ontario Agricultural College, who will discuss the tile drainage problem.

The question of power for clay-working plants is receiving more and more attention every season. This year the extension of the Hydro-Electric Commission service throughout Ontario has turned the attention of many clay-workers to electricity as a motive power. The announcement that Mr. Chas. A. Millar, of the Standard Brick Co., Limited, has consented to describe their power installation, which is entirely electrical, and to emphasize its advantages, will be received with pleasure by many clay-workers.

An open discussion will follow these papers and every member is invited to come prepared to ask any questions he may desire answered.

The Association banquet, which will probably be held on Thursday, Dec. 15th, will be the most attractive function of the kind yet held in connection with the convention.

A discussion will be opened on Friday, Dec. 16th, by Mr. S. J. Fox, M.P.P., on the subject: Which Pays the Better, Piece Work or Day Work? Mr. J. S. McCannell, of the Milton Pressed Brick Company, a former president of the Association, and Mr. W. N. Freeborn, of Brantford, have agreed to give their views on this question.

A visit will be paid to the plant of the Berg Machinery Company, at the corner of Niagara and Bathurst Streets.

This plant is one of the best equipped and most complete of its kind on the continent and will well repay a visit. Mr. Anton Berg, the president of the concern, has done a great deal to advance the interests of clay-workers by his enthusiastic work for the various trade associations of Canada and the United States.

The report of the committee on technical education which will be presented at this meeting will be awaited with much interest. Mr. D. O. McKinnon, Toronto, is secretary of the Association.

Unprofessional Conduct by Engineers

In a recent issue of the Engineering News it is related how a certain city desired to construct works for sewage and garbage disposal. A prominent resident of the city, himself an engineer of eminence, was consulted as to the best engineers to engage to prepare plans for these works, and he recommended a firm of engineers a national reputation. The firm was engaged, plans were prepared by them and bids upon these plans were received. The amount of the bids, however, was somewhat in excess of the amount which had been appropriated by a vote of the city. The chief engineer of one of the companies bidding thereupon appeared before the mayor and aldermen and declared that the engineers who had prepared the plans did not know anything about garbage and sewage disposal; also, that "they had so drawn the specifications that no one but their own people could bid for the work."

We quote this language from the public report of the meeting given in a daily newspaper. Later, the man who made this attack upon the reputation of this engineering firm declared over his own signature that the firm had drawn plans in the interest of a certain contracting company.

By argument of this sort, he brought the mayor and the aldermen to distrust the firm of engineers under whose plans they had been working and finally persuaded them to give him a contract to make new plans and specifications for the work. One of the baits that he used to secure this contract was the agreement that the successful bidder for construction could use all of his patents and patented appliances. He also agreed that, if the bids for the work exceeded a certain sum, his company would undertake the contract.

We need hardly say to our readers that the average board of aldermen, confronted by a glib talker presenting arguments of this sort, is exceedingly vulnerable. Quoting again from the newspaper report: "The city council agreed that this was a good offer and the mayor was authorized to enter into a contract with Mr. Blank at once. Mr. Blank agreed to have his plans and specifications ready to submit to the council to-morrow morning."

To an engineer, we presume the last sentence alone will be sufficiently eloquent comment upon the sort of plans and specifications which the city was likely to receive from this new engineer, and for which, by the way, it is to pay a fee of 5% of the cost of the work.

Another unique feature, which it is sufficient to report without comment, is that this new engineer has taken a very strong stand against the employment of an inspector on the construction work. He declared that such an inspector would simply be a nuisance and cause delays, and that, in view of his company's guarantee such an inspector was unnecessary.

We are glad to say that so far as we are aware this man, calling himself an engineer, who committed the acts above recited, is not a member of a national engineering society.

The point on which we desire to lay emphasis, however, if any emphasis is necessary, is the attempt of one engineer, or one claiming to be an engineer, to discredit another by attacks upon his professional reputation and professional honesty.

Surely if the engineering profession is entitled to be called a profession at all, it must brand such conduct as dishonorable. Standards as high as this obtain to-day in the world of business. The salesman who attempts to get business by attacks upon a competitor's reputation for honesty generally finds to-day that he has hurt himself more than he has hurt his rival. If the commercial world brands such competition as dishonorable, surely the engineering profession should have standards of conduct at least as high.

Early Development of Reinforced Concrete

In the introductory lecture to a course which will be given this year in the School of Building of the London, England, County Council, Mr. H. Kempton Dyson, secretary of the Concrete Institute, sketched the history and development of reinforced concrete, in the course of which he mentioned some primitive and early methods of reinforcing masonry.

He called attention to the construction used in the roof of a Roman tomb built on the Via Appia about 100 B. C., or earlier. It has been found to consist of a slab of lime concrete in which bronze rods were placed crossing each other to form a reinforcing latticework. The Romans also strengthened their masonry work by timber and tiles. In China, too, efforts were made to strengthen masonry by embedding foreign materials in it. At one point it has been found that the Great Wall of China, on a bad subsoil, was built on a kind of concrete raft, in which timber, reeds and rushes were embedded. In the Middle Ages, Mr. Dyson stated, timber was frequently employed to reinforce rubble-concrete walls.

The first suggestion of an idea of reinforcing concrete in modern times, according to Mr. Dyson, seems to have been a statement in J. C. London's "Encyclopædia of Cottage, Farm and Village Architecture," published in 1830, in which it was suggested that flat roofs might be constructed of latticework of iron tie-rods thickly embedded in cement and cased with flat tiles. About 1840 two systems of floor construction were employed in Paris, known as the Vaux and Thuasne systems; the former consisted of round rods, closely spaced, hooked over flat wrought-iron bars placed on the edge some distance apart and embedded in a slab of plaster-of-paris concrete; while the latter employed small iron joists with hangers or stirrups placed over them, in which round rods were suspended, placed in holes in the stirrups. Plaster of paris was, however, not a proper cement to be employed, as it caused the embedded iron to rust, and probably the reason reinforced concrete did not arrive sooner was that the world was waiting for a suitable cement—it needed Portland cement, which was invented in 1821, but was not manufactured to any extent until some years later.

The first real inventor of reinforced concrete in the modern sense seems to have been W. B. Wilkinson, a plasterer, of Newcastle-on-Tyne, who took out a patent for floors and beams of the same in 1854. Mr. Francois Coignet, a Paris contractor, took out a patent in 1855 for reinforcing slabs with a network of iron rods, and a M. Lambot, another French contractor, proposed the construction of ships by means of concrete with an embedded skeleton of wire, and he constructed a punt of the kind which was shown at the Paris Exhibition of 1853, and is still in service in a pond at Miravel, where he resided. Among those credited by Mr. Dyson with the development of the art are Frederick Ransome, Monier, Hyatt, who made a great many tests on reinforced concrete beams and worked out formulas for their strength; W. E. Ward, who erected a building in New York in 1875 containing reinforced walls, floor-beams and roof; E. L. Ransome and Hennebique.

Sand Blasting Concrete Surfaces and Cost

A Chicago company has recently made successful experiments in roughing the surfaces of sample concrete blocks, made from materials which are being used in the construction of a bridge at Lake Bluff, Ill. The bridge is being built in connection with the new United States Naval School and is about 285 ft. long, 60 ft. wide and about 100 ft. above the bottom of the ravine which it spans. Experiments showed that a very good surface could be obtained in a short time with air at 50 to 55 lbs., and that best results are more easily obtained on concrete a month old or more than on green concrete. The proper surface cutting is obtained by holding the nozzle at an angle with the surface and by varying the distance between the nozzle and the surface about 1,000 sq. ft. a day is easily covered, and with good men a maximum area of 2,000 sq. ft. could be done. An estimate of the cost of this class of work is as follows:

	8-hr. day.
1 tuck pointer	$ 4.80
1 laborer	2.50
1 engineer	5.00
Gasoline and sand	8.00
Machine, interest and depreciation	5.00
Incidentals	5.00
Total	$30.30

Assuming an average day's work of 1,000 sq. ft. this amounts to 3 cts. a sq. ft.

Reconstructing a Reinforced Concrete Bridge by shortening its arch, adding a pier and building another arch, is described in "Ingeniören" of Copenhagen. The macadam and part of the side walls of the old arch were removed and three holes, each 7 ft. square, were cut in it over the site of the new pier. The foundations of the latter were laid and twenty old 35-lb. rails were placed vertically in it in two rows, passing up through the holes in the old arch. The iron bars in the old arch, exposed by cutting the holes, were cut near the lower edge of the holes and bent upward to correspond with similar bars to be built into the new arch. The abutment of the new arch was cast, then the new arch itself, and finally the remainder of the pier. The work was carried on continuously by four shifts. Five weeks later the four strips of the old arch, projecting through the new work, were cut and wedges inserted. These were gradually slackened as the centering of the new arch was struck, thus preventing any serious unbalanced pressures on the pier from either side.

Cheerfulness is the most important factor in business and the most potent. It is also the one least to be recognized. Cheerfulness will attract more customers and sell more goods with less wear and tear than any other quality. There is practically no difference between cheerfulness and optimism. And no matter what you call this quality in a man it is the greatest business getter, the biggest trader, the greatest achiever in the world.

Hydrated Lime—Its Manufacture and Uses

Early Methods of Hydration—Systems in Vogue in Canada and the U. S.—Various Processes—Machinery Used—A Growing Industry

Specially contributed by L. E. ALLEN, Chemical Engineer, Belleville, Ont.

The manufacture of lime is one of the oldest processes known to commerce. It was produced in a crude was by the early Greeks and Romans, as is shown by an examination of the mortar from many of the ancient buildings in Greece and Italy. It probably preceded the manufacture of the old Roman cements, which show such remarkable tests of strength and permanency.

Owing, no doubt, to the imperfect methods of calcining the raw materials, the lime was thrown into pits in the ground and covered, and allowed to stand. The consequent hydration of the lime took place very slowly, but nevertheless surely, and produced a very fine lime putty, which possessed great plastic properties and when mixed with sand made a mortar of great binding power This method of hydration is still in vogue in some parts of Europe.

Until quite recently, the hydration of lime has been carried out in a more or less crude and unscientific manner, and what is now known as hydrated lime, was practically unknown as a commercial article fifteen years ago. The present day demand for a material put up in a convenient form to handle, an article that is stable under all ordinary conditions, and one that saves labor, has doubtless been the cause of the rapid growth of this industry within the past five years. According to the last report of the United States Geological Survey, there were, in 1906, thirty plants on the United States manufacturing hydrated lime; in 1908 there were forty-six plants operating; and the growth of the industry since 1908 has even been more rapid. In Canada this industry has been slow to develop, and there are now only some three or four plants manufacturing a commercial product. A considerable amount of hydrated lime is at present imported fro mthe United States and from Belgium.

Limestone Quarry.

Lime Plant of the Ontario Limestone and Clay Co., Limited, Belleville, Ont.

The process or reactions involved in the manufacture of lime and hydrated lime are quite simple, and yet there are various conditions which have to be met with in order to produce a high grade product. The most important essential in the production of a high grade product is the suitability of the raw material, limestone, or dolomite, which is a combination of magnesium carbonate and lime carbonate, commonly known as marble. In nature, carbonate of lime seldom occurs in a pure state, but nearly always contains a greater or less amount of oxide of iron, alumina, silica, phosphate of lime, magnesia, etc. Is many cases the magnesium carbonate is not considered an impurity, and in fact until quite recently it has been much easier to produce a high grade hydrated lime from a lime containing magnesia, as will be explained. Some of the largest and most successful plants in the United States, however, are producing what is known as a high calcium hydrated lime, or one made from a very pure limestone containing little, if any, magnesium carbonate.

The crude limestone is first quarried and broken up by hand to fairly uniform sizes, and then sent to the lime kilns. The most modern kilns are continuous, and are fired either with producer gas, coal or wood. The kilns are from 50 to 75 feet in height, and from 10 to 15 feet in diameter, and are usually set in batteries of two or more kilns. The limestone coming from the quarries is elevated and discharged into the top of the kilns during the day time, and there is usually sufficient storage space provided for in the uppor portion of the kiln to permit of sufficient limestone being stored to last for two days if necessary.

As the limestone gradually descends in the kiln, the moisture is first driven off, and gradually as the limestone becomes heated from the furnaces below, the carbonic acid gas is expelled and passes off in the form of a heavy gas through the top of the kiln. As the limestone descends still further and passes through the hot zone of the kiln, the last of the carbonic acid gas is driven off. The resulting lime is then cooled in a cooling cone at the base of the kiln, and the lime drawn as may be required.

The original limestone rock, if it be a pure limestone, has now lost about 44 per cent. of its original weight in the form of gas, the remaining 56 per cent. being lime. If this lime is sold a sordinary lime, it is simply barrelled or shipped in bulk. If it is desired to transform this quick lime, into hydrated lime, it should be treated soon after it is drawn from the kilns, as lime rapidly absorbs moisture and carbonic acid gas from the atmosphere, which decreases the yield of hydrated lime as well as the quality.

The quick lime is now delivered to crushers, which crush it to uniform size. It is then elevated into bins over the hydrating mill. The process of hydration consists of the addition of the proper amount of water to ensure perfect slacking of the lime, and an excess of water to allow for the loss in steam, due to the heat generated by the slacking of the lime. The addition of water chemically changes the quick lime (oxide of lime) to the hydrated lime (hydroxide of lime), in which form it is absolutely stable.

Referring to the old method previously mentioned, the hydration may be accomplished by placing the crude lime in large tanks, water added, and the mass agitated until the lime is thoroughly slacked. This leaves the hydratel lime in a wet, putty-like mass, which must be further treated by drying before it can be placed on the market. As a considerable excess of water has to be added in this method, there is a large amount of moisture to evaporate, which requires special dryers. This method of hydration is not used to any great extent on account of the high cost of production; however, a fine product can be made by this process on account of the slow hydration, which increases the plasticity of the product.

Hydrating Mill.

It will be readily understood that if it were possible to take advantage of the large number of heat units evolved during the process of hydration, to evaporate the small excess of water added in the beginning of the process, and thus leave the hydrated lime in the form of a dry powder, much time and expense would be saved. Some ten years ago, experiments along these lines were begun on a practical scale, and as a result machinery has been perfected to handle the product in this manner. The most successful type of hydrating machinery is performed under a partial vacuum thereby lowering the temperature of hydration, and preventing too quick a hydration of the quick lime, and also increasing its plasticity.

In this type of machine, the quick lime is first crushed to small grains, then either weighed or measured automatically, and fed into the hydrator. Here the water is added in the form of a fine spray, and the hydration immediately commences. At the same time the aterial is stirred, and moved forward in closed cylinders, so that every particle of the quick lime is brought into contact with the water. As the hydration continues the lime particles expand or "swell," so that when it is discharged from the hydrator, it is much bulkier and is in the form of a fine powder.

Knickerbocker Plant and Kilns (Pennsylvania).

The hydrated lime is now elevated and passed over vibrating screens, which remove any particles of grit or foreign matter, leaving the product absolutely free from all coarse particles. The product is again elevated or conveyed to storage bins and sacked by automatic sacking machines. It is usually sacked into 100-pound cloth sacks, or 40-pound paper sacks, the latter being much more convenient to handle.

Uses of Hydrated Lime.

The use of hydrated lime in preference to ordinary bulk lime, with those who have become familiar with its advantages, are so obvious. that it does not seem necessary to enlarge upon this feature however it is evident that the principal advantage is the fact that hydrated lime is absolutely stable when stored under the same conditions as Portland cement is stored. Its use saves the troublesome and expensive hand labor required to slake bulk lime and prepare it for making mortar. The hydrated lime simply requires the addition of water, and and whatever binding material is used to be ready for use.

An important use for hydrated lime is as a waterproofing agent with Portland cement, in concrete or stucco work. The last report of a Committee of the National Cement Users Association recommends the use of hydrated lime for this purpose in preference to the many patented waterproofing compounds now on the market, as its use does not injure the concrete, but when properly used within certain limits increases the strength of the concrete, and also makes it moisture and damp-proof. As a fertilizer for certain soils, it is becoming widely

The L. M. Palmer Plant (Pennsylvania).

used as in this form it is easily applied to the ground through ordinary drills, and corrects the acidity of the soil. In certain sections of the country it is also being extensively used as a component of fruit sprays. It is also used in the manufacture of sand lime brick on account of the uniformity of the product. Put up in suitable packages, it is a vtry convtnient insecticide tnd disinfectant, and is far more economical and convenient for this purpose than is the ordinary quick lime. It is also used in various chemical and technical processes which it would not be of interest to enumerate.

For most purposes it is obvious that a hydrated lime manufactured from a non-magnesian limestone is a much better product than one manufactured from a highly magnesian limestone, or dolomite, and it should also be sufficiently low in iron to produce a pure white product.

To sum up the essentials of hydrated lime, it is:

1.—A natural product—not a mixture of one or more products, hence its stability.

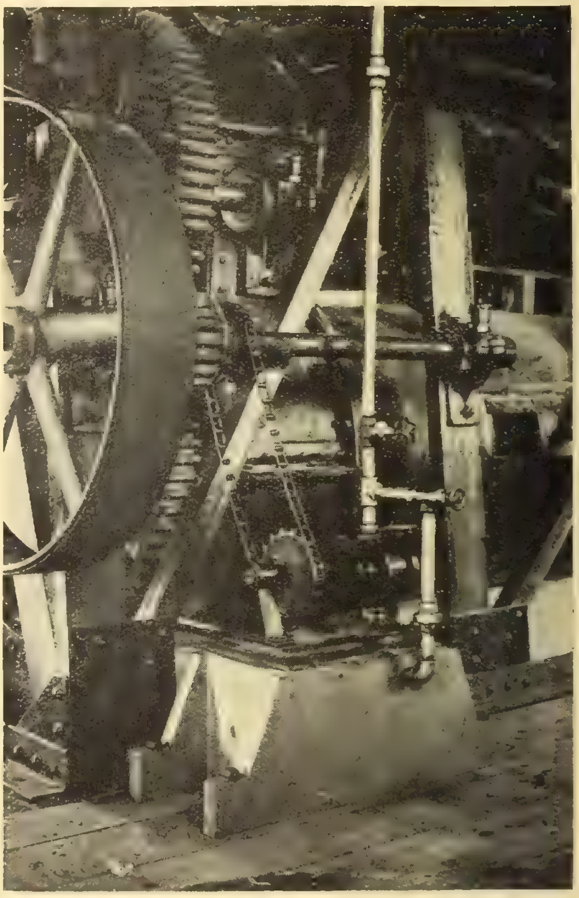
2.—Its purity depends on the purity of the raw material, quick lime.

3.—The plant for its manufacture should be designed and equipped with great care, and by those familiar with its manufacture.

4.—The methods of its use are simple, and it is far more economical and efficient than ordinary lime.

5.—The remarkable growth of the industry indicates that it is a product worthy of careful attention by engineers, contractors, builders, municipalities, manufacturers and concrete users.

Hydrator.



Showing Method of Controlling Water Supply.

Repairing Concrete Floors and Pavements

Almost everyone is familiar with the ugly and unsightly appearance of a badly patched concrete floor or pavement. This result, while partly due to careless workmanship is more often the result of ignorance as to how such work should be handled.

During fourteen years concrete experience, the writer has tried various systems for repair work of this kind, and finds the following method invariably gives the best results:

The usual results of heavy trucking are chuck holes of various sizes, and very often the legitimate wear on a floor brings out hollow places due to different causes, of which poor materials are the principals.

These chuck holes and faulty places should be first chipped out to a depth of at least 2 inches, then well scrubbed with a wire broom, using plenty of water, so that the surrounding concrete is well wetted. A similar mix of concrete to that already used in the floor of medium consistency should now be made and well rammed into the space so as to insure good contact and finished off with a wooden float. After allowing an interval of one hour the repair should be covered with wet gunny sacks. Care must be taken that the mix is not sloppy, as the tamping brings the cement to the surface leaving the bottom part poor. A trowel finish is very often used and is generally the poorest, as it nearly always crazes or cracks and is slippery and best results are always obtained by a wooden float used with a circular motion. The usual tooth roller is not much better than the trowel.

Many writers on concrete recommend that the old surface, after chipping, be treated with an acid wash, any acid having an affinity for lime being used. It is customary for those washes, to use hydrochloric or oxalic acid (Commercial) mixed in varying proportions of from 1 part acid to 4 to 10 parts water. The method of applying is as follows:

1st. Wet the surface thoroughly and apply acid wash and leave on for one hour, then wash thoroughly with a hose, taking care that all the resulting salts are well washed off and the surface well cleaned with the aggregate well exposed. A neat cement paste 1 to 2 inches thick is now applied to the surface when the concrete is immediately placed and finished as above described. Very often a second acid wash is necessary.

This method involves careful supervision as if the acid wash is not well washed off the result is disastrous.

In cold storage warehouses and freezing weather, when the thermomenter drops below 29.3 degrees Fahrenheit, the freezing point of concrete, good results are always obtainable with a little care. The surface after chipping should be well washed with very hot water. The mix should be fairly dry and water used in mixing should be heated to about 75 degrees Fahrenheit. Half an hour after placing the concrete, the patch should be covered with sawdust, dampened with hot water. This covering can be removed on the third day. For outside work, manure is a good protection, first having a layer of sacking, tar paper, or some such material to prevent contact. Salt is sometimes added to the water to prevent damage from freezing, the usual rule being to dissolve 1 pound of salt in 18 gallons of water when temperature is at 32 degrees Fahrenheit and add 1 ounce for each degree of lower temperature. Salt, while not injurious to concrete, always produces efflorescence and is not to be recommended. Calcium chloride is sometimes used in the same proportion as salt and gives about the same results.

All concrete floors and pavements whether new or old should be artificially hardened. This process of induration, while common in England, is but little used in this country. Silicate of soda and potash commercially known as soluble glass being the hardening agent. Soluble glass is manufactured by intense heat from flint and caustic soda and is usually sold as a thick fluid having a hygrometer strength of 1700. It is mixed 1 part silicate to 5 to 8 parts of water and brushed over the surface of the concrete until it can absorb no more. New concrete should be 7 days old before applying it. The result is, the floor becomes denser, 50 per cent. harder and non-porous.

The care of warehouse floors is of more importance than is usually ascribed to it. The floors, after a day's work, should not be swept. They should be first well wetted and the sweeping deferred until the following day. This gives the finer cement particles, worn off by the day's traffic, a chance to set back in the floor, and water is always necessary to keep concrete in good condition.

Repairs to a dam which had been partly carried away were made near Crampagna, France, by the use of reinforced concrete, as described in "La Technique Moderne." The breach was 141 feet long, and a piece of the original masonry stood up above water nearly in the middle of it. Three supports were thus available for a reinforced concrete girder, which was placed immediately above water level. This girder was used to support the top ends of reinforced concrete sheet piles placed at an inclination of about 50 degrees. The bottom ends rested on the river bed. The sheet piles were followed by rubble work, which was finally brought to the proper cross-section of the dam.

A Large Reinforced Concrete Cantilever Girder

In a Boston steel cage building two columns 42 ft. apart on centers at the rear corners are located just within the lot lines and transmit loads of about 325,000 lbs. each to their pils foundations. As there are existing buildings on both sides of the lot and as there are no party wall agreements it was thought best to keep the foundations entirely on the owner's lot and not encroach at all upon adjacent property. Offset concrete piers about 10 ft. wide at the base were required to transmit the colum loads to the foundation piles and were so far eccentric from the columns that it was proposed to support the latter from them on an intermediate double cantilever box girder extending across the full width of the building with pin bearings on cast-iron pedestals about 5 ft. and 7ft. from the ends of the girder.

Such a girder about 44½ ft. long was designed, and together with its concrete covering which completely enclosed it, was about 2½ ft. wide and 4 ft. deep over all, containing about 11 tons of structural steel. The compression flange of the girder was located in the line of the basement floor which provided lateral support for it. The open hearth steel of which the girder was designed was proportioned for unit stresses of 16,000 lbs. in tension, 13,500 lbs. in compression and 10,000 lbs. in shear. Besides the column loads the girder was proportioned to carry a full length concrete retaining wall 12 in. thick and 4 ft. high to support the ends of the basement floorbeams.

The designs were checked by the consulting engineer, Mr. G. H. Brazer, who decided that an economy could be secured by replacing the steel girders with a reinforced concrete girder occupying the full depth between cellar and basement floors, and serving also as a retaining wall, thus making a more simple construction which would not require fireproofing or other protection.

The reinforced concrete girder was therefore built, which occupied all of the space between the tops of the foundation piers and the basement floor across the full width of the building, and at one end was notched on the lower corner to clear the footings of the foundations in the adjacent building. This construction utilized the concrete necessarily required for a retaining wall and for the support of the basement floor and by the addition of reinforcement bars developed compressive strength to support the columns at the extremities and to transfer the eccentric loads to symmetrical distribution on the piers.

The fabrication, transportation and erection of a heavy and expensive structural steel member and its subsequent protection or maintenance were thus eliminated and a single concrete member was constructed at an estimated saving of about $540 over the former design. In addition to the 650,000 lb. of load from the columns the girder sustains a uniformly distributed floor load of about 178,000 lb. and its own dead load of about 124,000 lb. It is proportioned for a maximum compression stress of 650 lb. per sq. in., and shear of 120 lb. per sq. in. on the concrete and for a tension of 16,000 lb. per sq. in. in the steel rods.—Engineering Record.

Driving Two Spiral Tunnels on the C.P.R.

Complete Description by C. S. Gzowski, Vancouver, of an Interesting and Resourceful Piece of Railroad Construction in British Columbia

One of the most interesting of the many grade reduction works that have been undertaken by railways on this continent is that of the Canadian Pacific Railway between Field and Hector, B. C., in the valley of the Kicking Horse river. The original distance was four miles, with a grade of 4.5 per cent (compensated) for about three miles, and 3.5 to 4 per cent. for the remainder of the distance. For safety, three spring switches or catch sidings were introduced, which were normally closed to divert a train onto the spur and opened only when the engineman of a descending train signaled to the switchman that his train was under control.

Owing to the increase in traffic and in train loads it became very desirable to eliminate these extreme grades, but it was a difficult matter to find room for the necessary development of length along the steep sides of this valley. The location finally adopted forms three lines in the valley, connected by loops, and the only way in which these loops could be made was by means of tunnels in the mountain side. The grade is reduced to 2.2 per cent. (compensated) and the length is increased to 8.2 miles. The compensation for curvature is 0.04 per degree, but this is increased to 0.06 per cent. in the tunnels on account of the liability of damp rails reducing the adhesion.

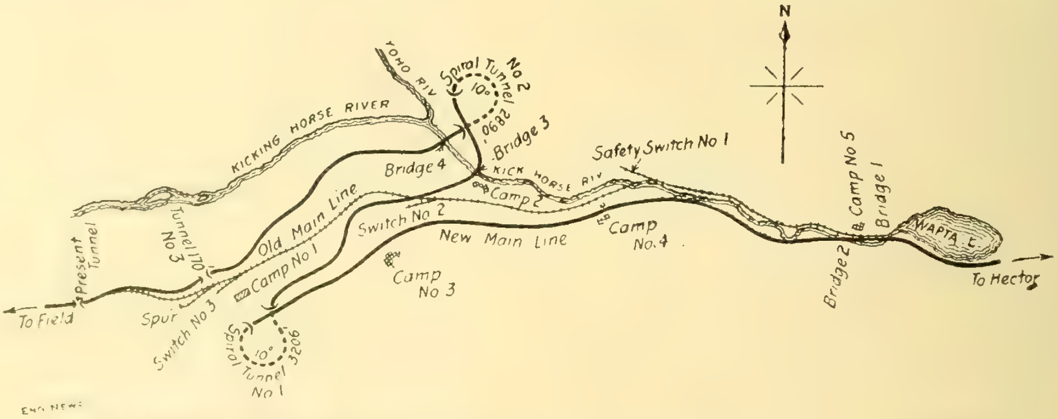


Fig. 1 Map of Grade Reduction Work (Showing the two Spiral Tunnels) between Field and Hector, B. C.; Canadian Pacific Ry.

Fig. 1 shows the old and new location, together with the positions of the tunnels, bridges, construction camps, etc. The contract for this stretch of grade reduction work was awarded to Macdonell, Gzowski & Company, of Vancouver, B. C. Their work included the grading of 8.25 miles of line, two spiral tunnels, one short straight tunnel (710 feet), and four bridges over the Kicking Horse river. The grading was the average heavy rock work.

The most interesting work was the driving of the spiral tunnels. These are on loop curves of 10° (or 573 feet radius), with a grade (as reduced by compensation) of 1.6 per cent. Tunnel No. 1 is 3,200 feet long, and turns an angle of about 234°; the difference in elevation of its portals is about 48 feet. Tunnel No. 2 is 2,890 feet long, turning an angle of about 232°, and having a difference in elevation of about 45 feet at the two portals.

The following information as to the details of the construction work on the two spiral tunnels was furnished Engineering News by Mr. C. S. Gzowski, of the contracting firm.

There was a camp and plant for each tunnel, and the equipment for each plant was practically the same. Table No 1 shows the principal equipment of the plant for both tunnels. The location of the plant for camp No. 1 was put on the old line about 250 feet in evelvation below the portal of tunnel No. 1 and about 800 feet distant from it. The plant was located at this point as there was a small bench on the mountain side which enabled the machinery for the compressor, etc to be handled conveniently from the old railway line. Another reason was that water for operating the plant was obtainable there by digging wells and catching the seepage.

The plant at camp No. 2 was located on the Kicking Horse river about quarter mile beyond tunnel No. 2 and on about the same level as that tunnel, or 150 feet below the old railway line. The plant for this camp was unloaded off the old line and let down a skidway to its location.

The first operation that of excavating both portals of each tunnel was conducted by hand labor, while the machinery at each camp was being installed. By the original plan of operation it was intended to use compressed air drills and do the mucking by hand from a "jumbo" car. After a short trial of this method it was decided to use power shovels (operated by compressed air) at each working end of both tunnels. This necessitated doubling the capacity of the air compressors as well as the boiler capacity.

Method of Tunnel Driving.

The driving of the tunnels was through crystallized limestone, very much distorted, and in places (where badly crushed) timbering had to be used. About 25 per cent. of the length of each tunnel was permanently timbered and enlarged to a sufficient size to allow of a concrete lining being put inside at some future time. In fact, in the untimbered portion, after the character of the ground had been well determined, it was decided to enlarge this also, to permit of a future concrete lining.

The method of driving the rock section which did not require timbering, was to drive a full top heading, keeping it about 10 or 12 feet ahead of the bench (which was kept as vertical as possible), and to shoot the heading and bench at the same time. After a shot was completed, the drillers mucked back from the heading sufficient to set up their drill columns, and then set up and started the drilling. In the meantime, the shovel (run by air) was moved up and started mucking out the last shot. This shovel gang would get cleaned up about the time the drillers had the heading drilled and the down holes of the bench finished. The shovel was then moved back about 150 feet. The drillers then drilled lifter holes in the bench.

When all the drilling was finished, the drills, hose lines and fittings were all moved back. While this was being done, the cut holes in the heading were being leaded for springing. These cut holes were sprung and then fired. Then the side rounds and lifters of the heading, as well as all the bench holes, were shot at one time.

This method of keeping the bench close up to the heading allowed the greater part of the muck of each shot of the heading to be thrown back with the bench muck, which was removed directly by the shovel. Where the timbering had to be carried as the heading was driven, the bench was left about 50 feet back. The heading was shot and then mucked by hand, the material being carried to the bench in cars and then dumped. The permanent timber plates were put in and each segment trimmed off, and then lagged and wedged up.

The bench was always kept as vertical as possible. Before shooting the bench, the wall plate was well supported by blocking up, and the last full-length post protected by old timbers. Just enough bench was shot in each round to allow another full post to be put in, and then this muck together with the muck coming from the heading was cleaned up with the power shovel.

DRILLING.—The arrangement of the drill holes was varied somewhat from time to time as the character of the ground changed. The stratification of the rock as encountered in the different parts of the tunnels varied from nearly horizontal (sometimes dipping up, down or to one side) to practically vertical and parallel to the direction of the tunnel. The formation of the ground at No. 1 tunnel was somewhat uniform, in regard to its stratification, lying with a plane dipping about 20° to the northeast, but as the tunnel made the best part of a circle this was encountered at all angles in the face. The stratification of the ground at No. 2 tunnel had not the same general uniformity as that on the other side of the valley. The hardness of the rock, the distortion and other conditions changed every few feet.

The general plan of the drill holes in the heading was to put in two rows of cut holes about 12 feet deep and sloped so as to nearly meet. The side holes and lifters were about 10 feet deep. The distance of the side holes from the tunnel line was judged by the character of the ground. These were varied as much as 2 feet in line. The bench had a row of down holes on the top, about 8 feet back from the edge and about 10 feet deep; also a row of lifter holes in from the bottom of the face, 12 feet deep, so pointed as to go 1 foot below grade. The aim was to break 8 feet of heading and the same amount of bench each round. It was found necessary to change the number of holes very largely as the rock changed. In tight ground the round of the heading would not break back within sometimes 2 feet or more of the bottom of the holes, while in other ground it might go practically to the bottom.

The rock was of such character that the drilling throughout almost the entire length of both tunnels was most difficult. The formation being crystallized, it was brittle; and having been distorted by upheaval it was in a semi-fractured state. This condition made small wedge-shaped pieces break off in the holes behind the bits of the drills and jam them. Various shaped drill bits were tried, but none overcame the difficulty. The old trick of throwing small bits of iron into the hole was the most effective. The progress of the work was very considerably retarded by the bad conditions for drilling, and although the number of drills was increased to as many as space would permit of working the desired progress was never attained.

MUCKING.—The shovels were the standard No. 20 Marion shovels, with special short booms and dipper arms, and rock dippers with "Panama" teeth. The compressed air was delivered into the boiler, which acted as an additional receiver. The shovels were set as close to one side of the tunnel as possible and had each a special short jack arm to support it on the inner side. There were four shovels, one in each end of both tunnels.

A track of 2-foot gage was used for the cars, and a double track was run in the whole length of the tunnel to a switch, which was kept close up to the shovel. The empty cars came in on one track and the loaded cars went out on the other. The cars were built on the ground and held about 4 cubic yards. One car was switched alongside the shovel and loaded, then run out and replaced by another. It took only about one minute for a loaded car to be run out and another empty switched in place, as the switch was kept as close as possible to the shovel.

The tunnels being on a continuous grade, one end was being driven up grade and the other end down. Where driving down grade, the loaded cars were hauled out by horses and ran back by gravity. Where driving up grade, the loaded cars ran out by gravity (manned by brakemen), and were hauled back by horses.

WATER.—In each tunnel there was considerable water from seepage through the crevices, and small springs were struck in different places. With the ends being driven up grade there was no difficulty, as a ditch at the side of the tunnel took care of this water. In the end going down grade, all the water naturally drained towards the face of the tunnel. To take care of this, a sump hole about 3 feet square and 3 feet deep was put in a few feet back from the face. A pump operated by compressed air kept the water down in the sump hole, discharging out of the tunnel through a 4-inch wooden pipe. A new sump hole was put in from time to time as the face of the tunnel progressed, and occasionally the pump was moved forward as the lift got too great for the suction end.

If anything went wrong with the pump for a short time the tunnel would fill up very rapidly with water. In order to avoid the delay due to this, a second pump was installed, making a duplicate system, so that if anything went wrong with one pump the other could be turned on by merely opening the valves. In the winter considerable trouble was experienced with the discharge pipe freezing near the outlet end in the tunnel. This was overcome by covering the pipe with manure.

ELEVATION.—The elevation at the work being about 5,000 feet above sea level, a certain allowance had to be made in figuring the steam and compressed air plant. A gain was made in generating steam and on the exhaust end of the steam, but there was a loss on the compression of the air and a gain on the exhaust of the air drills and other machines.

WEATHER.—During very cold weather, considerable difficulty was experienced with the freezing up of the air supply pipe lines from the compressor houses to the tunnels. This was due, of course, to the freezing of the moisture condensed from the compressed air. Where the pipes leading away from the compressors were going up a considerable grade there was no trouble experienced, because the moisture condensing out of the compressed air would run back to a warmer part of the pipe. Where the pipes were nearly level or running down grade, they were continually freezing in different places during the very severe snaps. Additional air receivers were put on the air line close to the compressors to further condense out the moisture and also small blow-off cocks put at intervals along the pipe. These methods somewhat reduced the freezing trouble, but did not altogether overcome it.

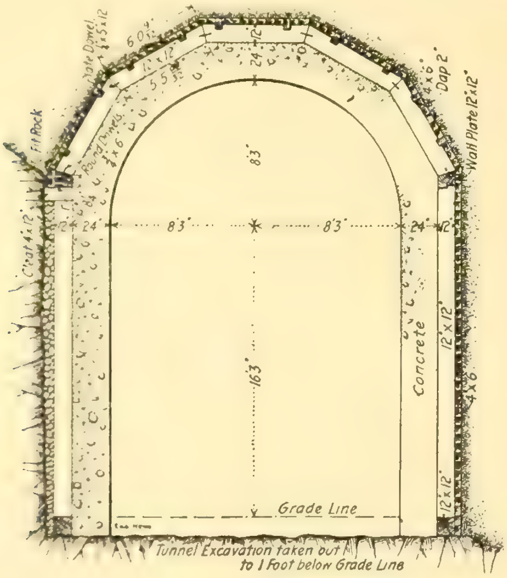


Fig. 2—Cross-Section of the Spiral Tunnels, Showing the Timbering as Arranged to give room for a Concrete Lining

METHOD OF GIVING LINE AND GRADE.—A base line was established between the two portals, which intersected with the tangents (or tangents produced), of the curves on which the tunnel was driven. From this base line all alignment was given by setting out calculated deflections and distances. As a proof of the correctness of these calculations, previous to starting the work these lines were run out on the prairie and they they checked practically exactly. Centres were given from time to time in the tunnels, 20 feet centres as a rule. A table of offsets from the production of these short chords was given the foreman, who was thus able to get his centre at any time from the last two centres. The centres were marked in the roof as well as on the bottom. The levels, of course, did not need any particular plan of action, being carried as in ordinary work, but with great care .

The final result when the headings met was practically exact, the alignments closing within ¾-inch and the grade within a few hundredths.

PROGRESS RECORDS.—Table II. shows the of 8.25 miles of line, two syiral tunnels ,one short monthly progress at each tunnel. At first sight the record does not appear to be very good. As a matter of fact, however, it is considered to show very good progress under the adverse conditions due to difficulties in the drilling, troubles with water, the timbering and the very cold weather in winter.

TABLE I.—PLANT FOR DRIVING THE SPIRAL TUNNELS; CANDIAN PACIFIC RAILWAY.

1. American-Rand cross-compound air-compressor capacity, 1,050 cubic feet of free air per minute. Air cylinder 22 and 13 × 16 inches; steam cylinders, 14 and 24 × 16 inches.

1. Ingersoll-Rand straight-line air compressor; 1,100 cubic feet per min. Cylinders, 20 and 20 × 30 inches.

1 Ingersoll-Sergeant straight-line air compressor; 1,425 cubic feet per minute. Cylinders 24 and 26½ × 30 inches.

8 Fairbanks-Morse duplex pumps; 6 × 4 × 6 inches to 8 × 5 × 12 inches; 6 ram pattern, 2 piston plunger pattern, 5½ × 3½ × 5 inches.

1 Atlantic pump 7 × 4½ × 6 inches.

9 boilers; 2 return tubular, 100-horse power; 4 Jencks locomotive type, 80 horse power; 2 locomotive type, 100 horse power; 1 Brady-Mumphard, 100 horse power.

2 Comstock Climax engines: (1) 7 × 10 inches, 25 horse power; (1) 4 × 5 inches.

1 Little Giant hoist; cylinders, 5 × 7 inches.

1 American hoisting engine with boiler; 25 horse power; cylinders, 7 × 10 inches.

1 General Electric d.c. generator, 25 k.w., 250-volt, 100 amperes.

2 Westinghouse d.c. compound-wound generators, 6 k.w., 125-volt, 48 amperes.

4 Marion steam shovels (operated by compressed air).

22 Canadian-Rand Little Giant rock drills.

6 Ingersoll-Sergeant rock drills.

TABLE II.—RECORD OF PROGRESS ON SPIRAL TUNNELS AT FIELD, B. C., CANADIAN PACIFIC RY.

Month 1908	Ft.		Ft.	
Jan.	34	started one end.		
Feb.	198	started other end.	35	started one end.
Mar.	208		111	only one end.
Apr.	226		122	started other end,
May	277		157	trouble with water and bad ground.
June	244		118	
July	180	trouble with smoke and water.	153	
Aug.	158		107	
Sept.	173		219	
Oct.	165		301	
Nov.	158		277	
Dec.	200		252	
1909				
Jan.	156	trouble with frost.	244	trouble with frost.
Feb.	150		215	
Mar.	215		251	
Apr.	197		287	
May	170	finishing.	63	
June	75			
	3,184	ft.	2,912	ft.

The remarkable growth of Montreal is shown in a statement issued recently from the City Hall. The city now has an area of 40.23 square miles, or of 25,747.45 acres, whereas in 1883 the acreage was only 3,494.

Sand protection for Macadam roads has been demonstrated by tests of the Massachusetts Highway Commission to be effective on ordinary roads where the automobile traffic is not heavy. It has been shown, according to the last annual report of the commission, that a stone road can be preserved by this means at an average cost of 1½ to 2½ cents per square yard per year. This would amount to $140 to $220 per mile.

Inspection of Pipe Sewers

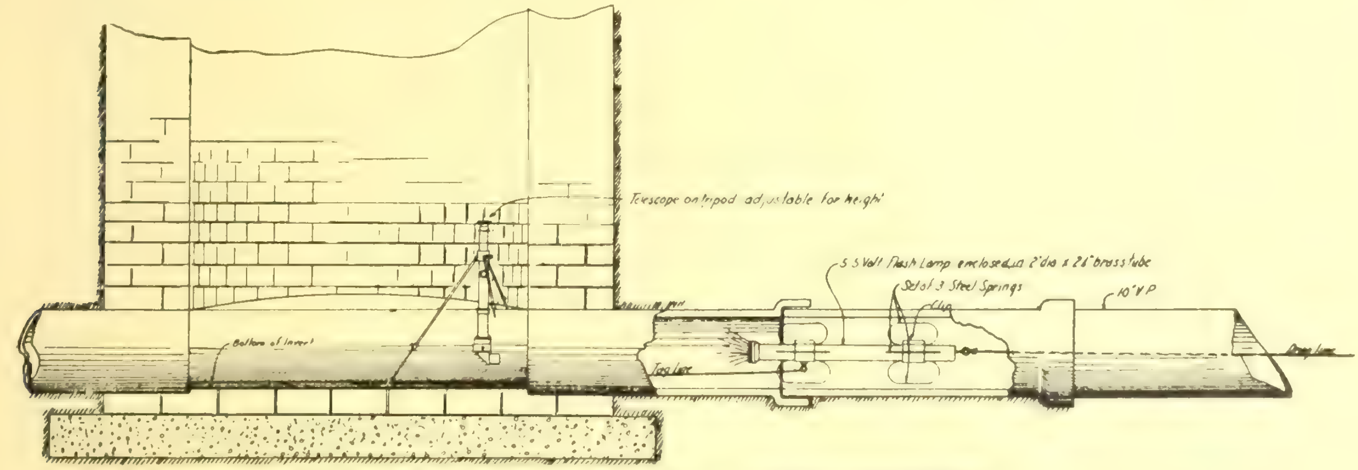
Sewers, like other work constructed by contract, should be thoroughly inspected by a municipal official or agent before being accepted by a city, although such thorough inspection is too often neglected, says the Municipal Journal. Also, all works should be inspected at intervals of a few weeks or months, depending upon the experience as to stoppages and other failures to efficiently perform their functions. In the case small pipe sewers such inspection must be made from the manholes. The more common method of doing this is to use two mirrors, one being held upon the surface and used to reflect sunlight to the second which, held by the inspector in the bottom of the manhole, reflects the sunlight to the interior of the sewer. There are several objections to this, one being that it is not applicable on cloudy days; another, that it requires the inspector to assume an awkward and back-tiring position; moreover the illumination at more than 100 feet from the manhole is generally inadequate.

Mr. W. W. Dixon, who until recently was Superintendent of Sewers of Summit, N.J., has invented and used in that town an apparatus which apparently overcomes these difficulties. The light is furnished by a hand torch carrying a storage battery similar to those which can be purchased at any electric novelty store except that a larger storage battery is employed. This torch is provided with springs just sufficiently strong to support it in position in the center of the sewer. Mr. Dixon proposes to substitute for the dry battery a storage battery located in the manhole and connected to the light by a twin wire, which wire could also be used in place of the cord employed for drawing the torch through the sewer. This twin wire, or a special cord, is attached to the dark end of the torch, by which it is drawn backward through the sewer from one manhole toward a second. A steel tape graduated to 5-foot intervals is also attached to the torch and is paid out from the former manhole, at which the inspector stands, thus enabling him to determine at any time the distance of the torch from that manhole, and thus locate any obstruction or defect which may be revealed.

To avoid the necessity of the inspector's getting down upon hands and knees to look into the sewer a telescope is provided with a power of about 15 diameters, furnished at the object end with a right angle prism so set as to refract to the eye-piece rays received at right angles to the axis of the telescope. This telescope is mounted upon a tripod with legs adjustable as to length, two of which rest upon the benches at the sides of the manhole and the third in the invert of the sewer. The last is furnished with a rack and pinion to permit accurate adjustment of the telescope.. In using, the telescope is set vertical with the prism practically in the axis of the sewer. The telescope is provided with a gauge which is set to read zero when the telescope is exactly vertical, and by setting this gauge at the grade of the sewer which is to be inspected the line of sight will coincide with the axis of the sewer. This last adjustment is perhaps an unnecessary refinement, as the observer can easily adjust the telescope from time to time with the rack and pinion so as to direct the line of sight as desired. The inventor who has applied for a patent on this appliance, has used it for detecting flaws, bad joints, seeping ground water, branch connections whose location is unknown, as well as to inspect new lines of pipe to determine their acceptability before final settlement with the contractor for the same.

Inserting House Connections

Mr. Dixon has also designed a method of making house connections with vitrified pipe sewers where no Y branches have been left for that purpose. In fact, we believe the Sewer Department at Summit has not recently been in the practice of leaving any such connections in new sewers in front of vacant lots, but intends to make the connections wherever it may be most convenient after the buildings have been constructed. The method employed consists in cutting a hole in the pipe where the connection is desired, this hole being made two or three inches greater in diameter than the house connection pipe. As the pipe is well bedded in the bottom of the trench there is little danger of cracking it during the cutting if ordinary care be taken. This is covered with a saddle or half-pipe which is furnished with a regular T or Y hub, which saddle is so placed as to bring the hub opening directly over that cut into the sewer shell. The outside of the sewer pipe is plastered with about ¼-inch thickness of rich cement mortar and the saddle pressed into place. A little mortar wiped on the inside of the inlet opening seals the joint between the saddle and the pipe at this point. The saddles are made by the pipe manufacturers of salt glazed clay in the form of a double branch pipe 16 inches long without a bell, the pipe being scored before burning and being split into two pieces after burning, after the ordinary method of preparing "split pipe." For providing a connection for 8-inch pipe a 10-inch pipe is used for the saddle.


Telescope on tripod adjustable for height
5.5 Volt Flash Lamp enclosed in 2" dia x 21" brass tube
Set of 3 Steel Springs
Clip
10" V.P.
Bottom of Invert
Tow line
Drag line

Use of Torch and Telescope in Inspecting 10-inch Pipe

The Training of the Engineer-Contractor

Vital Subject Discussed by Readers of the Contract Record—Practical Training and its Value—Reports upon Actual Work—Organization

Montreal, November 11th, 1910.

Editor, Contract Record:

I have read with interest, in your issue of November 2nd, Mr. W. R. Harris' article on "The Training of the Engineer-Contractor. There is something suggestive of further expansion in what Mr. Harris says, and the subject of engineering-contracting is a live subject for consideration.

The usual period required for the college part of an enginer's education is four years, during which time the young man is expected to acquire the technical knowledge which will prepare him for his future work. If he is an apt scholar and works conscientiously, under good teachers, he can acquire this knowledge in the four-year period.

Like most other callings, engineering consists of the common sense application of scientific principles. Theoretical knowledge is the basis of an engineer's work, but his knowledge must be broadened, so that theory may be a help to him instead of a hindrance. This result can only be attained by demonstrating clearly to the young engineer the practical application of the theory he is studying.

How this practical application of theory is to be taught in a college is the question. College professors, as a rule, are not practical men, though there are many exceptions to this rule. The value of the dollar is not usually taught in the college, except that theoretical economics of design is taught as far as the course will permit.

The point that Mr. Harris makes is, that the practical economy of execution is not taught, and that it should be taught, and that the commercial side of engineering should receive more careful recognition.

I have always recognized that the college does not turn out an engineer, but an engineering student, who, if he have common sense, will develop into an engineer.

Now a man must "develop" into an engineer. It is a matter of many years of varied experience. No schooling except that of hard knocks will produce the kind of man Mr. Harris is looking for. The college should prepare him to receive and meet hard knocks, let him know they are coming, and not teach him that everything will be serene in the future so long as he understands the graphic analysis of stresses, and other very useful subjects.

But is the college the proper place to teach these practical subjects relating to construction? I think not. There could not be much harm in having the students do the little exercises that Mr. Harris suggests, but I think they would rather put in the time at some athletic exercise, which would do them good.

With all deference to the teaching profession, one handicap that many students have to suffer is the unpractical professor. If the teachers were practical men, students would soon discover the practical application of theory, and would take more interest in their studies. Blind obedience on the part of a soldier is an excellent trait, but give him an idea of the object he is expected to attain, and his interest and vigor will be doubled, and will not be confined to efforts merely to save his own life; in other words he will work more efficiently. Why does not this apply to all classes of students also? Put early before every student the practical application of every rudiment of his education.

Every ambitious engineering student tries to employ a part of his vacation in work of some sort bearing on the profession he seeks to enter. Many colleges use their influence to obtain temporary work for their students during vacation, and this is good practice. Now, is proper use being made by the college of this vacation work of the students? Why not consider the vacation periods as part of the college year? All students cannot get employment perhaps, but all students can use their powers of observation. I would suggest that as the college cannot impart the practical knowledge that Mr. Harris refers to, it should encourage the acquiring of such knowledge in every way possible. And is there a better way than by turning to account the practical knowledge gained by the student during his vacation, and by impressing on him the fact that his work during vacation will be given a certain value in the course he is going through in college?

Suppose a student on vacation, employs his time on a railway location survey, a construction camp, assisting on any form of construction, would it not be a good idea for the college to insist on his keeping such notes on methods and costs as would impress the practical features? At the beginning of the term the student should turn in to the college the information he has gathered in the form of a report. The student who does not secure such occupation can always get access to some work in progress, or to some manufacturing industry, and by using his powers of observation, and by enquiring, he can get a great deal of information which he should report in the same way.

These reports should be given a value, and not neccessarily by the college staff. Let them be submitted to some practising engineer, who may, perhaps, better appreciate these efforts and make suggestions in individual cases as to where improvement could be made,—more in the spirit of encouragement than of criticism.

A method such as this would enhance the interest in theoretical work, would show its application to commercial engineering, would encourage originality, would give the student a chance to display his capacity in the use of English, in writing his report, and would make the year, one whole interesting period of study, instead of two periods of grind as now generally prevails.

The life of the student can and should be made interesting; and the more practical his education is, the more interesting and useful it will be to him, and to those with whom he will associate in future years.

Yours truly,

Henry Holgate.

Should Students Pay for Acquiring Practical Knowledge?

Toronto, November, 15th, 1910.

Editor, "Contract Record":

The idea expressed by Mr. Harris, namely, that more knowledge of practical subjects should be given the young engineers graduating from our engineering colleges, is indeed a splendid one. I am quite willing to agree with Mr. Harris in this regard, but believe, personally, that the college is not the proper place for such training. It seems clear that the young engineer should attend a training school for the express purpose of obtaining that which cannot be secured elsewhere, i.e., a training in applied mathematics and other fundamental subjects in the science of engineering. Further, to meet a practical question with a practical rejoinder:—Why should a student in a given three months be compelled to obtain his "practical knowledge" by paying for the same, when it might be obtained to much better advantage in active work where a remuneration would be received?

The majority of young graduates who have sufficient mental ability to cope with the rigid examination requirements of the modern scientific university are undoubtedly in a position to be moulded into useful engineering assistants after six months experience in any special branch of engineering. However, frequently they do not come up to this requirement, and I am strongly of the opinion that the fault lies, in many cases, with the poor organization of the employers concerned.

A gentleman prominent in the world of technical education, once made a statement to the effect that an engineer's usefulness depended upon his ability to locate information upon short notice rather than upon the actual knowledge he possessed.

This statement applies directly to the condition mentioned by Mr. Harris, that costs and estimating information should be taught in technical colleges. The organization of any contracting or engineering firm should be such that complete information on all subjects can be supplied immediately—even perhaps by a fourteen-year-old office boy. Under such conditions the average young engineer will rapidly become valuable to any concern.

The organization of an engineering-contracting firm should bear inspection upon the following points:—

1. Existence of a simple, direct and reliable cost system.
2. Definite policies on all engineering matters and well-defined instruction regarding the same.
3. The absence of exalted officials whose habit it is to cloud the beginner with mystery, or in other words, who follow the very erroneous policy of "putting it up" to new employees. A little patience and a few concise explanations are things rarely given to a young engineer commencing in a new office.

With the above conditions existing, the introduction of instruction in cost systems (except, perhaps, to a limited extent) seems hardly necessary.

Very truly yours,
R. E. W. Hagarty.

Contract System vs. Day Labor

Moose Jaw, Sask., 14th Nov., 1910.

Editor, Contract Record:

Reverting to the discussion of the above subject, I may say that I think the question resolves itself into a purely local one. While the contract system might be the better in some districts, it would be decidedly disadvantageous to the municipality in others.

Consider the average contractor in Ontario who is properly equipped to handle big work and you will generally find in his employ a competent engineering staff quite capable of assimilating and executing the ideas of the designer. And with competent inspectors to look after the routine work, a good and efficient job is generally the result. A point worthy of note is the competition that exists among contractors in Eastern Canada. An engineer there is always assured of several bids on any work which he proposes to do. This leaves him in a position to reject the bids of incompetent contractors. In Saskatchewan the situation is entirely different. To begin with, we find it difficult to get sufficient tenders to make competition keen. It is not an unusual occurrence to get only one bid on a job; in fact I have advertised work for as long as two weeks and not received a single tender in response. Conditions such as these put the engineer in the position where he must do one of three things:

1.—Award the tender at an exorbitant price.
2.—Award the tender to an incompetent contractor.
3.—Do the work by day labor.

The first alternative should be struck out without any consideration. If the second is followed the corporation must spend extra money for inspection, and the engineer must be in almost constant attendance on the work to direct the mode of procedure and explain detail methods of construction—things that rightfully form part of the contractor's business. Obviously this is not an ideal condition to have existing in the carrying out of public works. If the corporation is required to supply all the technical training required for the work it might as well do the work itself and carry out the original plans and ideas first handed.

We are at present doing work in Moose Jaw by day labor and we find it much more satisfactory than the contract work. I am hopeful, however, that with the rapid growth of the country, competition in contracting and its consequent efficiency will increase. When such a time comes I have no doubt that the contractor's work in Western Canada will establish him in the position where, I believe, he rightfully belongs.

Yours truly,
J. M. Wilson,
City Engineer.

Manufacture of Hydrated Lime

Editor, "Contract Record":

I was much interested in the article on hydrated lime, published in your issue of September 28th. Will you kindly inform me where it is manufactured and what process it goes through to convert it from the stone as it comes from the kiln. Probably there are others who would like this information as well as myself.

Yours truly,
Constant Reader.

Only a small quantity of hydrated lime is manufactured in Canada, compared with the demand. Most of it is imported from the lime district in Ohio, south of Toledo. The process of manufacture is detailed in an interesting article contributed to this issue by Mr. Lucius E. Allen, chemical engineer of Belleville, Ont. In addition to the plants mentioned by Mr. Allen, there is that of the Standard White Lime Company at Guelph, Ont.

Hypochlorite Treatment of Ottawa Water

Ottawa has practically decided upon hypochlorite treatment of its water, pending a decision as to the advisability of bringing in a new supply from McGregor's Lake, or establishing a filtration plant in connection with the existing system. Mr. Allen Hazen's report contains the following extended reference to the subject: "The best amount of hypochlorite of lime to be added would be determined by experiment. Possibly a water with this degree of color would take a somewhat larger quantity than a water with less organic matter. For the present, the estimate on 15 pounds per million gallons, or 50 tons per annum, at $25 per ton, would be $1,250. The cost of applying would be represented by the salaries of four men and something extra for supervision, say $3,500 per annum. The total cost would probably be something like $5,000 per annum. In order to carry out this treatment all the water should be brought to the pumping station through one pipe. There is now one 40-inch pipe supplying water, and a new 42-inch pipe is being built. It was the intention to give these two pipes separate connections with the pumping station. This arrangement would not lend itself conveniently to the hypochlorite treatment. In order to carry out that treatment advantageously both of these pipes should be connected to a new 60-inch pipe at a little distance from the pumping station, say at a distance of two or three hundred feet, where the two pipes could be brought together and the single large pipe carried to the pumping station. I would put a Venturi meter on this pipe so that the amount of water being pumped could at all times be known with certainty. The hypochlorite of lime could be dissolved and controlled in a space in the attic over the present pumping station which is adapted to this use. The [illegible] be carried to the beginning of the 60-inch pipe and would become mixed with the water by the flow through it, and by the flow through the throat of the Venturi meter, so that the water taken to each pump would have its fair share of the substance. Passing through the pumps of course would effect a very thorough mixing. The hypochlorite treatment on present evidence is equal in its effect to the ozone treatment in every respect, and is both surer and cheaper. It would not reduce the color of the Ottawa river water appreciably, nor would it remove any turbidity and sediment in it. Its object would be to remove as many as possible of the bacteria resulting from the sewage pollution of the river. A considerable bacterial purification could be secured in this way. The process is worth installing at once and continuing in use until permanent purification works or a new supply is installed, and I recommend that this be done."

A reduction in the price of cement has resulted owing to a difference between the Canadian Cement Company and the independent manufacturers. At time of writing the price quoted at Toronto for wholesale lots of 1,000 barrels, f.o.b. Toronto, is $1.55—a cut of 5 cents. It is stated that at some points in Canada the price is down 10 cents, and at others even 15 cents. Mr. Alfred Rogers, of Toronto, who represents the independent dealers, states that the independents forestalled the fight and made the first cut.

The Provincial Government has granted a charter with full social privileges to the Engineers' Club of Toronto. The membership of the club will be limited to 500 resident members, 200 non-resident members, 25 life members and 75 associate members. The provisional directors are: Messrs. A. B. Barry, C. M. Canniff, Willis Chipman, John Galbraith, J. G. Sing, J. B. Tyrell, and A. J. Van Nostrand.

The new lock at Sault Ste. Marie is progressing, and it is expected that the excavation for the lock pit will be completed early in 1911. The contract for the concrete will be let during the coming winter and work on this will be commenced in the spring. The MacArthur Brothers Company has the contract for the western section of the approach canal and John Marsch is the contractor for the lock excavation. The work is under the direction of Col. C. McD. Townsend, and Mr. L. C. Sabin is assistant engineer. This new lock (known as the Davis lock) will be 1,350 ft. long between the gates, 80 ft. wide, and 24½ ft. deep below the level of extreme low water. It will be parallel with and adjacent to the two existing locks: the Weitzel lock (1881), 515 × 80 ft., with a depth of 16 ft., and the Poe lock (1895), 800 × 100 ft., with a depth of 21 ft.

An official meeting of the Board of Engineers of the Quebec bridge was held recently at Quebec. The engineers visited the dry dock at Levis, where they examined the caisson which was brought there recently from the site of the bridge for repairs. After a minute investigation into the damage which the caisson had suffered, and for which it was floated, the engineers decided to meet again on the 23rd instant. In the meanwhile a careful study of the caisson will be made. It was stated that the damage to the caisson was of little importance and would not retard the building of the bridge. The actual work of erecting the iron work of the bridge will be begun in the fall of 1911. The work of removing the steel of the fallen bridge is nearly completed, seven thousand tons having already been cleared away, and the cribwork preparatory to laying the caisson is now under construction. Mr. Vautelet explained that there would be three caissons required for the south shore, which would have to be built next summer. According to contract the bridge will be completed between 1914 and 1915.

Canadian Railroad Development

The city of Ottawa proposes to engage Mr. C. F. Tye, consulting engineer, to report upon the plan of the Canadian Pacific Railway for a tunnel under the city and the closing of a section of Rideau canal. There will also be a report upon a general plan for the entrance of all railway lines, present and future, to the city.

The Alberta Central Railway Company, Red Deer, Sask., is to apply to Parliament for an act to enable it to construct a line of railway from Saskatoon easterly to Hudson Bay, with terminals at both Fort Churchill and Fort Nelson. The Alberta Central Railway Company has now under construction a line of railway 70 miles westerly from Red Deer, and 40 miles easterly towards Moose Jaw. Smith & Johnston, Ottawa, Ont., are the solicitors for the company.

The Canadian Northern Railway is understood to have surveys under way for a railway line in the Peace River and Grand Prairie country, striking off the main line just east of Lac Ste. Anne. This new survey will connect with the old survey made to Fort Assiniboine several years ago. The construction of a line into the Peace River country has been contemplated by the Canadian Northern Railway for some time. The Provincial Government has guaranteed the bonds of the company for the first 50 miles of the line.

The blizzard of Nov. 7, which has ushered in the winter in Alberta at least two weeks earlier than usual, has called a halt to practically all railway construction in the Province. About all grading outfits have closed work and have sought winter quarters. This brings to a close a very active year in railway building in the Province. A total of 400 miles has been built, as follows: C. N. R. main line, 40 miles; G. T. P. main line, 80 miles; C. N. R. Calgary branch, 110 miles; Brazeau branch, 35 miles; Goose Lake branch, 25 miles; Landing branch, 39 miles; G. T. P., Calgary branch, 125 miles. Of the 400 miles, 265 were constructed under Provincial Government guarantees.

Personal News and Notes

The value of building permits issued at Ottawa last month is $438,925, as compared with $341,150 for October, 1909.

Mr. F. G. Goodspeed, of St. John, N.B., has been appointed engineer-in-charge of the new Public Works Department at Edmonton, Alta.

Building permits to the value of nearly half a million dollars have been issued at St. Boniface, Man., during the last three months.

Mr. Alexander Morrison, a well-known contractor of Vancouver, B.C., will be a candidate for the mayoralty of that city at the January elections.

There is considerable building activity at Calgary, Alta. It is stated that the construction of no less than six large blocks is to be commenced before December 1.

The Montreal Board of Control have approved the report of Supt. Janin in favor of the construction of a filtration plant and extensive improvements to the aqueduct at a total cost of $5,000,000.

The first annual convention of the New York Cement Show will be held in Madison Square Garden, New York, Dec. 14-20. The meeting will be managed by the Cement Products Exhibition Company, Chicago.

The building permits issued at Victoria, B.C., during 1910 represent a value of nearly $2,000,000. The actual figures for the ten months of the year are $1,962,000, compared with $1,548,000 for the corresponding period of 1909.

A dispatch from Victoria states that three tenders were received for repairing the Smith's Hill reservoir. These ranged from $5,000 to $32,000. All three were rejected. A further report will be made by the engineering department.

A meeting of the Ottawa branch of the Canadian Society of Civil Engineers will be held at 177 Sparks street on the 23rd inst., when Mr. G. B. Hull will read a paper on Irrigation in Western Canada. Mr. H. V. Brayley is secretary of the branch.

The mayor of Smith's Falls, Ont., has been dismissed from office and ordered to pay court costs for selling cement to the contractors for sidewalk construction in that town. It was decided that the transaction was a violation of the Municipal Act.

There is some little discussion at Montreal as to the merits of the ozone purification system. Ozone plants have been installed at various places in Europe and operated with much success. Lindsay's experience does not appear to be a final disposition of the system, after all.

The annual dinner of the Engineering Society of the University of New Brunswick was held at Fredericton, N.B., Nov. 15. Those present included Mr. C. H. Thomas, mayor of Fredericton, City Engineer Feeney and Professors Stone, Cartmel and Miller, of the U.N.B.

According to a statement published last week, the members of the various building unions at Toronto number nearly 9,000. A proposal is now under discussion for the various unions to consolidate their interests by amalgamation. A committee has been formed, with two representatives from each trade union.

It is expected that the Metropolitan Parks Commission of Montreal will submit a detailed report on the proposed tunnelling schemes early next month. It was in regard to these projects that the Montreal Street Railway was granted a charter at the last session of the legislature. The chairman of the Commission is Mr. J. L. Perron.

The death occurred last week of Mr. Alexander Marshall, superintendent of construction on the Parliament Buildings at Toronto. The late Mr. Marshall was well known in eastern building circles, having been engaged on the construction of the City Hall and King Edward Hotel, Toronto, and the Electrical Development Company's works at Niagara Falls, Ont.

At a meeting of the Vancouver branch of the American Society of Civil Engineers, the following officers were elected for the ensuing year: Chairman, Mr. Geo. Webster; secretary-treasurer, Mr. G. K. Dutcher; executive committee, Messrs. E. C. Cartwright, J. C. Kennedy and H. Bayfield. An interesting paper, entitled, "The Influence of Light on Concrete Pipe," was read at this session by Mr. Wm. Dart.

It is stated that tenders will be called, probably in January, for the construction of the first 150 miles of the Hudson Bay Railway, on the section from the Pas Mission to Split Lake. The competing interests will include J. D. McArthur, M. J. O'Brien and the C. N. R. The Canadian Northern will have the advantage of owning a railway line to the Pas, and rival tenderers must figure upon getting in their supplies over the Canadian Northern line to that point.

The contract for the new Collegiate Institute at Smith's Falls, Ont., resulted in a little mix up owing to the unfair conditions attached to the carrying out of the work. The contractor was required to put up a marked cheque amounting to 5 per cent. of his tender and to agree to having the Board retain 20 per cent. of the value of work done each month. The lowest tenderer, realizing the one sided nature of such a proposition, backed out of the job. He would agree to the Board holding 10 per cent. The Board wished to amend the contract to read 15 per cent., but the contractor stood by his guns and the work was awarded to the next lowest bidder on the original conditions.

Canadian City Engineers

Mr. A. K. Grimmer, Medicine Hat, Alta.

The city engineer of Medicine Hat, Alta., Mr. A. K. Grimmer, is a native of New Brunswick, having been born in St. Andrew's in that Province in 1882. At the termination of his high school course he entered the University of New Brunswick, where, in 1904, he graduated in civil engineering. His early experience was obtained in various capacities on the C. P. R. surveys. For a time he was employed as draughtsman on the Transcontinental Railway. After graduating he was appointed chief engineer on the Glenn extension of the York and Carleton Railway, which position he resigned in 1905 to become assistant engineer on the installation of sewers and filtration plant at Fredericton. In May, 1906, he was appointed city engineer of Fredericton, and continued to fulfil the duties of that office until 1909, when he accepted a position on the staff of the University of Manitoba.

Mr. Grimmer has had considerable experience in consulting work on water power development. His investigations in this connection include a report for the J. Gibson & Sons Lumber Co., Limited, on the development of the Nashwash River, N.B., and a similar proposition in Nova Scotia. The town of St. Mary's, N.B., engaged Mr. Grimmer to design their water supply fire protection system.

City Engineer Grimmer of Medicine Hat.

During the time that Mr. Grimmer was city engineer of Fredericton he specialized in water purification and devoted some months to studying the design and operation of filtration plants in the eastern States. For a thesis on original research work in this connection he received the degree of M. Sc. in May, 1909.

Mr. Grimmer was appointed city engineer of Medicine Hat in April of the present year. That the post is no sinecure may be gathered from a partial statement of the city's operations during 1910, the whole work representing a total expenditure of about $300,000. The work includes the installation of about five miles of sanitary sewers and four miles of water mains; the laying of four miles of macadamized streets, 100,000 square feet of granolithic sidewalk, and 1½ miles of plank sidewalk; grading 3½ miles of streets, representing an excavation as well as 20,000 yards of material; installation of an electric light plant; building one gas well to a depth of 1,000 feet and a second to a depth of 2,000 feet; also the construction of a new high school at a cost of $35,000. All this work, except the last named item and the gas wells, has been carried out by day labor under the supervision of City Engineer Grimmer.

New Method of Surfacing Macadam Roads

A new method of surfacing macadam roads to withstand [illegible] traffic, as from automobiles, has been devised by Mr. [illegible] H. Hoyt, for experiments under way at Ithaca, N.Y., as a part of the road experiments being carried on by the U. S. Office of the Public Roads and Cornell University jointly. This method of Mr. Hoyt's is described in a contribution to "The Cornell Civil Engineer," and is the use of a "prepared filler." It was devised after a study of the effect of automobile traffic in destroying ordinary macadam by loosening up the stone of the road metal, so that the fine material which bound the coarser stone together was easily driven out or blown away. The idea of the prepared filler is to secure a binder substitute for such finer material in the top course only. The bottom courses of the road have been built and rolled as for an ordinary macadam. The top course of stone was laid as usual, but before rolling this was covered with a layer of prepared filler made from stone chips, sand and bituminous material, heated and mixed thoroughly in a concrete mixer. This layer, about 1 1-2 ins. in depth, was harrowed in with a spike-tooth harrow until the top course stone began to appear through the filler. The road was then rolled until it was firm, and on one section a light paint coat of bitumen was applied, which was then covered with stone chips and rerolled. On a second section a thin surface coat of about 1-2 in. of the prepared filler was spread and the road rerolled. It stated that not as much difficulty was encountered in properly building the road metal by the penetration method of applying the bitumen.

Paint Coatings for Concrete

The use of cement concrete for structural purposes has already become world-wide, and it is increasing at a rapid rate. Heretofore little attention has been paid to coatings for concrete. Enough time has now elapsed to show that cement concrete alone is not as durable as might be wished partly because the cement either contains free lime or develops free lime within itself, after setting. Furthermore, concrete in order to compete with other structural materials has had to be economically handled and roughly finished, and its resulting unsightly appearance has detracted from its desirability. It is therefore clear that there is great necessity for both protective and decorative coatings for concrete. The problem of waterproofing concrete is being studied from several standpoints besides that of applying protective coating. For instance, the endeavor to reduce the voids in concrete to a minimum, as well as to obtain unformly finely ground cement and to eliminate the tendency of the cement to form free lime in setting, are all absolutely necessary steps in the production of a water-proofed concrete and are the special business of the cement manufacturer and engineer of construction to work out.

Much experimental work is under way with regard to waterproofing concrete by means of the addition of various foreign substances in small quantities to the aggregate. Some of these materials are of mineral composition and others are organic. Many compounds are now on the market, but the composition of most of them is not published. Some analyses have been made recently on a series of compounds widely advertised for use in waterproofing, strengthening, or decorating concrete. Among the materials contained were stearic acid compounds, gums, waxes, soaps, mineral chlorides, inert pigments, and asphalt derivatives. Much interesting information is given regarding the compositon of such compounds, although the names of the particular compounds are not given. The possibility of ultimate deleterious effects on concrete from the use of these internal waterproofing materials is a subject for joint study by engineers and paint chemists. In addition to proving the advantages of such materials as water excluders, it should be determined whether they may corrode the steel used in reinforcing concrete or whether they may affect the set and tensile strength of the cement itself.

It is particularly the province of the paint chemists to study the subject of paint coatings for concrete. Oil coatings have been found to be badly affected by the free lime present, which causes saponification and subsequent solution of the saponified coating. The porosity of cement or concrete surfaces causes an absorption or suction effect that renders it necessary to apply to a given area three or four times as much paint as would cover an equivalent area of wood. Two very important lines of investigation are therefore suggested—the neutralization of the free lime in the cement and concrete and the proper filling and treatment of the pores of the concrete—in order to prevent the suction of any paint that may be applied later.

Life of Metal Lathing

The question is often asked: "How long will metal lathing last under ordinary conditions and in ordinary building?" This is hard to answer, inasmuch as a great deal depends upon the quality of the material that constitutes the fabric, the process of manufacture, and the method of applying the plaster.

For three-quarters of a century prior to the last decade, a wire lathing was quite extensively used in the construction of high-class structures in Europe and America, especially in the United States. These structures have been replaced since by larger and more modern buildings and in the process of demolition, it has been found that this wire meshing was in apparently as good a state after thirty or forty years, as when installed.

A couple of years ago, the Fifth Avenue Hotel, on Broadway, New York, was demolished to make room for a commercial structure, and the wire lathing there was found in as good a state of preservation as when installed, fifty years previous. A year or so previous to this, the Boston Theatre, then one of the oldest buildings of its kind in the United States, was demolished, and the wire lathing there was found in excellent shape. Now, why was this lathing practically imperishable in these buildings ? The reason is that, the strands of the mesh were thoroughly imbedded in the plaster slab. That is the solution of the whole problem: Metal lathing properly protected from rust before installation by a coat of paint or, preferably, of zinc or galvanizing, that is thoroughly imbedded in the plaster, will outlast any building in which it is used.

This wire mesh was exclusively used in the United States until about twenty years ago, but the consumption was naturally curtailed by the comparatively excessive cost over wooden lathing, until ingenuity conceived the idea of manufacturing what appeared to be a wire mesh out of high-class sheet steel. This was the birth of expanded metal, which has revolutionized lathing and plastering in recent years, and made possible the erection of thin fireproof partitions, suspended ceilings, and a thousand and one utilities, where heretofore they had been great problems.

Great care should be exercised, however, in selecting the quality of the lathing. If circumstances will permit it, galvanized lathing should be specified in all cases, more especially in Western Canada, where wood fibres and gypsum plasters are used.

Mr. E. D. Hofeller, of Buffalo (manager of the Roebling Construction Co), who has probably had as much experienee in fireproof construction as any man in America, asserts that any metal lathing, the strands of which are less than 28 B.W.G. in thickness, is not fireproof, and this statement is worthy of consideration. If the architect and builder will keep before them the foregoing facts, they can specify metal lathing with every assurance of satisfaction and success.—Contributed.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"The durability of a building is the gauge of its value from an economic standpoint."

—The Philosopher of Metal Town

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality OLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1033

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

FOR CONVEYING AND TRANSMISSION

Scandinavia Belt is considered the best Conveyor Belt that has ever been put on the market, for conveying Ore, Rock, Cement, Clay, etc.

It is not made in plies, and will not come apart.

Equally good in wet and dry places.

This illustration shows 20" Extra Stout Scandinavia Belting for conveying Cement.

Write for Bulletins, price lists, and discounts.

Federal Engineering & Supplies
284 Yonge Street, TORONTO Limited

AGENTS: Power Economics Ltd., Montreal. McDougall Hardware Co., [illegible]
Marks-Clavet-Dobie Ltd., Pt. Arthur. Great West Saddlery Co., Calgary.

Agents Wanted in Other Cities.

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.

Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:

Drummond Street - - SHERBROOKE, QUE.

The

Phœnix Bridge & Iron Works

MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. [illegible] Residence P. [illegible]

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds

(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.

Limited

TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

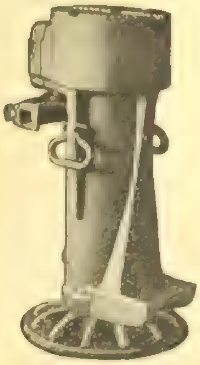
Jamieson Lime Company

Renfrew, Ont.

White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use



Made by practical Jack Builders. Material best grades of [illegible] iron and steel. Fully guaranteed as to durability and efficiency. [illegible] together with the design and [illegible] construction [illegible] and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

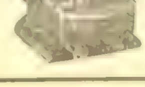
To any responsible Firm or Railway in Canada one of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company

Waterville, Que.

Stock carried by F. H. Hopkins & Company Montreal



The Original

MARSH - PAUL AIR VALVE

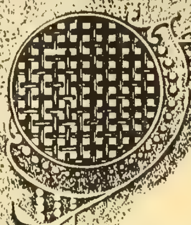
Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our WINDOW GUARDS

Insist on having HARD STEEL WIRE

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone Company, Guelph

from the hardest substances available

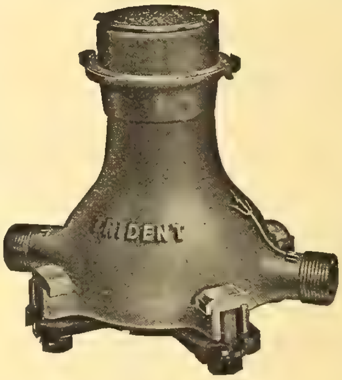
Write the

Corinthian Stone Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

Manufacturers of the well-known



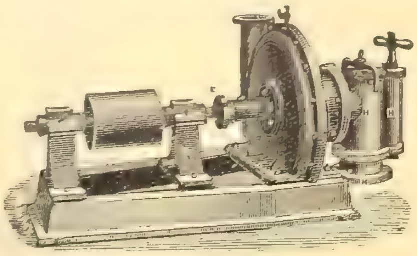
TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

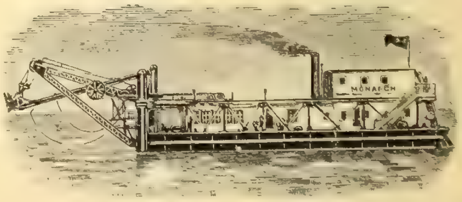
M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



THE WARMEST SHEATHING—WIND AND FROST PROOF
Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal. Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established 1882

THE COMMERCIAL

The Weekly Financial Commercial & General Trade Newspaper of the Great West.

Winnipeg Manitoba

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of absorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.
Limited

Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co. Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt & Co. Engineers
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Sewer and Culvert **Pipes**

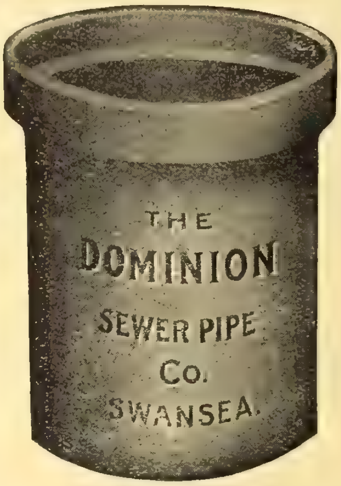
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed
Sewer Pipe
in the WORLD

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12" 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW, President. RYLAND H. NEW, Vice-President.

Our Success Depends on Satisfied Customers

We thoroughly appreciate the above statement and act accordingly. We have built up an immense business simply because we have kept faith with our customers both small and large alike. The appearance of our product, our delivery and careful loading have won for us a good name.

We guarantee our goods to be satisfactory.

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

The Calkins Tile & Mosaic Co., Limited

458 Bleury Street,
Montreal

Tiles
Mosaics
Ceramics
Quarries
Marbles

We handle all classes of work from the largest contracts to the smallest requirements of the marble and Tile trade. Write us for prices.

The Hamilton Steel & Iron Co. Limited
Hamilton - Canada

ROUNDS, SQUARES,
TWISTED SQUARES,
MAXWELL
DEFORMED BAR

BAR IRON
PIG IRON
FORGINGS
R.R. SPLICE BARS
TIE PLATES, SPIKES, AXLES

STEEL BARS
for Reinforcing
Concrete

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

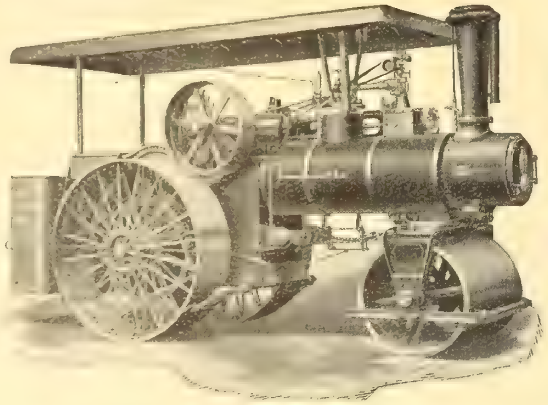
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis.. U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.

Toronto Agent
A. P. STEWARD - Builders' Exchange

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Place
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S,P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.

Consultations, Reports, Plans.

Suite 26-27, Flack Block, **Vancouver, B. C.**

JAMES TAYLOR

Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

**Consulting, Civil and
Sanitary Engineers**

General Municipal Engineering

Specialties: { **Waterworks, Sewerage
and Electric Lighting.**

Toronto and Winnipeg
John Galt John Haddin

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

**"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.**

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

**Building Granite, Granite
Setts, Curbing, Etc.**

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for ɔox lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i........	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i........	4.25	3.50	6.75	5.50
50 u. i........	4.75	4.25	8.75	6.50
60 u. i........	5.00	4.75	10.00	7.50
70 u. i........	5.25	5.25	11.50	8.50
80 u. i........	5.75	6.00	12.50	9.50
85 u. i........	....	....	14.00	10.50
90 u. i........	....	....	16.50	11.50
95 u. i........	....	....	18.00	13.50
.00 u. i........	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, 2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 0 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

'loor Tile—Ceramic, any color, ¾-inch square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
'loor Tile—½-inch square, 65 cents.
Vall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
'itreous Tile—All sizes, according to color, 55 to 65 cents.
lazed—White, 6 x 3 inches, 55 cents per square foot.
latt—Dull finish colors, first, 70 cents.
apping Coves and Corners, special quotations to suit requirements.
palite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
hite glass, installed, 6 x 3 inches, 80 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

tandard compression work, 65 per cent.
igh grade compression work, 60 per cent.
uller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
latway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
o. 4 compression bath cock ....net $1.65
o. 4½ Fuller's ....net 2.25
quare head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

ot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

ad pipe, 30 per cent. off; lead waste, 30 per cent. off caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

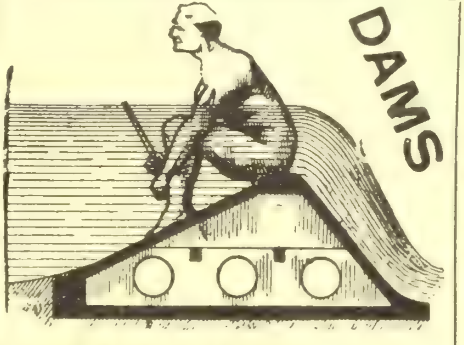
(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, $1.05 per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Warnken Hardware Company, Limited, Winnipeg, Man., capital $25,000. Incorporators: Arthur T. Warnken, merchant; Arthur R. Taylor, physician, and Thos. W. Taylor, manufacturer, all of Winnipeg.

The B. C. Gazette gives notice of the incorporation of the following companies: Street, McRae & Lumsden, Limited, capital $10,000, incorporated to carry on a general construction business. Canadian Timber Company, Limited, capital $1,000,000; Pacific Towing & Contracting Company, Limited, capital $10,000; Colonial Lumber & Paper Mills, Limited, capital $2,000,000; Poulin Lumber Company, Limited, capital $100,000; A. B. C. Motor Company, Limited, capital $25,000; Upper Moyie Electric Company, Limited, capital, $50,000; Imperial Builders, Limited, capital $100,000; the Hago Timber & Investment Company, Limited, capital $50,000; B. C. Hydraulic Power Company, Limited, capital $10,000.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
The Foundry,
Galt, Ont.
Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concrete

Alsen's Cement

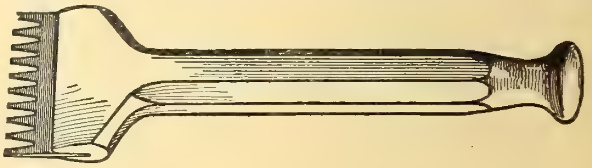
was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.



The
"Simplex" Stone and Marble Cutter

Does away with sharpening of tools. When the teeth are worn replace with a new blade. The new blades are cheaper than sharpening, and give perfect satisfaction.

We also supply double tooth adjustable cutters for stone planing machines.

Bailey-Underwood Co., Limited, New Glasgow, N.S

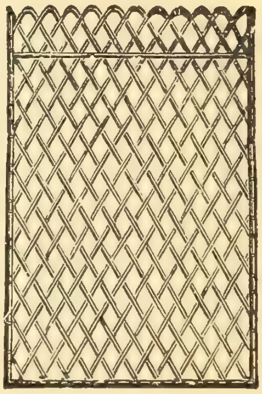
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

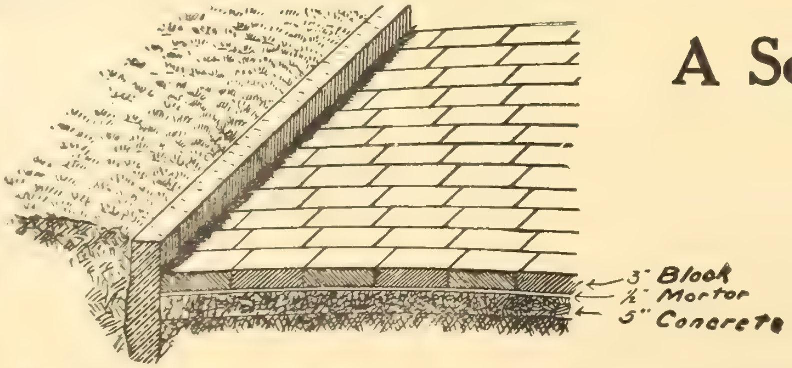
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?

PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, its officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

1200-1210 Morton Bldg. - CHICAGO, ILL.

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

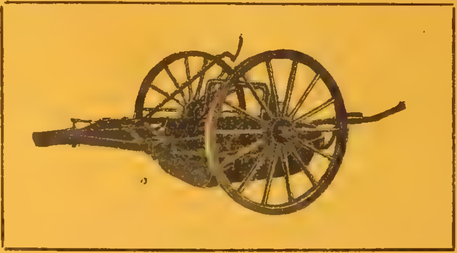
New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

"Some Equipment With Merit"

FOR THE CONTRACTOR



"Kilbourne & Jacobs" Pressed Bowl Wheelscrapers

are the very best that can be purchased anywhere. They are the only perfect wheelscraper. The Best, strongest and easiest working Scraper ever put on the market.

We carry a full stock of all sizes for immediate shipment

"Columbus" Scraper

"K & J" DRAG SCRAPERS

In all sizes

"Boss" Scraper

Our scrapers are the leading drag scrapers everywhere. All our scrapers are absolutely seamless throughout and are superior to any others upon the market.

We want your inquiry when in the market—Prompt shipment from stock

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec   Dunn Bros., Winnipeg   Ritchie Contractors Supply Co., Vancouver

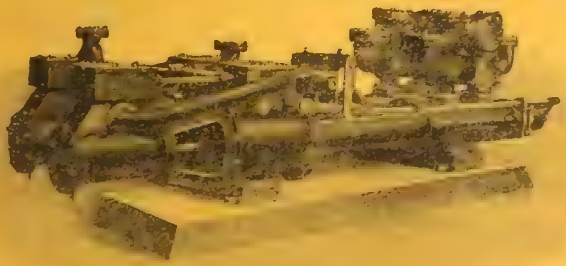
Vol. 24 Toronto, November 30, 1910 No. 48

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.



WRITE FOR CATALOGUE

The **Smart-Turner Machine Company**
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

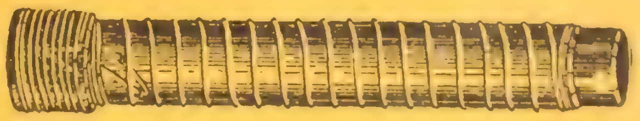
The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works : Don Speedway
Bending Works : 209-213 Victoria Street, TORONTO

Rand Quality Machines

AIR COMPRESSORS
ROCK DRILLS
HAND HAMMER DRILLS
TEMPLE ELECTRIC-AIR ROCK DRILLS
CALYX DIAMONDLESS CORE DRILLS
SUBMARINE ROCK DRILLS
SHEET PILE DRIVERS
DRIFT BOLT DRIVERS
IMPERIAL SAND or CONCRETE RAMMERS
IMPERIAL RIVETTERS
COMPRESSED AIR PUMPING SYSTEMS

Every machine here mentioned has back of it not only a record of success but the reputation of the largest pneumatic machinery manufacturers in Canada.

CANADIAN RAND CO., LIMITED
Commercial Union Building, MONTREAL, QUE.
Toronto, Cobalt, Winnipeg, Rossland, Vancouver, Halifax



Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.
One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work	Page
Canada Wire Goods Mfg. Co	19
Dennis Wire & Iron Works	10

Belting	
Federal Engineering & Supplies, Ltd	47

Boilers	
Inglis, John	22
Jenckes Machine Co.	2
Leonard & Sons, E	49
Marsh & Henthorn	53
McDougall Caledonian Iron Works	29
Mussens Limited	30
Taylor-Forbes Co	15
Waterous Engine Works Co.	

Brick	
American Enamelled Brick Co.	
Canadian Pressed Brick Co	51
Don Valley Brick Works	7
Hamilton Pressed Brick Co	10
Milton Pressed Brick Co	
Port Credit Pressed Brick Co.	51
Toronto Pressed Brick Co.	

Bridges (Steel)	
Canadian Bridge Co.	50
Cleveland Bridge Co.	50
Dickson Bridge Works	
Dominion Bridge Co	50
Phoenix Bridge and Iron Works	51
Pennsylvania Steel Co.	50

Builders' Hardware	
Taylor-Forbes Co.	15

Cement	
Alsen Portland Cement Co.	58
Britnell & Co	18
Bremner, Alex	55
Canada Cement Co	3
McNally & Co., W.	51
Morrison & Co., T. A.	56
Rogers, Alfred	4
Rogers Supply Co.	29

Conduits	Page
Conduits Co., Limited.	55

Concrete Pipe	
Lock Joint Pipe Co.	

Concrete Mixers and Machinery	
Canada Foundry Co.	13
Cropp Concrete Machinery Co.	6
Goold, Shapley & Muir	9
Hopkins & Co., F., H.	60
Jenckes Machine Co.	2
London Concrete Machinery Co.	21
Mussens Limited	30
Morrison & Co., T. A.	56
Rogers Supply Co.	29

Concrete and Steel Reinforcements	
Ambursen Hydraulic Construct'n Co.	57
Buffalo Steel Co.	19
Canada Wire Goods Mfg. Co.	19
Hamilton Iron & Steel Co.	
Trussed Concrete Steel Co.	54

Contractors' Plant	
Beatty & Sons, M.	19
Factory Products Limited	
Hepburn, John T.	17
H. & E. Lifting Jack Co	
Hopkins & Co., F. H.	60
Katie Foundry Co.	57
Marsh & Henthorn	47
Meaford Wheelbarrow Co	9
Mussens Limited	30

Crushers (Stone and Rock)	
Hopkins & Co., F. H.	60
Jenckes Machine Co.	2
Mussens Limited	30
Morrison & Co., T. A.	56

Corrugated Iron	
Galt Art Metal Co.	20
Metallic Roofing Co.	53
Metal Shingle and Siding Co.	20
Ormsby, A. B., Limited	5
Roofers Supply Co	55

Contractors	Page
McIlwraith, Jas. A.	56
Nadel & Adler	56

Drills	
Beatty & Sons, M	51
Canadian Rand Co.	1

Deafening Felts	
Cabot, Samuel, Inc.	51

Drilling Contractors	
Harvey, J.	57

Dredges	
Beatty & Sons, M	19

Engines	
Canadian Boving Co.	2
Inglis, John	22
Jenckes Machine Co.	2
Leonard & Sons, E.	51
Mussens Limited	30
Waterous Engine Works Co.	

Excavators	
Harris, J. W.	11

Electrical Apparatus and Supplies	
Factory Products Limited	
Northern Electric & Mfg. Co.	34

Engineers (Civil and Mechanical	
Barber & Young	56
Chipman & Power	56
Bowman & Connor	56
Farmer, John T.	56
Fuce, Edw. O.	56
Galt Engineering Co., John	56
Glaubitz, H. J.	56
Hunt & Co., Robt. W.	51
Inglis, John	22
Kennedy, Jas. C.	56
Lea & Ferguson	56
Mace, T. Harry	56
Mitchell, C. H.	56
McRae, John B.	56
Moore & Scollan	56
Taylor, James	56

Fire Apparatus	Page
Factory Products Limited	
Morrison & Co., T. A.	56
Seagrave, W. E.	62

Fireproof Doors and Windows	
Douglas Bros	14
Mussens Limited	30
Ormsby, A. B.	5

Gauges, Steam, etc.	
Marsh, Jas. P.	21

Granite and Marble	
Laurentian Granite Co.	56
Missisquoi Marble Co.	
Rogers Supply Co.	29
Smith Marble & Construction Co.	

Glass	
Chance Brothers & Co.	12
Consolidated Plate Glass Co.	
Luxfer Prism Co.	2
Thompson & Co., B. & S. H.	12
Toronto Plate Glass Importing Co.	1

Heating Apparatus	
Jenckes Machine Co.	2
Leonard & Sons, E.	51
Taylor-Forbes Co	15

Hoisting Machinery	
Beatty & Sons, M.	19
Factory Products Limited	
Inglis, John	22
Jenckes Machine Co.	2
Hopkins & Co., F. H.	60
London Gas Power Co	59
Marsh & Henthorn	53
Mussens Limited	30

Hydrants	
Canada Iron Corporation	55
Gartshore-Thomson Pipe Co.	54
Kerr Engine Co.	

Interior Fittings	
Lickleys Limited.	16

Lime	
Christie, Henderson & Co.	17
Jamieson Lime Co.	19

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345
28 King Street West, TORONTO

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & Co. Ld.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

STRONGER.

CHEAPER.

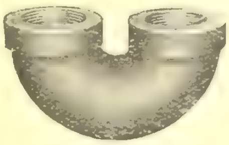
AN IMPROVEMENT ON CAST IRON MAINS.

MADE UP TO 40 FEET IN LENGTH.

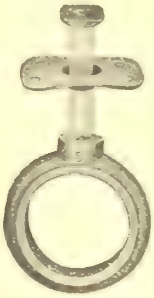
51 VICTORIA SQUARE,
MONTREAL.

RELIABLE

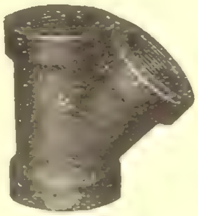
Semi Steel Fittings



RETURN BEND

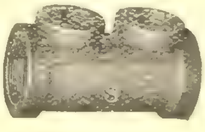


PIPEHANGES

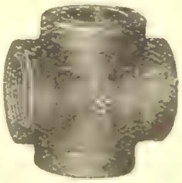


Y BRANCH

REDUCER



HEADER



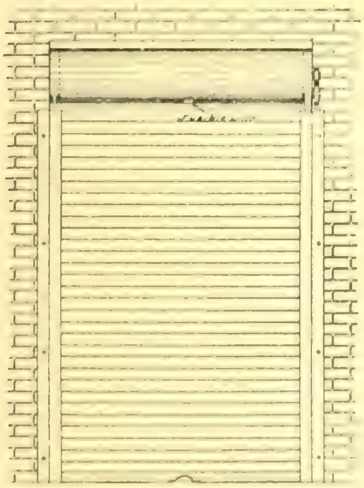
CROSS

A fitting for every purpose
TRY THEM

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

A Really Fireproof Rolling Steel Door

is our Patented Rolling Steel Door. This was demonstrated in Geo. H. Hees Son & Co., Ltd., Fire in Toronto. They have our Rolling Steel Doors on their Freight Elevator Shaft. Their Fire started on the top flat. They say of it "The **Rolling Steel Door** in the rear elevator shaft **withstood the flames** without bulging, warping or getting out of position and kept the flames from travelling down the elevator shaft." Specify our Patented **Rolling Steel Door.** It has everything in its favor.



Experts in Fireproof Windows, and Doors.

A. B. ORMSBY, Limited

Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish — Page

[illegible] .... [illegible]
Batts Limited 10
[illegible] Ltd .... [illegible]
Eaton & Sons, J. R. 21
Georgian Bay Shook Mills .... [illegible]
Rhodes Curry & Co
[illegible] Floor Co 58
Seaman Bros. .... [illegible]
[illegible] Co 18
Woodstock Lumber Co. 58

Metal Lath

Galt Art Metal 20
Metallic Roofing Co 47
Noble C. W. 20

Meters

Hopkins & Co., F. H. 60
Neptune Meter Co. 19

Paving and Paving Materials

Dominion Carbolineum Works.
Metropolitan Paving Brick Co. 21
Ontario Asphalt Block Co. 58
Silica Barytic Stone Co., of Ontario.. 57

Plaster

Albert Mfg. Co. 15
Britnell & Co 18

Pipe

Canadian Pipe Co. 54
Dominion Wood Pipe Co. 9
Gartshore-Thomson Pipe Co. 54
Munderloh & Co. 5
Municipal Construction Co. 16
National Iron Works 55
Pacific Coast Pipe Co. 1

Power Engines

Inglis Co., John 22

Paints and Varnishes

Cabot, Samuel, Inc. 49
Glidden Varnish Co. 32
International Varnish Co. 15
Paterson Mfg. Co. ....

Pile Driving — Page

Lincoln Construction Co. 48

Pumps and Pumping Machinery

Beatty & Sons, M 19
Goulds Pump Co. 59
Hopkins & Co., F. H. 60
Inglis Co , John 22
Leonard & Sons, E 49
Martin Steam Pump Co. ....
McDougall Caledonian Iron Works, John 29
Mussens Limited 30
Ontario Wind Engine & Pump Co. 19
Smart-Turner Machine Co. 1
Waterous Engine Works Co. ....

Roofing Materials

Barrett Mfg. Co. ....
Galt Art Metal Co. 20
Metallic Roofing Co. 47
Metal Shingle & Siding Co. 20
Noble, Clarence W 20
Rogers Supply Co. 29
Roofers Supply Co. 55

Railway Supplies

Factory Products Limited ....
Gartshore, John J. 56
Hopkins & Co., F. H. 60
Mussens Limited 30

Road Machinery

American Road Machinery Co. 10
Case Threshing Machine Co. 54
Climax Road Machine Co. 18
Morrison & Co., T. A. 56
Mussens Limited 30

Sewer Pipe

American Sewer Pipe Co. 52
Britnell & Co 18
Canada Iron Corporation 55
Dominion Sewer Pipe Co. 52
Gartshore-Thomson Pipe Co. 54
Hamilton & Toronto Sewer Pipe Co. 53
Lock Joint Pipe Co. ....
National Iron Works 55
Ontario Sewer Pipe Co. 14
Rogers Supply Co. 29
Standard Drain Pipe Co. 52

Sand

Rogers Supply Co. 29

Stone — Page

Britnell & Co. 18
Christie, Henderson & Co. 17
Consolidated Stone Co. ....
Contractors' Supply Co. 18
Corinthian Stone Co. 50
Crushed Stone, Limited 53
Doolittle & Wilcox 55
Hagersville Contracting Co. 5
Laurentian Granite Co. 56
Maloney John 51
Morrison & Co., T. A. 56
Myers, Oakley 53
Rogers Supply Co. 29
Roman Stone Co 17
Sackville Freestone Co. 11

Submarine Driver

Roulean, Joseph N. 57

Structural Iron and Steel

Buffalo Steel Co. 51
Dominion Bridge Co. 50
Hamilton Iron & Steel Co. 53
MacKinnon Holmes & Co. 51
Pennsylvania Steel Co. 50
Phoenix Bridge & Iron Works 51
Reid & Brown 56
Salter, W. H. 51

Shovels (Steam)

Beatty & Sons, M. 21
Canada Foundry Co. 13
Hopkins & Co., F. H. 60
Mussens Limited 30

Shingle Stains

Cabot, Samuel, Inc. ....

Slate

Roofers Supply Co. 55

Steel Shingles and Ceilings

Galt Art Metal Co. 20

Smoke Stacks

Leonard & Sons, E. 49

Safes and Vaults — page

Taylor, J & J 51

Stone Cutters

Bailey-Underwood Co. 58

Sheathing Papers

Cabot, Samuel, Inc. 49

Telephone Supplies

Northern Electric & Mfg Co. 32

Tiles

Smith Marble & Construction Co...

Tanks and Stand Pipes

Inglis, John 22
Jenckes Machine Co. 2
Leonard & Sons, E. 49
Marsh & Henthorn 47
McDougall Caledonian Iron Works.. 29
Ontario Wind Engine & Pump Co.. 19

Valves

Canada Iron Corporation 55
Gartshore-Thomson Pipe Co. 54
Kerr Engine Co. ....
Marsh & Co, Jas. 19
Standard Fitting & Valve Co 5

Ventilating System

Gardiner & Gaskill ....

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc. 49

Wire Rope

Dominion Wire Rope Co. 60
Greening Wire Co., B. 58
Smith, Thos. & Wm. 8

Wire Guards and Screens

Canada Wire Goods Mfg. Co. 21

Water Wheels

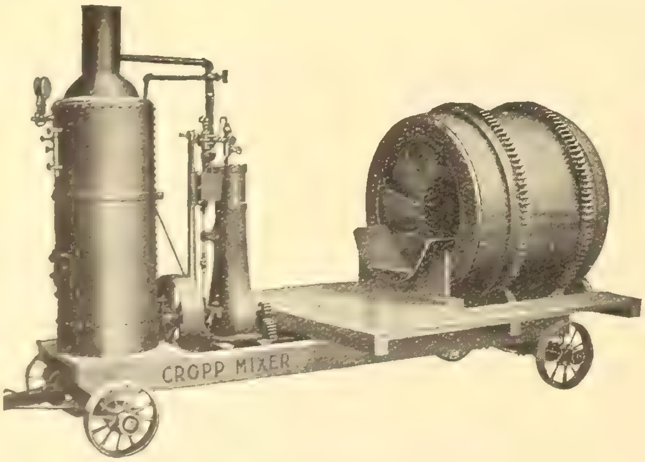
Canadian Boving Co. 2

Water Power Plant

Escher Wyss & Co. ....

The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

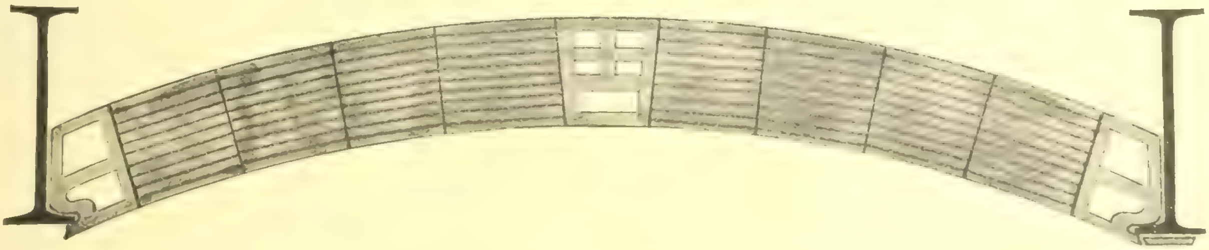
Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering
Arches

Furring
Blocks



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick
Vitrified Brick
Enamelled Brick
Wire-Cut Brick
Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO
Montreal Agent: David McGill, 206 Merchants Bank Chambers

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

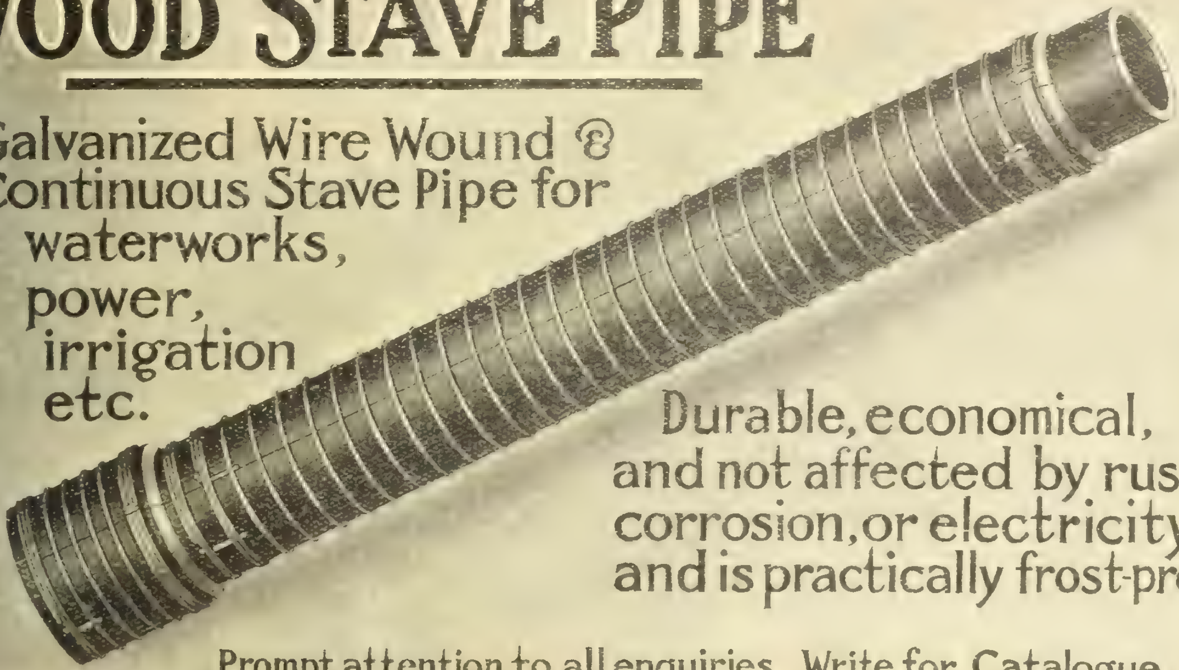
Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

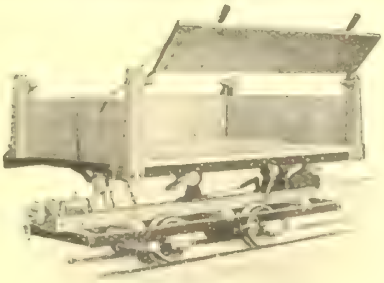


Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

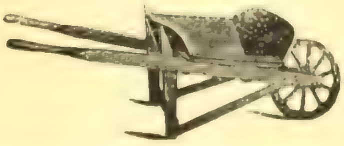
The
Meaford Wheelbarrow Co. Limited
MEAFORD, ONTARIO



Manufacturers of Contractors' Supplies, etc.

WHEEL SCRAPERS—Pressed Bowl and Square Box.
DRAG SCRAPERS—Pressed Steel, Handles on top or sides, with or without runners.
DUMP CARS—GRADING PLOUGHS.
STERLING line of Roller Bearing, Easy Pushing Wheelbarrows and Concrete Carts.
WHEELBARROWS of every description, both in steel and wood.
TIMBER DOLLIES, TRUCKS of all kinds.

ASK FOR OUR CATALOGUE



SELLING AGENTS:
Alexander Gibb, 13 St. John Street, Montreal.
Bissett & Loucks, Ltd., 151 Notre Ave. E. Winnipeg, Man.
John Burns, 313 Water Street, Vancouver.

HENRY NEW, President. ROBERT W. NEW, Vice-President.

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witlon, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

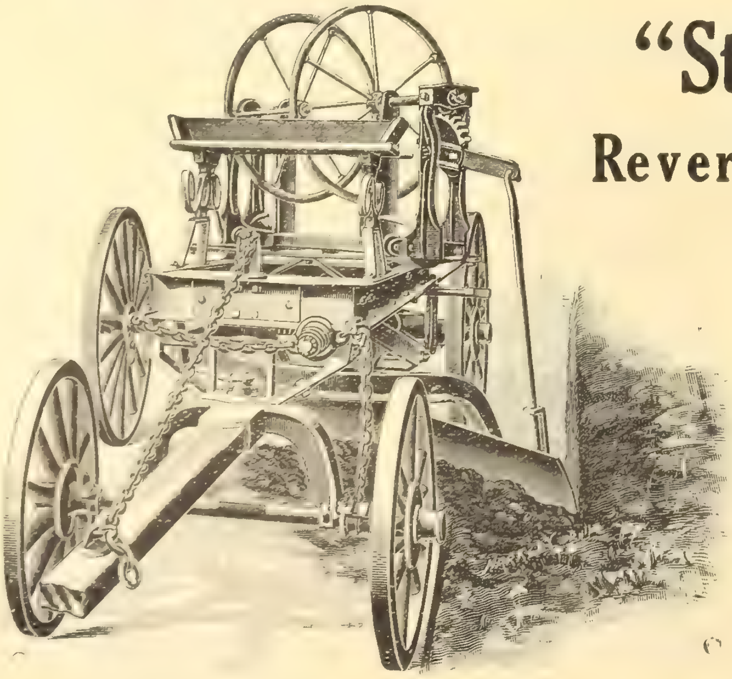
Connection with all railways right from our kilns.

Hamilton Pressed Brick Company, Limited

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY **If You Do Your Road Making With a**



"Steel Champion"

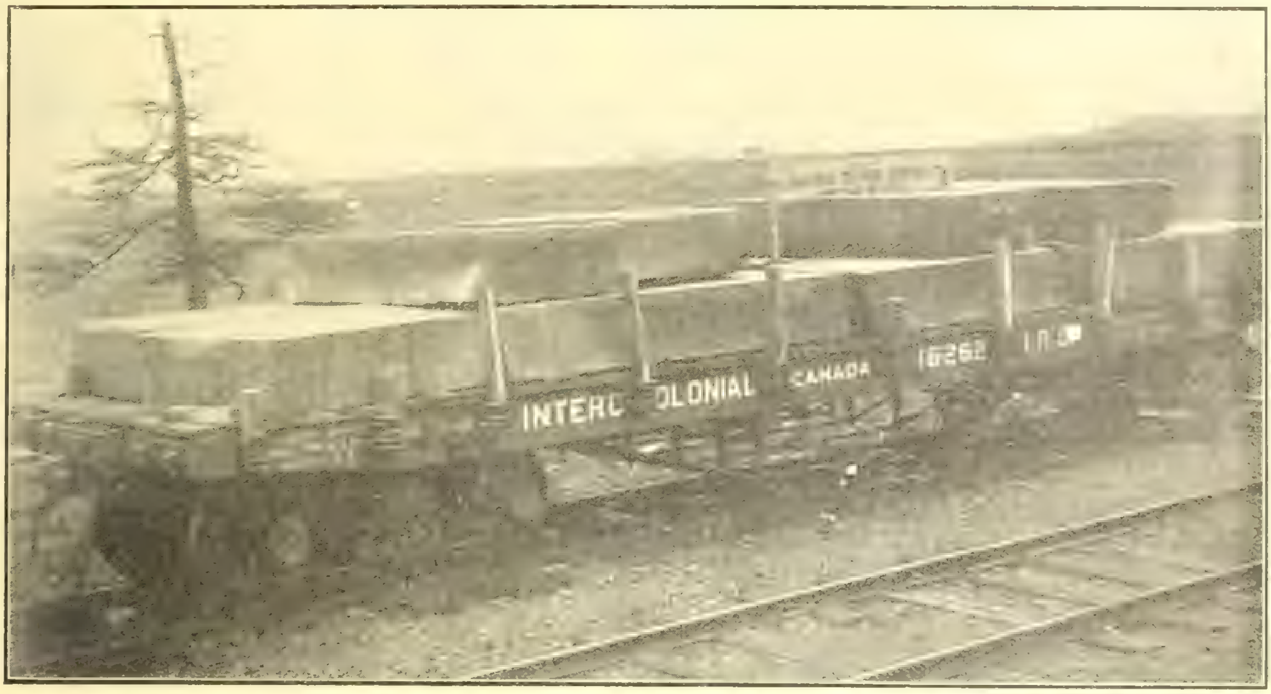
Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

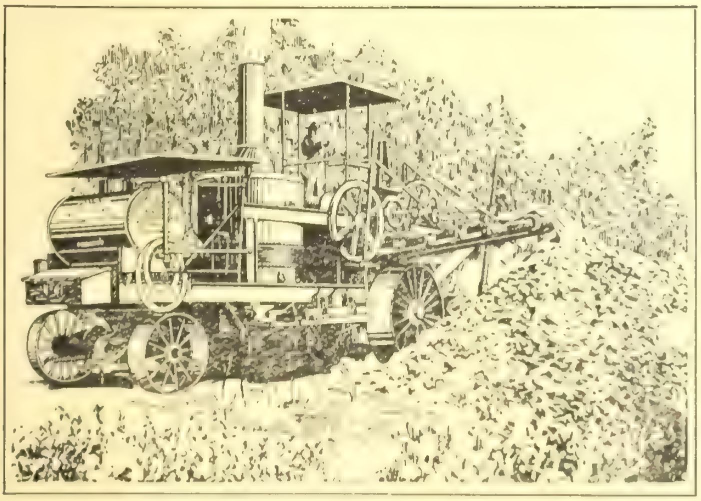


Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

MONTREAL

Chance's Figured Rolled Glass

has a smooth and bright surface for cutting, and a deep, sharply defined pattern which gives it a peculiar brilliancy. It cuts easier and looks better than other makes.

Chances Figured Rolled Pattern G
Registered No. 297,595

Chance's Figured Rolled Glass is made in white, blue, green, wine and amber, and in a great variety of patterns. "Pattern G," illustrated here, is a favorite with many architects.

To Architects, Builders and Contractors we will be glad to send, on request, samples, in a variety of tints, of Figured Rolled, Double Rolled Cathedral, Muffled and the new Flemish Glass, manufactured by Chance Bros. & Co., Limited, at their famous glass works near Birmingham, England.

Among the samples you will find glass suited for your very best work, and moderate in price. Write for them now.

Agents for Canada

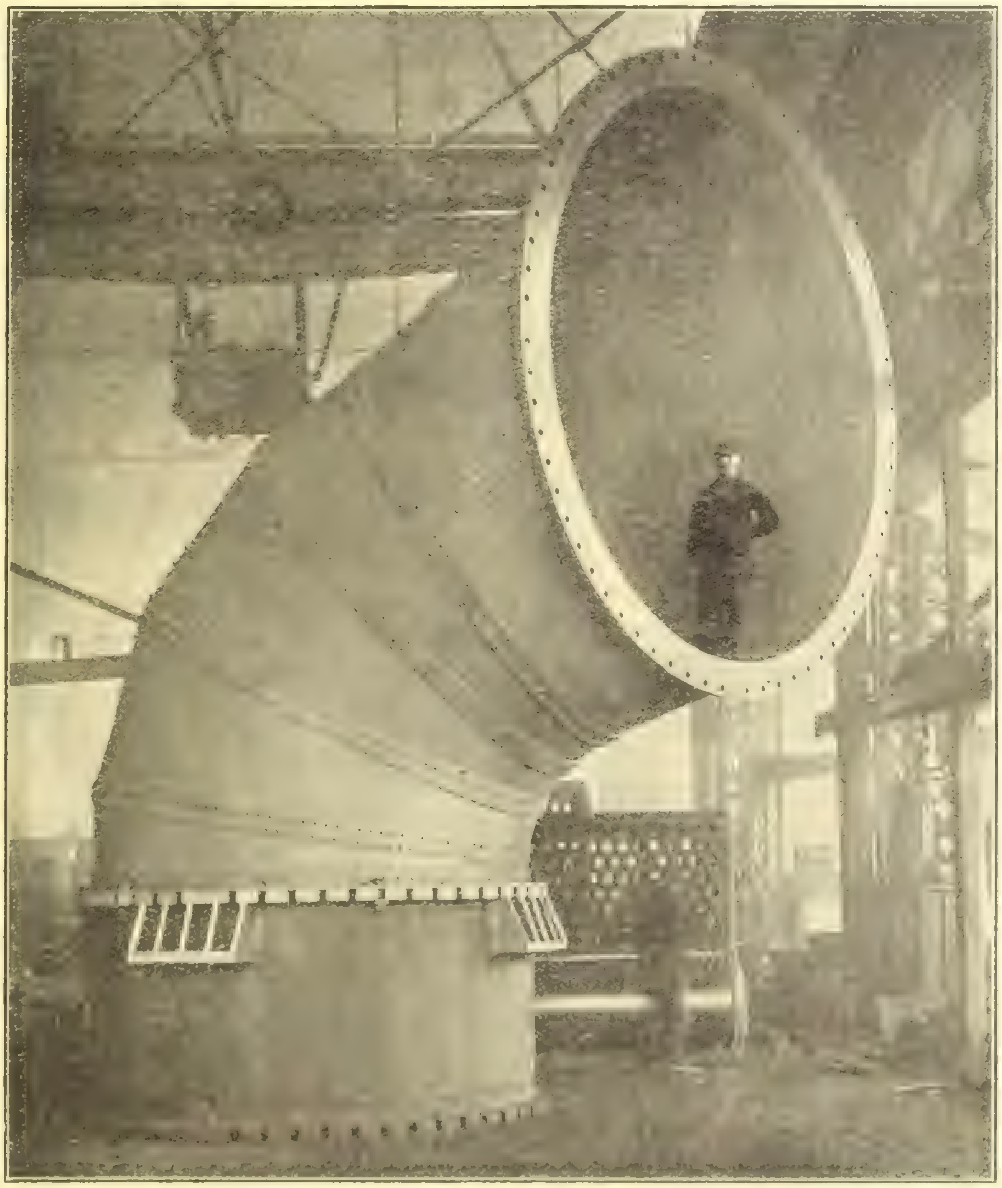
B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Rivetted Steel Pipe

Penstocks - Draft Tubes

and all classes of Rivetted Steel



Section of Draft Tube manufactured for Electrical Developement Company, Niagara Falls, Ont., by

Canada Foundry Company

Head Office and Works: - - TORONTO Limited

Montreal Ottawa Cobalt Halifax Winnipeg Rossland Calgary Vancouver Prince Rupert

Do You Want Sewer Pipe

PRICES ALWAYS RIGHT

Before Winter Sets In?

We still have a large and

Complete Stock

with which to

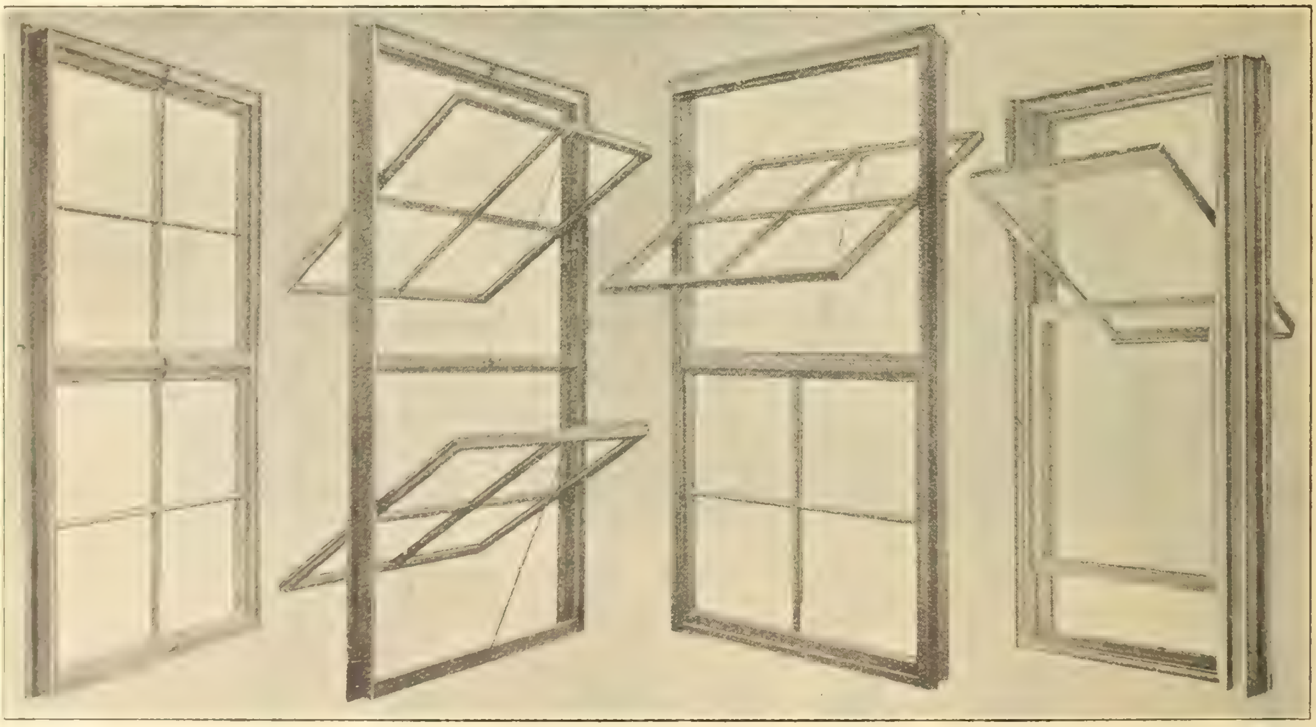
Fill Orders Promptly

and

we will pay for your telegrams if

you are in a hurry

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones:—Toronto Connection, Park 422—Evenings, Park 3888 and 3889



Pivoted Frame Closed — Pivoted Frame — Double Hung

Our Fireproof Windows have Stood the Test

DOUGLAS BROS., Limited TORONTO, ONT.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

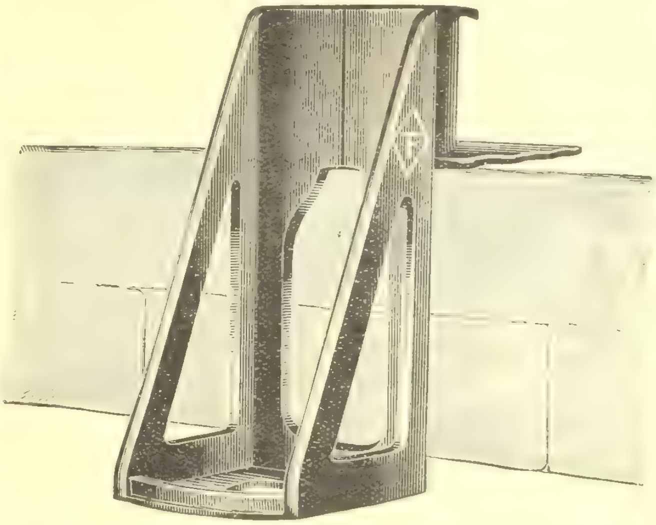
HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

SATINETTE

When an Architect specifies Satinette he desires to enhance and protect the beauty of his design

When a Contractor recommends Satinette he shows his good taste

"Satinette"—the enamel that never turns yellow—is the most perfect and durable white enamel ever made.

"Satinette"—is suited for decorative work of every description—Gloss Interior and Flat Interior for interior work and Gloss Exterior for all exterior work.

"Satinette" is always in evidence where elegance is of primary importance.

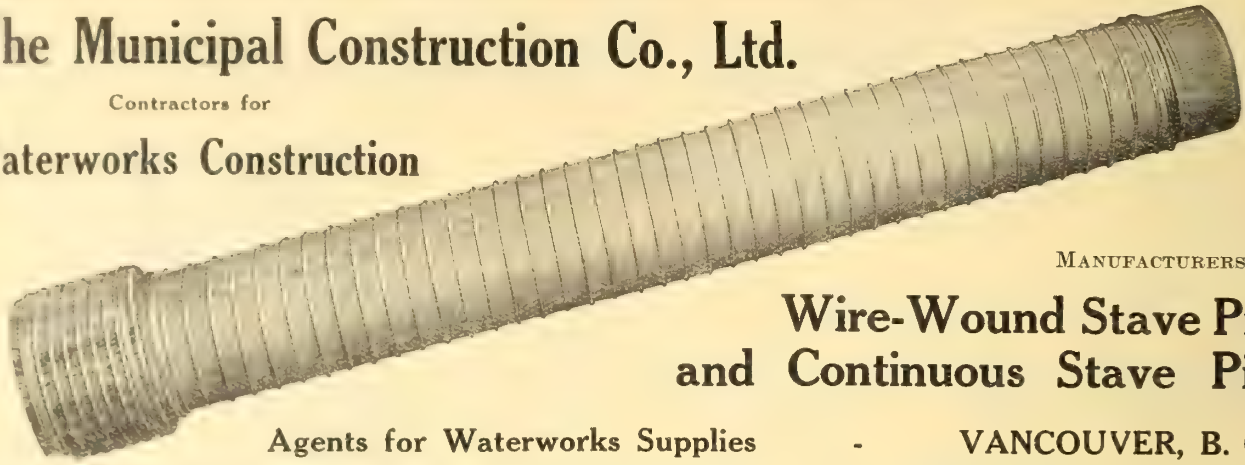
"Satinette" makes an artistic, durable and Sanitary covering for house decoration.

Like all Standard Products "Satinette" is the result of **much thought** and **experience and is now the most popular enamel finish** on the market.

All Standard Products are sold in full Imperial Measure Cans and manufactured by

International Varnish Co., Limited

TORONTO WINNIPEG



The Municipal Construction Co., Ltd.

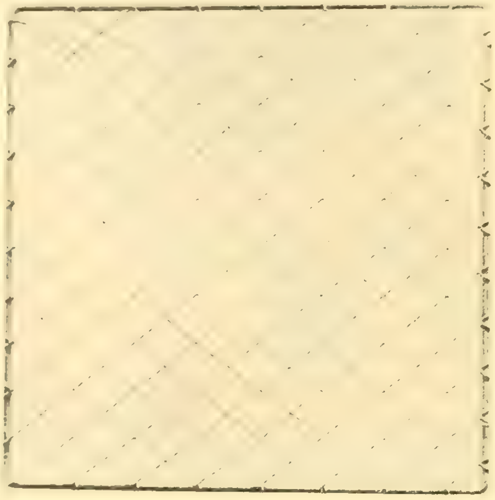
Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

Our Specialties
Special Mantels
Staircases
Panelling
Bank Fittings
Office Fittings
Glass Partitions
High Class Doors
House Fittings

Phone Main 3166 After Business Hours College 1097

Lickleys Limited

MAIL BUILDING

TORONTO

Estimates Given.
We supply Contractors with high class Interior Fittings of all kinds.

Enquiries for Ontario and East should be addressed to
LICKLEYS Limited,
Mail Bldg., Toronto

For Winnipeg and District,
J. MALCOLM SUTTIE,
Travellers Bldg.
Winnipeg

For British Columbia,
E. V. ALBURTY & CO.,
Dominion Trust
Bldg., Vancouver

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED

All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

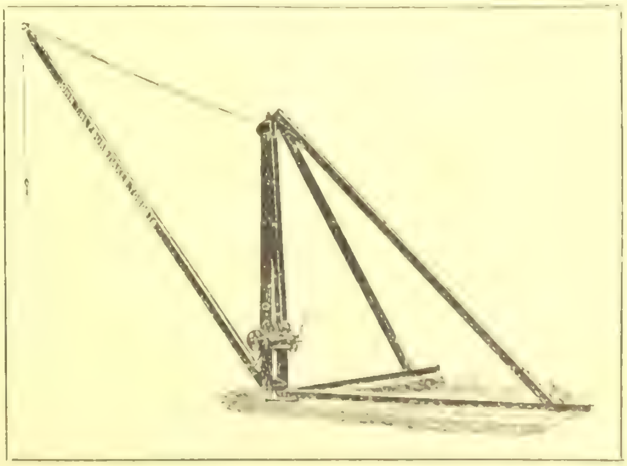
Wire Rope any size for all purposes

Every "Hepburn" Derrick, when it leaves our works, is equipped with an ample length of first quality wire rope.

But one Derrick will outlive many a rope. Our Wire Rope is

Strong, Flexible
and
Thoroughly Tested

When your old rope is worn, when you need wire rope of any size, in any quantity or for any purpose, you cannot do better than send direct to us for it.



Let us send you Quotations

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Everything for the Builder

Sand and Gravel Screened, Pit Run and Pea Gravel Building Sand

We can also ship promptly, Building and Crushed Stone, Lime, Cement, Fire Clay, Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile.

LET US FIGURE WITH YOU.

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North 664, 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

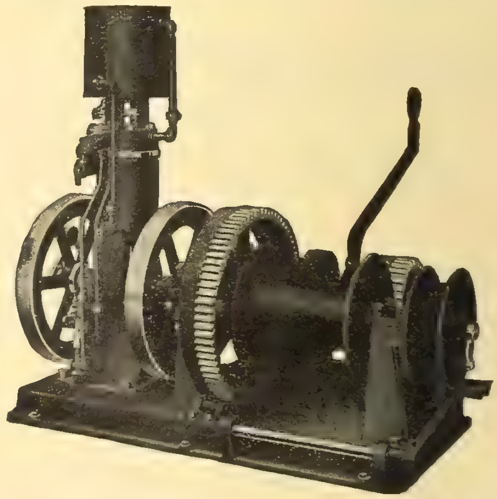
Stinson-Reeb Builders' Supply Co.
Limited

9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material.

Climax Hoisting Engine

for running two platform Material Elevators



Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company

Hamilton, - - Ont.

Chestnut House Trim

Our Specialty

also Pine and Hardwood

Our work gives satisfaction

The Tillson Co., Limited

Tillsonburg, Ont.

The

Willson Portable Flare Light

Good contractors know that it always pays to get the best appliances.
The Willison Portable Flare Light, which is specially adapted for use in all kinds of construction work, cannot be beaten in efficiency or cost. Think of it, this light gives a candle power of 8,000 at a cost of less than six cents an hour.

International Marine & Signal Co.
Limited

OTTAWA - CANADA

The Original
MARSH - PAUL AIR VALVE
Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture — also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our
WINDOW GUARDS
Insist on having HARD STEEL WIRE
WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Corinthian Stone
can be supplied in any size, shape or quantity

Corinthian Stone
can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Neptune Meter Co.

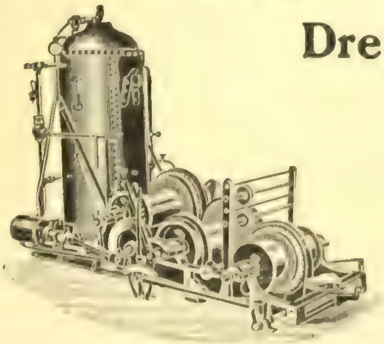
Manufacturers of the well-known

TRIDENT
Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

M. Beatty & Sons, Limited Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superiority** and faithfulness to art in styles they typify.

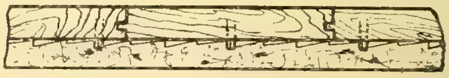
Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

One reason for Herringbone popularity

Because Herringbone is the Self Furring Lath!



SELF-FURRING

The Herringbone ribs project outward.

They sustain the twisted filaments away from the wood backing

They also allow plaster to entirely surround the lath.

Every brand of metal lath used on wood studs should be self furring at the studs.

Other brands adopt special devices so secure self furring.

All Herringbone lath is **always** self furring.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

PRESTON STEEL SIDING

In cases where dryness, durability, and fireproofness are desired for the most reasonable outlay it is a good policy for a contractor to

RECOMMEND

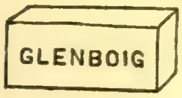
PRESTON Steel Siding. This material is moisture-proof and wind-proof. As it is made and galvanized according to British Government Specifications its durability is assured. While only costing a fraction of the price of stone or brick, PRESTON Steel Siding is equally handsome, as it is made in patterns which duplicate the appearance of stone and brick. Write us for designs and estimates on any work you may have on hand. We will reply promptly and treat you **white.**

Metal Shingle & Siding Co., Ltd.
Preston, Ont.
Branch Office and Factory: MONTREAL, P. Q.

For

Fire and Furnace Purposes

there are no better bricks than



or

Brands

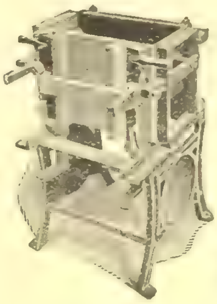
For Building Purposes

where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb, 13 St. John St.
Montreal



"London"
Face-down
Adjustable

Concrete Block Machine

The MOST COMPLETE EQUIPMENT EVER OFFERED IN ANY HIGH-GRADE BLOCK Machine. PRICE ONLY $75.00. WHY PAY AN EXHORBITANT PRICE FOR BLOCK MACHINE making only one width of wall when you can purchase a HIGH-GRADE ADJUSTABLE MACHINE making ALL SIZES AND STYLES of blocks for all widths of walls at a moderate price. OUR MACHINES ARE FULLY COVERED BY PATENTS. WE CAN SAVE YOU MONEY. Write us for full particulars.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Molds, Sill Molds, Ornamental Molds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch :
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world England, Germany, Spain to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

Mixed Cars

We make a specialty of mixed cars of builders' material.

SASH, DOORS (pine or veneered hardwood), **MOULDINGS, CEILINGS, FRAMES, EMPIRE BRAND HARDWOOD FLOORING, STAIRS,** etc.

These materials are strictly high grade and will give a FINISH to house that is sure to please even the most critical.

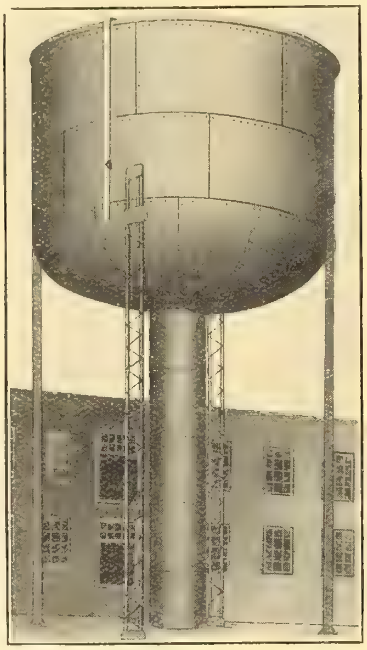
J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent
The Hardwood [illegible] Co., [illegible] St. [illegible] Montreal

Heavy Plate Work

We Manufacture and Erect:

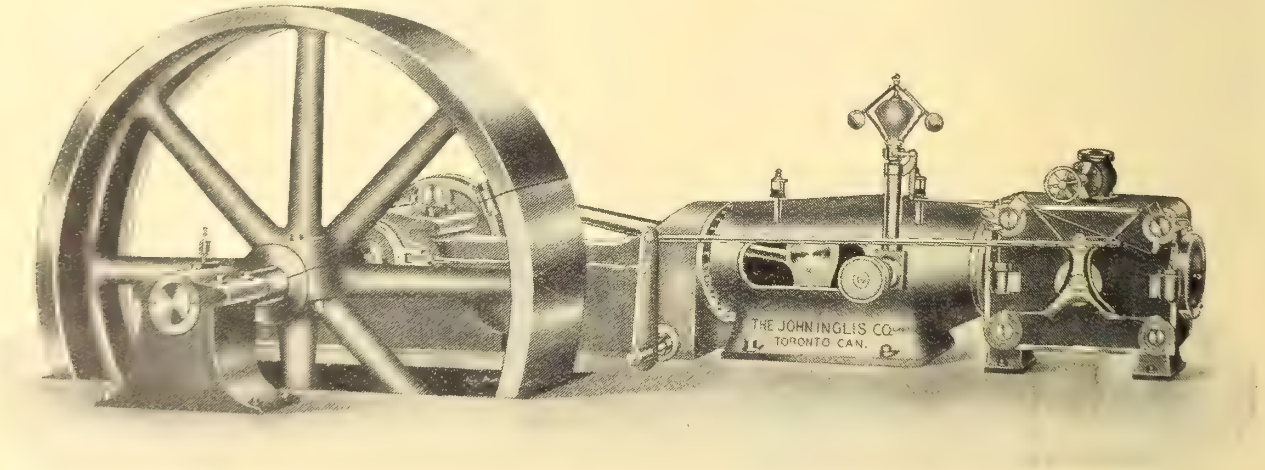
- Stand Pipes
- Penstocks
- Water Tanks
- Dryers
- Fertilizers



100,000 Gallon Water Tank,
built and erected by us for the Michigan Central Railway at Waterford, Ont.

- Blast Furnaces
- Flumes
- Smoke Stacks
- Special Machinery
- Plate Work of all kinds

"INGLIS" Corliss Engines built for a purpose, to last a life time


THE JOHN INGLIS CO.
TORONTO CAN.

Every Engine guaranteed to do just as represented.
Write us for particulars.

The John Inglis Company

Limited

ENGINEERS AND BOILERMAKERS

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Calgary, Alta.

The city engineer has prepared the estimates of the cost of paving Ninth avenue, from Third street west to the river, and also the relative portions of the cost to be borne by the C. P. R. and the city ,if the agreement, as framed, is adhered to. The cost to the city is estimated at $98,770.50, and to the C. P. R., $47,640.35. Total, $146,410.85.

Gleichen, Alta.

The ratepayers will spend $30,000 for waterworks and sewerage. R. B. Owen, provincial engineer, prepared plans.

Hamilton, Ont.

The Works Committee recommended that by-law be submitted to the ratepayers in January next, authorizing the sale of debentures to the amount of $125,000 for laying asphalt on several streets.

Ottawa, Ont.

The controllers recommended that the council next year make provision for the improvement of the street on which the street railway extension into Bayswater will be made. Estimated cost, $10,000.

It is stated that tenders for six destroyers and four cruisers for the Canadian navy will be called for within the next month.

Tenders addressed to A. Johnston, Deputy Minister of Marine and Fisheries, will be received until January 3rd, 1911, for construction of a buoy depot here, including the erection of a reinforced concrete wharf, timber approach trestle, power house with chimney, buoy shed, stores, offices and dwellings, also the installation of drainage and water systems. Plans, etc., at Department of Marine and Fisheries, Ottawa.

Pembroke, Ont.

A by-law will be submitted to provide by way of loan the sum of $65,000 for the extension of the waterworks system here.

Quebec, Que.

Mr. Baillairge, City Engineer, presented a lengthy report of the streets of the city, where improvements will be made during next spring. It was decided to ask the special committee to ask the Legislature to amend the city charter and request leave to borrow half a million dollars for city improvements.

Smith's Falls, Ont.

Notice of a by-law to provide $[illegible] for improvement of the waterworks system was given at the meeting of town council last [illegible]

Souris, Man.

Tenders for delivery during spring and summer of 1911 of water pipes, hydrants, gate valves, valve boxes, pig lead, oakum, standard vitrified sewer pipe, etc., will be received until February 1st, 1911. C. R. Heath, engineer; J. W. Breakey, secretary-treasurer.

Strathcona, Alta.

On Dec. 12th a by-law to provide $70,000 for the purpose of installing sewers in wards one and four, will be voted on.

Toronto, Ont.

Notice is given of the widening of Elizabeth street. W. A. Littlejohn, city clerk.

Construction of the following asphalt pavements has been recommended by City Engineer Rust: Paton road, from Emerson avenue to Lansdowne, $3,189; Edwin avenue, from Ruskin avenue to north end, $11,269; Robinson street, from Palmerston to Euclid avenue, $1,843. Bitulithic pavements are recommended for Bellwoods avenue, from Arthur to Mansfield, to cost $7,161, and for Indian road, from Boustead to Bloor, to cost $8,765.

Victoria, B.C.

The by-law to expropriate the Esquimalt Water Company's works at Coldstream was defeated.

Among the by-laws put through by the city council was that providing for the expropriation of the two lots needed to provide for the extenison of View street from Broad street to Douglas street.. The city contributes only to the work of paving and laying sidewalks. The widening of Douglas street between Humboldt and Superior to 100 feet in conformity with other sections of that artery, was authorized also. The work will be taken in hand at an early date.

Vancouver, B.C.

The civic water committee have decided to submit a money by-law to the electorate in January for $200,000, this amount being recommended by the engineer as needed for the ordinary extension of the distributing system, repairs at Capilano intake, installation of hydrants, etc., during 1911. This by-law does not in any way cover the extension of the waterworks system on the north side of the inlet, on which Engineer Burwell recently submitted a report advising expenditures amounting to $690,000. Noted in last issue.

The joint committees of Vancouver and South Vancouver are stated to have found a basis of agreement by which the two will unite, provided that the terms are accepted by both councils and ratified by the ratepayers. The terms of agreement include an expenditure of $2,000,000 for South Vancouver, of which $1,000,000 is for sewer construction.

Wakely, Sask.

A by-law will be voted on to issue $[illegible]000 5 per cent. road debentures.

AWARDED.

Burnaby, B.C.

The following tenders for laying sidewalks on the following roads were accepted: Messrs. J. H. Harding & J. Harding, North road, Hamilton road, Douglas road from city limits to Lakeview school; Cumberland road, Third avenue and Sixth street, city limits to Edmonds, Royal Oak road, Vancouver road, from Boundary road to [illegible] road, [illegible] road, [illegible] road, Main road, Fourth avenue, Beach road, at $2.64 per chain for four-foot and $1.32 for three-foot walks. Messrs. Cederberg & Campbell: Cameron road, at $1.54 per chain. F. Lugsdin: Edmonds road, Wise road and Vancouver road, from Edmonds to city limits, at $2.47½ per chain for four-foot and 99 cents for three-foot. J. Davis: Keefer road, Smith road and Gray road, at $1.81½ per chain and $2.64 per chain. W. P. Black: Barnet road, at $2.80 per chain.

New Westminster, B.C.

The Hassam Paving Company is stated to have secured the contract for paving Third street for $44,760.

Ottawa, Ont.

The contract for the pump and water system of George L. Orme's residence, near Golf Club, has been awarded to National Equipment Company, Toronto.

Prince Rupert, B.C.

Contracts for grading were awarded as follows: Second avenue, to S. H. Watson & Co., $2,284.16; S. P. McMordie, $969.74; same contractor for section 3, $1,200; for section 4, $3,174.10. To John Viereck, $229.90. P. J. Swanson for work on Beach place, $1,574.32; Hays, Cove and Eighth avenue. McInnes & Kelly, $3,872.14; Reilly & Robarts, $385.84. A. McLean for work on Fraser street, Fifth, Sixth, Seventh and Eighth streets, $286.76. C. W. Tankley, piling, Second street, $197.84.

Quebec, Que.

The following tenders were accepted: Retaining walls, Chas. Cote & Co.; broken stone, J. E. Tanguay; unbroken stone, J. E. Tanguay; Beauport and Chateau Richer stone, J. E. Tanguay; Island ice bridge, E. Verreault, $199; nails, C. A. Parent; carters' numbers, A. Freniere, $400. Mr. Tierney was the only tenderer for sand, but as his tender was considered too high it was decided to call for new tenders.

Vancouver, B.C.

The contract for vitrified sewer pipe was awarded to Colin Jackson, $3,119. Other tenderers were: Evans, Coleman & Co., $3,664, and C. Gardiner, Johnson & Co., $[illegible]

Railroads, Bridges and Wharves

Edmonton, Alta.

The C.N.R. is willing to build a line to Fort McMurray along the general route of the proposed Alberta & Great Waterways Railway if the Government will give [illegible] per mile. The Railway Committee of the Provincial Legislature advanced the bill. Wm. Short, C.N.R. solicitor.

London, Ont.

[illegible]

[illegible] 18-foot bridge, with 4 foot sidewalks [illegible] roadway would cost $50,000. The latter was recommended. A. H. Van[illegible] engineer.

Ottawa, Ont.

The recommendation of City Engineer Ker that W. F. Tye be engaged as consulting engineer in connection with the railway entrances, etc., to the city, was approved by the board of control.

Owen Sound, Ont.

Town Engineer Macdowall in his report to council on the construction of 10th street bridge estimated the cost of bridge, 66 feet wide with 42-foot roadway, for concrete arch, $17,000; steel truss, $19,700.

Oshawa, Ont.

The Canadian Northern Railway gives notice that it will ask for power to construct new branches, from Arnprior to Gananoque, from Pembroke to Cobourg or Port Hope, from Hawkesbury to a point in the county of Leeds or Lanark, and from Parry Sound to North Bay.

Quebec, Que.

Plans for the proposed bridge over the St. Charles were submitted and the committee favored the adoption of the bascule bridge.

Roche Point, B.C.

The Vancouver Dry Dock & Shipbuilding Company will construct a large dry dock here at a cost of $1,214,154. Work to be started within six months and finished by Dec. 1, 1912. L. Thompson, president; F. Bennett, Jr., secretary. G. T. Keefer, resident engineer for the Government.

Victoria, B.C.

Tenders will be called for at once for clearing right of way for the construction of C.N.R. line on Vancouver Island from Alberni here via Sooke. It is stated that the C.P.R. will proceed at once with the Cowichan lake branch for the E. & N. line from Crofton to Cowichan lake.

Vancouver, B.C.

The council approved of the building of a viaduct to connect Georgia and Harris street—the east end of the city with the west—and also a bridge to continue Dunsmuir street so as to intersect the Georgia-Harris street structure. The city engineer was instructed to have plans prepared and estimates made in connection with this bridge and the proposed bridge from Burrard street to Kitsilano over False creek.

AWARDED.

Vancouver, B.C.

The Northern Construction Company of Winnipeg, which recently secured the contract for the first sixty miles of the C.N.R. from Vancouver to Chilliwack, has been awarded the contract for the work as far east as Hope, B.C., a distance of 79 miles from New Westminster. Construction will be prosecuted throughout the winter months. Tenders for the construction of the first section of the island line out from Victoria will be called for at once. Rails for the Fraser Valley section have been ordered from the steel works at Sydney, Cape Breton.

Public Buildings, Churches, Schools, etc.

Alert Bay, B.C.

Tenders addressed to J. D. McLean, secretary, Department of Indian Affairs, Ottawa, will be received until December 30th for the erection of a frame boarding school building at Alert Bay, B.C. Plans, etc., at office of T. F. Neelands, Indian Agency, Vancouver; W. E. Ditchburn, Indian Agency, Victoria; and at W. M. Halliday, local Indian agent.

Chatham, Ont.

Several citizens, comprising among others, Messrs. N. H. Stevens, P. S. Coate, and Rev. A. J. Spence, have a proposition to erect a Chautauqua theatre here.

Calgary, Alta.

Plans, etc., have been prepared by J. H. Garden, superintendent of construction, for the new college here. The building will be of red brick and stone. Noted previously.

The Board of School Trustees have had plans prepared for a 3-storey addition to the high school building on Thirteenth avenue. It will be 50 feet by 70, and extend towards Twelfth avenue from the present building. The building will be of stone. Messrs. Lang & Donler, architects.

The construction of an incinerator is being discussed by the city. Estimated cost, $50,000.

Cranbrook, B.C.

Tenders are called until Nov. 22nd for the erection of city hall. Plans, etc., at office of Thos. M. Roberts, city clerk.

Eli, Man.

Tenders were called until November 26 for school house here. Arthur Tooth, secretary-treasurer.

Fredericton, N.B.

It is probable that an option will be secured on the Terrance property as a site for the proposed fire station.

Fort William, Ont.

C. R. Sayer, travelling secretary for the Y. M. C. A. in Western Canada is here in connection with the proposed building campaign.

Glenbow, Alta.

Tenders were received until Nov. 28th for erection of 1-room school here. Plans, etc., at office of the Western Supply Company, Room 7, Crown Building, Calgary, or at the office of Quinlan-Carter, Ltd., this place. R. P. Blakey, secretary-treasurer.

Hull, Que.

The city will purchase the property of Judge Champagne as a site for the public hospital. The proposition was not submitted by by-law, for approval.

Hamilton, Ont.

The ratepayers will be asked in January to vote $35,000 for a site for the new hospital.

Architects are invited to submit (free of charge) plans and estimates before December 2nd for the House of Refuge, suitable for the county of Wentworth. For further particulars apply to J. W. Jardine, county clerk, Hamilton.

Kamloops, B.C.

The secretary of the Royal Inland Hospital was authorized to write to the Board of Trade to request their co-operation in regard to a new hospital in the city.

London, Ont.

The Methodist Church at Ilderton, near here, was destroyed by fire on the 27th inst. Loss, $6,000.

Merritt, B.C.

The post-office building will be commenced next spring and will, it is stated, cost $10,000.

Montreal, Que.

The members of St. Andrew's Club at a recent meeting subscribed the required amount for the erection of the new club house. The site in view is at the foot of St. Martin street. W. M. Kearns, president. D. A. Bethune, W. S. McNally and J. B. Kinghorn were elected to serve on committees.

A syndicate has purchased the property on St. Catherine between University and McGill street for the purpose, it is stated, of erecting a theatre. Mr. Cecil Short is said to have effected the sale.

An appeal is being made to the citizens and to the people of the province by the committee of Protestant Hospital for Insane for funds to provide a nurses' home and a meeting hall accessible for the patients. Plans and estimates have been prepared and tenders received which show the cost to be $134,000. An offer of half of this amount has been made by a friend on the understanding that the other half is raised by the Protesttant people of the province. Peter Lyall, president; J. C. Holden, 377 Mountain street, honorary treasurer, and Rev. James Barclay, constitute a special committee. Jas. Brown, secretary, 203 St. James street.

New Westminster, B.C.

Tenders will be called for erection of new Y.M.C.A. building on Royal Avenue. Foundations have been laid and plans passed. Mr. E. H. Sands, secretary of committee in charge.

Ottawa, Ont.

The tenders for the erection of the Detention Home were too high, ranging from $1,575 to $2,500. The contract will not be awarded until sufficient funds are guaranteed.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until December 5th for purchase and removal of all buildings between McKenzie avenue and Sussex street. The removal of the above will make way for the new Departmental Block.

A mass meeting of the members of the Masonic Order will be held on December 15th to consider the proposal for a Masonic temple. Tenders will be called this winter and work begun on May 1st. J. A. Ewart, architect.

It is understood that the Government will erect a new quarantine hospital on Grosse Isle during the next session. In a recent official report, Dr. Martineau, medical superintendent of the St. Lawrence river service, writes of the obvious necessity of such changes being made.

Owing to the heavy expense involved the addition proposed for the Parliamentary library will not be built just now, but another storey will be erected over the reading room.

The inner doors of the city hall will be of solid mahogany, and will cost about $425. C. P. Meredith, architect.

The directors of St. Luke's Hospital have decided to add a new wing to the western end of the hospital at a total cost of $80,000. J. R. Booth, president; Jas. Manuel, Sir Louis Davies, Travers Lewis and J. F. Dowling are directors. Horwood, Taylor & Horwood, architects.

Port Arthur, Ont.

The city of Port Arthur has decided to erect a new collegiate institute at a cost of $125,000.

Pincher, Alta.

Tenders are being called by the Department of Militia and Defence for erection of armory here until Nov. 25th. Eug. Fiset, Deputy Minister.

St. Henri, Que.

Tenders are being called by the Public Works Department, until Dec. 6th, for alterations and additions to postoffice building here. R. C. Desrochers, secretary.

Sarnia, Ont.
The Board of Education have made a requisition to the council for the sum of $45,000 for the erection of a new school on the site of the present Lochiel street school.

St. John, N.B.
The residents of Crouchville feel the need of a new school. School Inspector McLean is said to be in favor of it.

Strathcona, Alta.
The ratepayers will vote on a by-law on Dec. 12th in regard to a public library for this city.

St. Thomas, Ont.
Provision is being made in regard to land room for the addition to the Scott street school next year.

The management of Alma College have decided to have a new wing erected, or a separate building at an approximate cost of $30,000. Principal, Mr. Warner.

Toronto, Ont.
The Property Commissioner's recommendation re the site for fire hall in Balmoral avenue was adopted by the property committee.

The congregation of St. Stephen's Church, College street, have announced their intention to erect a new church building and parish house at a cost of $70,000. Rev. J. B. Broughall, assistant rector.

The award for the design for the new Knox College here has been given to Chapmen & McGiffen, of Toronto. Nine plans were submitted for the work. The award includes the commission for designing and superintending the erection of the proposed building. The new building will cost about $400,000 and will harmonize with the general stone design of the University of Toronto.

The management of the Alexandra Industrial School for Girls require about $20,000 for a new building, Miss Parrot, superintendent. The Victoria Industrial school requires two more cottages. Beverly Jones, treasurer; W. J. Hendry, secretary.

Victoria, B.C.
D. C. Frame is the architect for the school to be erected at the corner of Bank street and Leighton road. Preliminary plans have been submitted.

A committee has been formed to obtain competitive plans from the best club architects in Victoria, Vancouver, Tacoma and Seattle for the erection of the new Union Club building (6-storey). Estimated cost, $120,000. F. M. Rattenbury, 606 Fort St., is chairman.

Vancouver, B.C.
The appropriations in the report on schools presented to the council include the building of new schools at Kitsilano (blk. 196), $57,000; Bayswater street, $57,000; Broadway and Lakewood, [illegible]; and extensions to the existing schools at Tenth and Cypress, [illegible]; Charles and Templeton, $81,000; King Edward High School, $150,000; Britannia High School, $145,000.

The school trustees will request the council to authorize the submission of a by-law to raise $967,000 for new schools and improvements; the by-law for construction of city hall will probably be submitted at the same time; also by-law to provide $45,000 for erection of isolation hospital. Noted previously.

The installation of underground sanitary conveniences was brought forward by Dr. Underhill, who presented plans which were satisfactory and which could be erected for about $10,000.

A building permit was granted for construction of theatre block, southwest corner of Westminster avenue and Harris, to the Avenue Theatre Company, $80,000.

Plans for the new labor temple call for a 6-storey building at an estimated cost of $127,000. Noted previously.

Winnipeg, Man.
The Y. M. C. A. building fund reached a total of $354,087, which was more than the amount aimed at.

AWARDED.

Charlottetown, P.E.I.
J. M. Clark, Summerside, has been awarded the contract for erection of Queen's County jail.

Goderich, Ont.
Nagle & Mills, Ingersoll, have been awarded the contract for erection of new postoffice here.

Vancouver, B.C.
The contract for the business block at the corner of Pender and Cambie streets has been awarded to Messrs. McDonald and Wilson, $200,000.

Residences

Hamilton, Ont.
The following building permits have been issued: Nicholson & Beveridge, erection of two frame dwellings on Hillyard street, near Gilkinson street, for L. Mitchell, to cost $4,000; Geo. E. Montrose, erection of a brick dwelling on Undermount avenue, for Miss E. Warwick, $3,800; D. A. Culp, erection of two brick dwellings, Main street, east of Trolley street, for J. Walter Gage, $4,000; Wm. Work, erection of a brick dwelling on Fairleigh avenue, $2,500.

Ottawa, Ont.
The building permits include H. H. H. H. Cowan, dwelling, Armstrong street, $3,000; J. Clothier and Charles Smith, dwelling, Lyon street, $3,000; A. F. Bennett, residence, Florence street, A. Tracy, architect, $3,200.

Victoria, B.C.
Building permit was issued to Herbert Bunting & Son, for a dwelling to be erected on Chamberlain street, to cost $2,500.

Vancouver, B.C.
The following building permits have been issued: Frank Parsons, two storey frame house, 1445 Fourteenth avenue west, $3,800; H. Greenwood, two storey and basement, 863 Fifteenth avenue west, $2,000; J. Skeffington, 1817 Bismarck street, $3,300; R. Reid, 1636 Eleventh avenue west, $3,000; Bentley & Wear, two houses, 2556 Fifth avenue west, $7,600; Currie & Wallace, 2305 Sixth avenue west, $3,500; E. F. Avery, two houses, 1142 Fourteenth avenue east, $4,000; Lambert & Sedney, 122 Hastings street, $6,500; A. Darion, 696 Sixth avenue west, $7,200; I. S. Burton, 1952 Sixth avenue west, two houses, $5,000; P. H. Fraser, 1826 Grant street, $2,700; Prudential Builders, 1965 Fifteenth avenue west, $3,500.

It is stated that the required capital for the large proposed apartment hotel to be erected at corner of Robson and [illegible] streets has been secured. Plans call for 12 storeys, steel throughout, with outside terra cotta dressing. Work will not commence until next year.

Business Buildings and Industrial Plants

Blenheim, Ont.
Mr. Theo. Pickering and Mr. E. G. Thompson are interested in the establishment of a canning factory here.

Charlottetown, P.E.I.
Tenders addressed to C. B. Chappell, architect, will be received until December 6th for remodelling the present London House Building for the Royal Bank of Canada.

Calgary, Alta.
Tenders were received until November 23rd for excavation required in erection of wholesale warehouse for A. McBride & Company. Messrs. Lang & Dowler, architects.

Edmonton, Alta.
The central site for the new railway office building for the C.P.R., it is stated, has been purchased, and plans are being prepared. F. W. Peters, representative for the company.

Fergus, Ont.
Two by-laws will be submitted to the people at the municipal elections, viz.:—$25,000 loan to Beattie Bros., and The People's Railway bonus.

Fort William, Ont.
Wm. Gorman, secretary of the Board of Trade and acting publicity commissioner, has been in correspondence with C. Whitehead, representative of Ely Bros., London, Eng., manufacturers of high grade ammunition, who are favorably considering the location here of their Canadian plant.

Guelph, Ont.
The scheme of Commissioner Carter for a co-operative furniture factory has received the endorsation of the Board of Trade.

Humberstone, Ont.
T. E. Reeb & Sons' foundry and automobile supply was totally destroyed by fire on the 23rd inst. Loss is $15,000.

Kamloops, B.C.
A new exchange will be erected here by the B. C. Telephone Company. Geo. H. Halse, general manager.

Lisgar, Que.
The store owned by Robert Morrow was destroyed by fire on the 25th inst. Loss, about $8,000.

Lindsay, Ont.
After concluding an agreement with the town regarding the erection of a shoe factory and intimating to all interested that the erection would be started at once, the promoter, D. B. Thomas, is stated by press reports to have failed to make his promises good.

Midale, Sask.
The building owned by Wedin Bros., general merchants, was destroyed by fire on the 24th inst.; loss on building, about $7,000; total loss, $30,000.

Nelson, B.C.
A new exchange will be erected by the B. C. Telephone Company here. Geo. H. Halse, general manager. An installation for 1,000 phones or more will be planned for.

Prince Albert, Sask.
Excavations have been made preparatory for construction in the spring of the following: block on First avenue for F. C. McGuire; block on Central avenue for J. H. Mitchell; block on Central avenue for S. McLeod.

Tenders and For Sale Department

Relaying Rails Wanted

[illegible] the market for a carload of relaying rails, 30 pounds to the yard preferred. [illegible] Contracting Company, Limited, Hagersville, Ont. 48

Sealed tenders addressed to the undersigned, and endorsed "Tender for Fittings, Toronto [illegible] Post Office," will be received at this office until 4.00 p.m., on MONDAY, DECEMBER 12, 1910, for the work mentioned.

Plans, specification and form of contract can be seen and forms of tender obtained at this Department and at the office of Mr. Thos. A. Hastings, Clerks of Works, Postal Station "F," Toronto.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, November 18, 1910.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 48

Tenders for
60-inch Steel Pipe

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon of TUESDAY, DECEMBER 13TH, 1910, for the supply of three hundred and three feet of Rivetted Steel Pipe sixty inches in diameter, for the outfall sewer.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Tenderers shall submit with their tender the names of two personal sureties, approved by the City Treasurer, or, in lieu of said personal sureties, the bond of a guarantee company, approved as aforesaid.

Plans and specifications may be seen and forms of tender obtained from the Main Drainage Department, at the office of the City Engineer, Toronto.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman Board of Control.
City Hall, Toronto, November 28th, 1910.

30

Positions Vacant

Advertisement under this heading two cents a word per insertion. Box No. ten cents extra.

WANTED, Architectural Draughtsman; must be experienced. State references and salary. Storey and Van Egmond, Architects, Regina, Sask., Can. 48

Business Buildings and Industrial Plants

Regina, Sask.

Commissioner Sheffield is stated to have received a communication from a concern in Chicago intending to erect a 10-press linseed mill here. The manager of the American Linseed Oil Company, Chicago, Ill., is said to be the prospective manager.

South Vancouver, B.C.

A Chinese syndicate headed by Sam Kee will erect a large block at the corner of Ferris road and Main street.

Ottawa, Ont.

Mr. G. A. Troutt, of the Vandyke Motor Company, Detroit, has shipped one of their motor cars here. When it arrives he will come to Ottawa in connection with negotiating for an automobile manufacturing industry here.

The Union Bank, it is reported, has secured an option on the southeast corner of Little Sussex and Rideau street.

Sherbrooke, Que.

It is understood that the E. & T. Fairbanks Company here will call for tenders for extension of their plant.

St. John, N.B.

The cooper works of Taylor & White were damaged by fire on the 19th inst. to the extent of about $5,000.

The specifications for the Atlantic Sugar Company's proposed refinery prepared by the Geo. M. Newell Engineering Company, Philadelphia, have been filed. They call for brick and reinforced concrete. Tenders will be called soon, it is stated.

South Vancouver, B.C.

Work has been started on the site for the structure which the People's Trust Company are erecting on the corner of Fraser avenue and Miles road.

Sydney, N.S.

Mr. Walters, confectioner, is having plans prepared for a large business building to be erected on the property on Charlotte street recently purchased by him. Work will start in the spring.

J. J. Turnbull, druggist, has purchased the Peters building on Charlotte street. Plans are being prepared for the erection of a modern business building to replace the present one in the spring. The new block will probably be built of reinforced concrete and Sydney pressed brick.

Toronto, Ont.

The G. T. R. are removing their South Parkdale station. Plans are being prepared for the erection of a large new station to be erected near the junction of King and Queen streets at Sunnyside.

It is reported that the C. P. R. will erect on their recently acquired property, King and Simcoe, a large office building, as well as the ticket office proposed for corner of King and Yonge streets.

Vancouver, B.C.

Plans have been prepared by Parr & Fee, Granville street, for the erection of a large block on Granville street. The foundations are being dug.

A building permit has been issued to Messrs. Donnellan & Donnellan, architects, for a building to cost $650,000.

The corner of Dunsmuir and Seymour streets has been purchased by Mr. Arnold, whose intention, it is stated, is to erect an 8-storey business building. The sale was effected by the British Canadian Securities Company.

It is understood that L. P. Strong, of Calgary, of the Alberta Pacific Elevator Company, is completing arrangements for the erection of a large elevator on Burrard Inlet, work on which will be started next year.

A company recently incorporated as the Canadian Electric Manufacturing Company (capital,, $150,000), it is stated, will erect a factory here to manufacture electric water heaters. J. J. Von Dohlen, of this city, is interested. E. W. MacLean, Vancouver, president.

The management of the British Columbia Electric Railway Company has prepared plans for the utilization of the balance of the block on which its Mt. Pleasant car barns are located, and the improvements will be made in the near future. The present plans contemplate the erection of a large paint shop at Fourteenth avenue and Main street, and the arrangement of the plat between this building and the car barns for storage tracks. Tenders have been called for the work.

Wingham, Ont.

The G.T.R. freight sheds were destroyed by fire on the 22nd inst. Total loss, about $12,000.

Winnipeg, Man.

The wholesale warehouse and offices of Martin, Bole & Wynne Drug Company were destroyed by fire on the 22nd. The building was owned by Geo. F. Davies, of Honolulu. Loss on building, $50,000.

AWARDED.

Calgary, Alta.

Messrs. J. A. McKenzie and J. C. McNeill are in charge of the construction of the 6-storey business block on Eighth avenue. Building will start early in the spring.

New Westminster, B.C.

The contract for construction of B. C. E. R. depot here has been awarded to Broley & Martin, of this city, $80,000.

Mr. W. H. Cawston, superintendent of buildings, is in charge of the erection of new Bank of Commerce building, corner of Columbia and Sixth streets.

Ottawa, Ont.

The contract for the masonry, brick and concrete work of the Blackburn Building has been awarded to Holbrook and Sutherland. It is stated that the contract will reach $30,000. W. E. Noffke is architect.

The contracts awarded this week in the building being erected for Barrett Brothers are: Dominion Bridge, brick work; McArthur Brothers, brick work; J. W. A. Kirk, cut stone; W. and N. Floyd, masonry; S. N. Morley, electrical work. W. E. Noffke, architect.

W. J. Carson has been awarded the contract for the plate glass, in connection with the 12 new stores on the corner of

Bank and Sparks street. C. P. Meredith, architect.

Vancouver, B.C.

A contract for the construction of the Robson street annex of the Hotel Vancouver has been awarded to Messrs. J. L. Skene and J. S. Christie by Mr. R. Marpole, general executive assistant of the Canadian Pacific Railway. Work on the erection of the main wing of the proposed main hotel building will be started later on. Honeyman & Curtis, architects.

The building contract for a business and apartment block at the corner of Seymour and Smith street has been awarded to E. J. Ryan. Total cost of building, $100,000. Parr & Fee, architects.

Waterdown, Ont.

Chambers & Simpson, 103 Bay street, Toronto, have been awarded the contract for roof and roofing of Dominion Sewer Pipe Company's new plant here.

Winnipeg, Man.

Messrs. C. Simpson & Company are the contractors in charge of the erection of the carbon factory for the Canadian Carbon Company of Winnipeg, which is estimated to cost about $15,000. E. W. Hanna, Winnipeg, president; A. Landeau, Toronto, Ont., vice-president.

Power Plants, Electricity and Telephones

Coquitlam, B.C.

The ratepayers carried the by-law granting a franchise to the Western Canada Power Company to run power lines through this municipality.

Calgary, Alta.

A further extension of the natural gas business here is planned. The following were elected directors of the company: Senator J. Lougheed, L. K. Kerr and A. E. Cross.

Guelph, Ont.

A $30,000 Radial Railway by-law is being considered by the council.

The route previously surveyed by the People's Railway Company in 1906, or the route to Hespeler, etc., has been gone over and engineers will proceed to lay out the land shortly. Mr. Hackney, manager Radial Railway Company.

Kingston, Ont.

The light, heat and power and the fire and light committees have recommended a by-law to be submitted to the ratepayers to expend $13,000 in improving the street lighting system.

London, Ont.

The ratepayers may be asked to adopt a policy of electrical radial railway development. Two proposals are before the council. The promoters of the London & Northwestern Railway ask the city to guarantee their bonds to the extent of $150,000 as an aid to the construction of a road from Sarnia to London, via Forest and Arkona. The promoters of the North Midland Company ask for aid on a similar plan to the extent of $200,000 for a road from Stratford into London, via Lucan and St. Marys. A third line is talked of from Ingersoll to London, but so far no application in its behalf has been made.

Montreal, Que.

The report of the Public Utilities Commission orders air brakes, wheel guards, and the abolition of all the single truck cars.

North Vancouver, B.C.

The B. C. Telephone Company have been refused permission to lay the submarine cable across the inlet. The cable will have to be taken across either at the First or Second Narrows.

New Westminster, B.C.

The Western Canada Power Company is going ahead with the erection of the steel towers to convey the power from Stave lake to this district. A gang of men is engaged on the concrete foundations between Port Haney and Stave lake.

Nelson, B.C.

Among the extensions planned by the B. C. Telephone Company is the line along the north shore of Kootenay lake across from here to Balfour; also another from here to Slocan Junction, then on to Slocan, a distance of 32 miles.

Ottawa, Ont.

The merchants along Sparks street have agreed to pay for the installation of cluster tungsten lamps every 100 feet; the Ottawa Electric Company will supply light at a moderate figure for a term of ten years. The matter was referred to council.

Rouleau, Sask.

It is proposed to construct an electric light plant, to cost about $60,000. Contract will be let next year. Engineer, J. D. Whitmore, of Regina. W. H. Stewart, city secretary-treasurer.

Regina, Sask.

The report of Engineer Bull in regard to the new power plant and equipment which he reports as necessary, contains the following recommendations for supply of material: One 1,500 k.w. 1875 k.v.a. turbine generator unit, 2200 volt, 60 cycle, three-phase, with direct connected exciter, f.o.b. Regina, $42,000; foundation for unit and condenser, $1,200; installation of exhaust piping and valves, $1,000; surface condenser, $5,000 square feet, with engine and circulating air pumps, f.o.b. Regina, $9,595. Total cost for installing the alternating current generator will be $53,395. City Solicitor Grooch was instructed to prepare a by-law to raise the sum necessary for improvement required, $134,094.

Sherbrooke, Que.

It is stated that the report of the engineers, Messrs. Ross & Holgate, on the development of the drop-off power on Magog river will develop from 2,500 to 3,000 h.p., about the same as the present city power. Estimated cost, about $70,000. The Board of Control, to whom the report has been submitted, will recommend that tenders be called for the development.

Toronto, Ont.

Mr. E. M. Ashworth, of the Electrical Department, submitted the following system of lighting to the Board of Control: (a) For residential streets, 100 watt tungsten lamps, 80 c.p. each, mounted on concrete poles, 100 feet apart, on both sides of the street. Cost, $9 per year each, or 2.466 cents per night. (b) Main business street, ornamental cast iron pillars, each carrying five 80 c.p. tungsten lamps. Pillars to be placed 80 feet apart and to be fed by underground cable. Cost, $52.50 per year, or 14.39 cents per night. (c) Business streets and important intersections not in the underground district, for locations where the single lamps do not give sufficient illumination, clusters consisting of two, three or four lanterns, placed around the concrete posts, will be provided. No statement of cost. The prices quoted include capital charges, cost of renewals, inspection, and cleaning, and cost of current. The present price of arc lamps is 19 cents per night, or $69.35 per year; that of gas lamps, $20 per year.

Vancouver, B.C.

Tenders were received until Nov. 22nd for tunnel excavation about 600 feet by W. H. Hazlitt, purchasing agent, B. C. E. R. Co., Ltd.

AWARDED.

Calgary, Alta.

The tender for supply of about 1,045 tons of steel rails was divided between J. W. Campbell, of this city, and Gorman, Clancy & Grindley, both representing American firms. Total price, $105,000; that for A.S.C.E. rail used in suburban lines, $52.14 for No. 1 grade; for No. 1, Lorraine, $56.54.

New Westminster, B.C.

See "Business Buildings Awarded."

St. Thomas, Ont.

The committee have awarded contracts as follows: Westinghouse, Hamilton, 1,000 tungsten lamps, at $1.25 each, f.o.b. St. Thomas; the other tenders were: Ingram & Davey, $1.28, f.o.b. St. Thomas; Dawson & Company, Montreal, $4.28 f.o.b. Hamilton; Canadian General Electric, $1.40 f.o.b. Toronto; Sanram & Roberts, $1.28 f.o.b. St. Thomas. The tenders of Packard & Company, St. Catharines, for light meters was accepted. St. Thomas gets a ten per cent. discount by combining its order with that of Galt. The Ferranti Company of Birmingham, England, will supply polyphase or power meters.

Miscellaneous

Fort William, Ont.

The probable list of by-laws and approximate amounts for which the people will be asked to vote will be about as follows: Parks, $12,000; additions to board of works site $8,000; publicity, $10,000; water, $60,000; electric lighting, $20,000; telephone, $25,000; quarry (doubtful), $25,000. Total, $152,000.

Hull, Que.

The city council has authorized the purchase of a steam crane for the pump house, to cost about $1,000.

Ottawa, Ont.

Tenders are being called by Public Works Department until December 9th for construction of two 180 cubic yard wooden dump scows for dredge "Mud Lark," British Columbia. R. C. Desrochers, secretary.

Stratford, Ont.

The ratepayers will be asked to vote on the following by-laws: [illegible], park improvements; $15,000, market building; $41,610, electric light purposes.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until Dec. 31st for supply of gravel, sand, bricks, asphalt, brass, lumber, etc. Specifications with city engineer.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until Dec. 13th for supply of 303 feet of rivetted steel pipe, 60-inch in diameter, for outfall sewer. Plans, etc., at Main Drainage Dept., office of city engineer.

AWARDED.

Collingwood, Ont.

The contract for the building of the [illegible] steamer for the Toronto, [illegible] St. Catharines [illegible] Company has been awarded to the Collingwood Shipbuilding Company. The [illegible] for delivery of the boat by June 15.

Steam Turbine Pumps

Comparison of Duty, Efficiency and Cost with Reciprocating Pumps —Test and Service Duty—Intermittent Operation

By C. C. Hurd

There has been considerable discussion at various times during the last three or four years in the engineering societies and water works associations as to the possibilities of the steam-turbine centrifugal pump compared with the reciprocating pump or pumping engine for water works use. The same sort of discussion preceded this a few years in reference to the steam-turbine generator, the general use of which in the modern plant is evidence that these units can compete with the reciprocating type of prime mover for power house use.

In considering the economical advantages of the various types of engines or pumps it is necessary to take into account not only the first cost or interest upon invested capital, but the depreciation and maintenance as well as the operating expense; and unless all of these items are considered it is not possible to come to a proper conclusion as to which would be the most economical type.

In the discussion at the meeting of the American Water Works Association three years ago the statement that the centrifugal pump could show an economy, when everything is considered, against the crank and flywheel type was challenged by representatives of some of the large engine builders. It is a noticeable fact, however, that some of these same builders are now offering on the market turbine-driven centrifugal pumps and guaranteeing duties between 95 and 100 million foot-pounds per 1,000 pounds of steam.

One of the features which is often overlooked in the purchase or designing of a pumping plant is the fact that the machinery may or may not be in continuous operation, also that it may not always be operated at its full-load condition. The specifications for large pumping engines almost invariably specify that the duty trial shall be made under full-load, whereas in practical operations, particularly in towns having a direct-pressure system, it is almost impossible to reproduce these test conditions for any considerable period, and it often occurs that the machinery is operated during the greater portion of the time at from one-half to three-fourths of its capacity rating.

It is well known to engineers, superintendents and those familiar with water works service that the total capacity of a pumping equipment must be largely in excess of the average requirements; provision must not only be made for peak loads in times of extraordinary demands, but there must also be spare units to be bought into service at times of repairs, and it is for such service that the turbine centrifugal, on account of its low first cost, makes a very favorable showing in net economy during the annual period.

In comparing these two types of pumps it is necessary not only to consider the cost of the units themselves, but also the cost of foundations, buildings and boiler plant, as it will be readily seen that the total cost of delivering water will include both the fixed charges and operating expense of the entire plant. It is also obvious that a high fixed charge may mean a low cost of operation, or a smaller investment in the pumping equipment, and correspondingly lower duty, a higher boiler-room expense and additional boiler capacity.

In making the comparisons a plant has been selected with an average pumpage of 10,000,000 gallons per 24 hours, which is perhaps slightly larger than the average water works plant in the United States. In designing an equipment to take care of the service for the average city, it would be considered poor judgment to make the pumping capacity less than twice the average consumption. While perhaps it would be better to divide the installation into three or four units, particularly if the plant is to operate in connection with a direct-pressure system, for the purpose of this paper we assume that the city has a reservoir of such capacity that two 10,000,000-gallon units would be sufficient.

As to the cost of such a plant it is understood that the figures can only be approximate, and that they will vary in both cases according to the conditions and demands. In assuming the operating conditions, we will consider the price of coal at $2.50 per ton, fired into the boilers, and the head pumped against to be 200 feet. The cost of such a pumping plant using vertical, triple-expansion pumping engines, for 20,000,000 total capacity, would be about $180,000. With interest and depreciation at 9 per cent. the fixed charge would amount to $16,200 per year, or $4.33 per 1,000,000 gallons pumped. It would be fair to assume that the centrifugal pumping plant, to do like service, including boilers as above, would cost not more than $90,000, making a fixed charge per 1,000,000 gallons of $2.16.

In the case of the triple-expansion engines under most favorable conditions the station duty would not exceed 150,000,000 foot-pounds per 1,000 pounds of steam. With the centrifugals it would be fair to assume a duty of 80,000,000 foot-pounds per 1,000 pounds of steam, and in both cases that the water evaporated be 6 pounds per pound of coal. One hundred and fifty million foot-pounds duty is equivalent to 13.2 pounds of steam per water horse-power-hour; 80,000,000 pounds duty is equivalent to 24.75 pounds per water horse-power-hour. By using 13.2 pounds per water horse-power-hour and a total head of 200 feet the steam required is 11,232 per 1,000,000 gallons pumped, and with 6 pounds evaporation 1,872 pounds of coal will be used, which at $2.50 a ton would mean that the cost of fuel is $2.34 per 1,000,000 gallons pumped. Also, for the equipment using 24.75 pounds per water horse-power-hour 20,800 pounds of steam are required per 1,000,000 gallons pumped, with the same evaporation, 3,460 pounds of coal would be used at a cost of $4.33 per 1,000,000 gallons.

Assuming labor, depreciation and maintenance to be the same in both cases, this gives a difference of $8,100 per year in the fixed charges in favor of the centrifugal plant, and approximately $7,300 per year difference in operation in favor of triple-expansion installation, or a net balance of about $800 per year in favor of the less expensive plant. With an average pumpage of 10,000,-gallons per day this would represent a saving of 21 cents per 1,000,000 gallons pumped.

These figures are not intended to be accurate in all the various details, but are fairly approximate for the conditions assumed. The writer, in making estimates on cost of plants of this character, has come to the following conclusions: For large water works plants, where the pump will be in almost constant service, the high-duty pumping engine is the better investment. This is particularly true in districts having a high cost of fuel. On the other hand, for smaller plants and plants where the machinery is liable to be out of service more than half the time and for auxiliary equipment, the turbine-driven centrifugal will show a marked economy over the larger and more expensive unit.

Contractors and Builders Supplies

Crushed Stone

For Concrete Fireproof Construction, Roadwork and Sidewalks

Rubble, Portland Cement

CRUSHED GRANITE for Floors and Sidewalks
SEWER PIPE WEEPING TILE
FIRE BRICK FIRE CLAY

Crescent Fire Brick

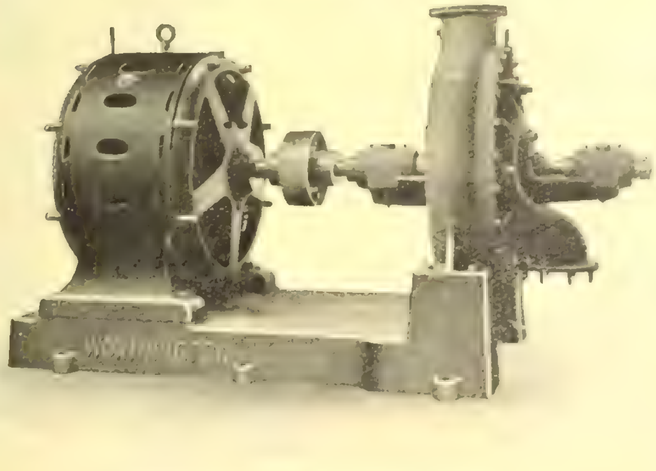
We are exclusive Distributing Agents for this high grade, handmade fire brick. Large stock always on hand.

Don't forget our Prompt Delivery Service.

The Rogers Supply Co. - Toronto

Head Office: 28 King Street West
Phone Main 4155

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

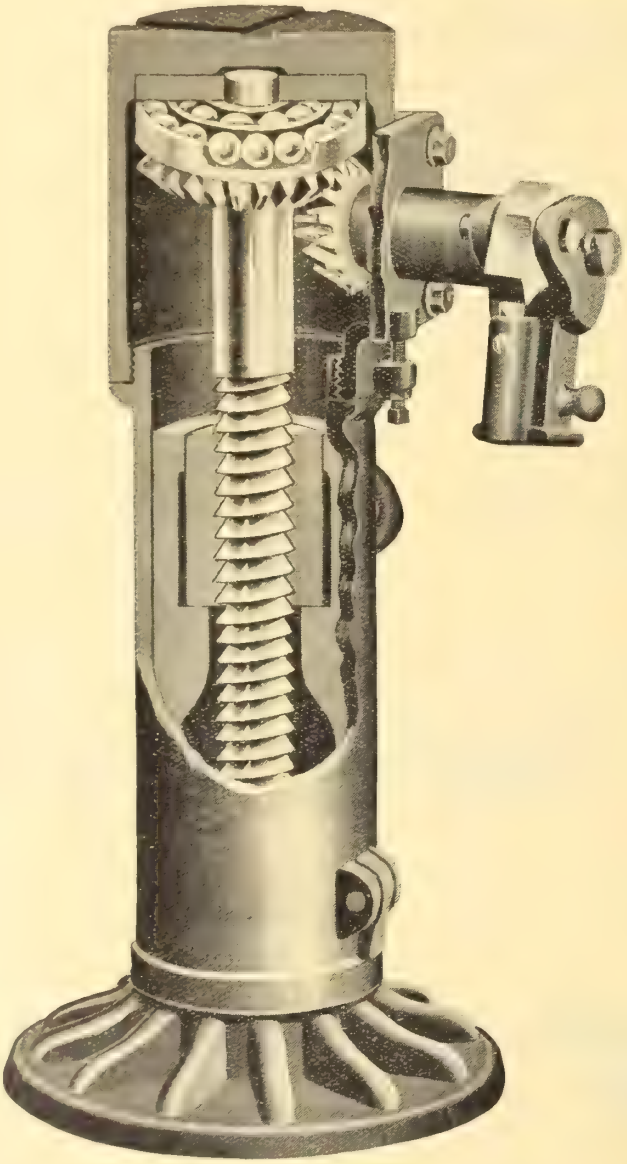
SEND FOR DESCRIPTIVE LITERATURE

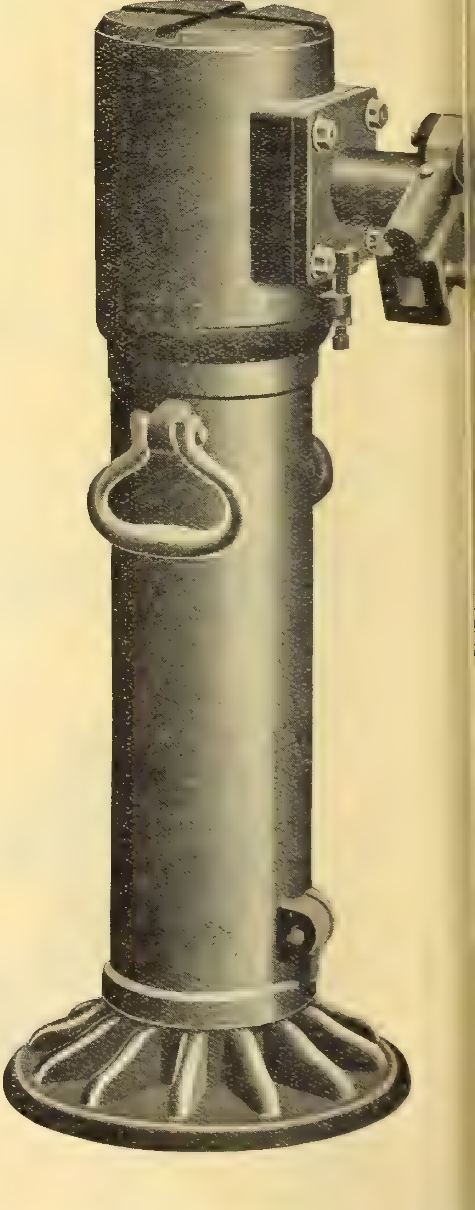
WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
Limited

Norton Jack

The World's Standard





Cone Bearing
Ball Bearing
Ratchet

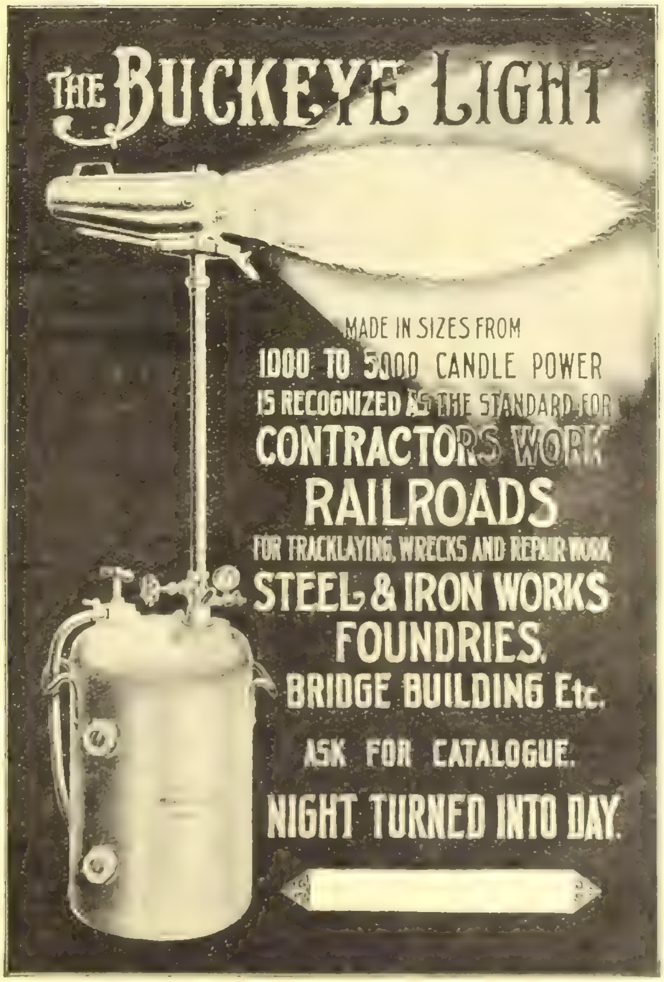
All capacities carried in stock.

Head Offices and Warehouses :
Montreal

MUSSEN

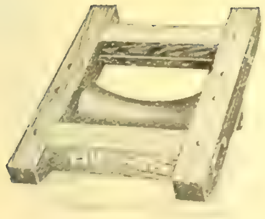
Factory, Warehouse and Railroad

TRUCKS



THE BUCKEYE LIGHT

MADE IN SIZES FROM
1000 TO 5000 CANDLE POWER
IS RECOGNIZED AS THE STANDARD FOR
CONTRACTORS WORK
RAILROADS
FOR TRACKLAYING, WRECKS AND REPAIR WORK
STEEL & IRON WORKS
FOUNDRIES,
BRIDGE BUILDING Etc.
ASK FOR CATALOGUE.
NIGHT TURNED INTO DAY.



Timber Dollies

LIMITED

BRANCHES:
Toronto - 73 Victoria St
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

Glidden Liquid Cement

This material is a very high quality of cement incorporated with or carried in suspension by a waterproofing medium or vehicle of unusual durability and water-resisting features.

You cannot bond plaster to concrete permanently, while LIQUID CEMENT bonds itself very firmly to a concrete surface, producing a most beautiful, decorative effect.

Damp Proof

provides an absolutely damp-proof structure and dries with uniform color. No streaks or spots as is likely to occur with other finishes.

Write for booklet containing Specifications and Description of the many Glidden Concrete Finishes—including the above

The Glidden Varnish Co.

Branches and Warehouses
Atlanta Boston Chicago New York St. Louis

FACTORIES
Cleveland Toronto

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

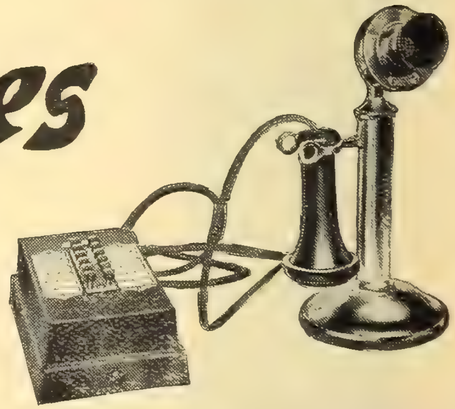
Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

Montreal Toronto Winnipeg Regina Calgary Vancouver



No. 2016 - Type-Metal Inter-phone for desk use

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 November 30, 1910 No. 48

Tenders for Paving Work

A short time ago a Toronto alderman put forward the proposal that the city engineer, before recommending the paving of any street, should call for tenders for the different classes of pavement and circulate petitions concerning the contract prices. It is hardly to be supposed that City Engineer Rust, who was asked to report in this connection, would regard such an innovation with favor. Naturally enough Mr. Rust is opposed to any change in the present system except so far as it might empower him to designate the class of pavement to be laid.

There are many objections to the alderman's scheme. In the first place, as Mr. Rust points out, there is the constant worrying of property owners by agents of the various companies. The educational value to the public of operations of this kind is questionable. Without the technical knowledge that would enable him to discriminate between the claims made by the various representatives, the average citizen is more likely to form a biassed view and to be led to entertain unmerited objections against certain material. Moreover, he is not sufficiently cognisant, in some cases, with local conditions to arrive at anything like the proper solution of the problem.

Another objection to the alderman's suggestion is that after the tenders were put in some time might elapse before the property owners would be prepared to have the pavement laid. During such a period the prices of material and labor might increase and various other unforeseen complications ensue. The contractor in such a casé would certainly not be prepared to undertake the work upon the conditions under which he bid for it, and it is doubtful whether any contract of such a nature would be considered binding upon him. Lastly, it is not likely that many reputable paving concerns would be anxious to figure on different classes of pavement and then have their bids hawked around the city.

In the minds of city aldermen, councillors and such people strange things are originated. This is a fair example.

An Opportunity for the Reader

We will pay ten dollars each, for copies of this paper, that can be shown to be free from errors, either typographically or in statement of supposed facts. The search may cover the entire twenty years of the paper's existence. The proprietors have long cherished the hope that some day a perfectly accurate issue could be brought forth. If there has been such it escaped our attention and we should like to see it.

We will pay double that sum for a similarly perfect copy of any other paper.

Bring on some of your mistakeless paragons who find it so easy to criticise the papers and we will give them the chance of their lives to find out whether they are really human. If there be man-made perfection anywhere, in anything, we want to see it, and will gladly pay the price.—Exchange.

The city council of Victoria, B. C., have finally rejected tenders for the Smith's Hill reservoir and instructed the city engineer to make another examination and report. The bids received ranged from $5,010 (C. G. Betts, Spokane), to $32,500 (S. Rutter, Esquimalt, B. C.). Tenderers submitted their own specifications and none of these were considered satisfactory. In the discussion of the matter before the city council, the Mayor stated that he had a theory that the reservoir had suffered a structural injury, which if located might possibly be repaired for $50. This is a far cry from the $30,000 estimated in the first place by Mr. A. L. Adams. For that matter there is quite a difference between $50 and $15,000, as estimated by Mr. G. H. Bryson, acting city engineer, or $6,000, as figured by City Engineer Smith.

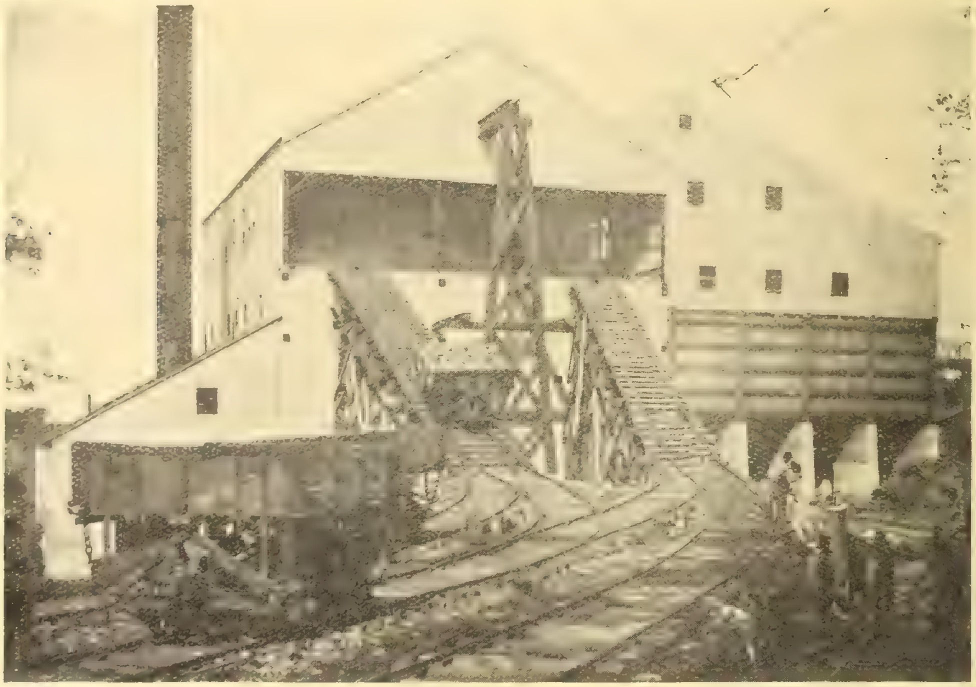
Reckless expenditure of the public's money may be entertained for a time but it's a good thing for those implicated to have an aeroplane ready to escape when sentiment changes.

It is estimated that there are [illegible] new houses now under construction in Vancouver and suburbs.

Great Rock Crushing Plant at Montreal

Built for Messrs Laurin & Leitch—Noteworthy in many Respects: Size, Cost, Operation and Equipment — Detailed Description

By Paul C. Van Zandt



General view showing incline for cars and track arrangement.

The rock crushing plant of Messrs. Laurin & Leitch, engineers and contractors, Montreal, is unusually interesting from its enormous capacity of production and remarkable flexibility of operation.

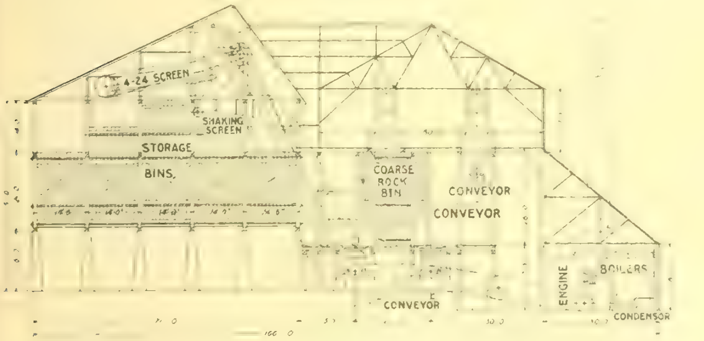
Having obtained from the Montreal Water & Power Company, the contract for constructing within four years a reservoir of 43,000,000 gallons at Outremont, one of the city's suburbs, they recognized the advantage of crushing and marketing the rock at the time the excavation is made instead of piling it on a waste bank, the usual custom in the past.

As the reservoir will be 800 feet long, 400 feet wide and 40 feet deep, formed partly by excavation and partly by enclosing walls, it will be necessary to crush within four years approximately one million tons of hard trap and granite rock, and to provide storage for approximately one hundred and fifty thousand tons in various sizes after crushing so that it can be marketed to the best advantage.

The limited time at the disposal of the contractors and the enormous quantity of stone to be removed within that time necessitated the erection of one of the largest rock crushing plants in the world.

Quarry.—The site of the reservoir from which the rock is quarried is upon the north slope of Mount Royal, and quarry operations have been started at the lowest point in the reservoir site, where an excavation of approximately 20 feet has been commenced. From this point the quarry face will be gradually cut back towards the mountain in parallel with the lower edge of the reservoir. The rock as fast as quarried is loaded direct by steam shovels into six yard side dump quarry cars, which are made up into trains of four each, to be hauled to the crushing plant. The rock is drilled by Temple electric drills, along the quarry face which is 800 feet in length, and after blasting, the cars are brought to the proper location alongside of the steam shovel, close to the bank of blasted rock, by Shay locomotive, which is of the geared type so as to take the grades, pushing the empty cars up to the quarry face, and bringing the loaded cars from the quarry face to the bottom of the incline haulage system leading from the lowest point in the reservoir to the crushing plant.

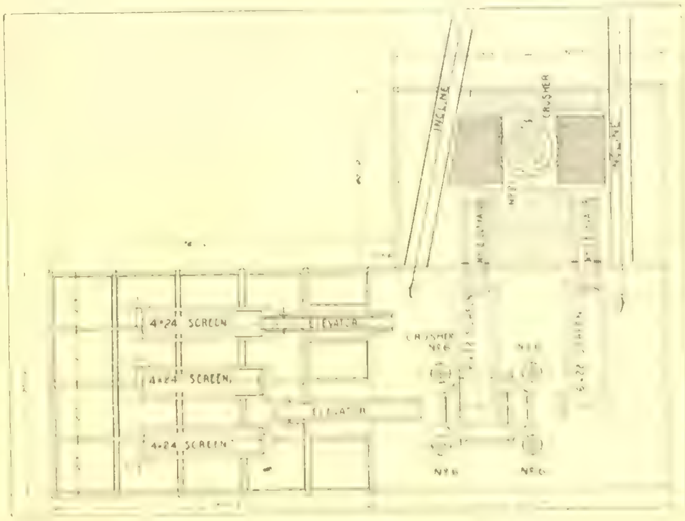
Hoisting System.—The crushing plant is advantageously located upon an excellent site about 1,500 feet from the centre of the reservoir, and to bring the rock from the excavation to the crusher a haulage system has been installed operating in balance, drawing a train of four loaded cars up the haulage incline of about 4 per cent. to the foot of the two incline trestles leading from the ground to the dumping hopper over the large crusher. At the same time, a train of four empty cars is lowered down the haulage incline back to the quarry, balancing in part the up-going load. At the upper end of the haulage incline there is a third track for empty cars, and the trains of loaded cars which are gathered upon first one and then the other of the two outside tracks shown upon the cut accompanying this article, are hauled up these incline trestles of approximately 20 per cent. grade, one at a time and alternately upon each of the two trestles, so that the large crusrer is receiving a carload of rock first upon one side and then upon the other, making its operation almost continuous. The empty cars are dropped to the middle track for assembling into trains for the down-going trip on the haulage incline. All the switches shown are spring switches operating automatically, excepting the one that delivers the empty trains to first one and then the other of the haulage tracks going back to the quarry.



Section of Plant, Showing Conveying, Screening and Storage Equipment

Crushing Plant.—The crushing plant contains five Allis-Chalmers gyratory crushers. One of these is a No. 21, which is the largest gyratory crusher in use at the present time, having a capacity of 1,000 tons per hour. It has two openings 42″ across by 8′ in length, each opening easily capable of receiving a piece of rock 3′ x 5′ x 10′, weighing 10 tons, which is the limit in size of any single piece that can be loaded on a single truck. This crusher, which weighs 225 tons, has crushed a piece of rock this size in forty seconds, down to pieces the size of a man's head and smaller. The primary object of this large crusher and the great advantage in its use are the elimination entirely of hand sledging in the quarry, and almost entirely of the re-drilling and reblasting of large pieces of rock which may have been broken from the ledge in the quarry by a primary blast. Almost everything that comes down after a blast in the quarry can be loaded at once by the steam shovel and sent up to the crusher without further work being done upon same. As hand-sledging, re-drilling and reblasting of pieces once broken from the quarry face, when smaller primary crushers are used, are always the largest item of expense is quarrying, it can readily be seen that the use of so large a crusher effects a great saving, even if we eliminate consideration of its large capacity. This crusher is made with a double discharge, each discharge spout delivering to a No. 18 bucket elevator and each of the two elevators delivering to a 6′ diameter screen having approximately 2¾″ openings. At this point a rough separation of the rock is made and any incidental fines from the first break that pass these openings are delivered to a short belt conveyor, which in turn delivers them to a short elevator and from this to a rotary screen 24′ long over the rock storage bins. These incidental fines in this way bypass the secondary crushers and are delivered to the bins direct ready for shipment. The rejection or oversize from the 6′ diameter screens is delivered to two bins which feed six No. 6 Allis-Chalmers gyratory crushers. One of these bins and four of the crushers are installed at the present time, and a spout is arranged to take the oversize from one of these 6′ diameter screens and deliver it direct to the present bin. The rock in this bin runs out of the four corners into the four No. 6 crushers automatically, and these crushing continuously reduce this over-size rock to marketable size (2½″ and smaller) and all four deliver to a common belt conveyor, from which the recrushed rock is received by a No. 8 elevator, which in turn delivers it to two rotary screens 24′ long, duplicates of the one already mentioned, located alongside of it over the finished rock bins. The smallest product from these three screens consists of rock ¾″ and smaller, which is divided again up three shaking screens into dust, ⅛″ product (which is a fine, clean, sharp sand), ½″ product and ¾″ product. The remaining sections in the 24′ screens separate the crushed rock into 1¼″, 2″ and 2½″ sizes. Each of the above sizes is spouted directly into a compartment in the storage bins, directly beneath the point where it is screened, with the exception of the dust, which is conveyed in a dust-tight screw conveyor to a bin compartment properly covered over. The rock, which is very hard and clean, sizes very accurately, producing the very best of marketable stone.

Storage System.—The storage bins mentioned above have a total capacity of from 2,000 to 3,000 tons, and the bulk of the product is spouted direct from these bins into cars and wagons for shipment. The shipping tracks shown upon the illustration run under three of the compartments, the remaining two being for teams. The spouts and gates from the storage bins are so arranged that any bin may be made to deliver its product to a car or wagon in the compartment on either side as well as the one directly beneath the bin, making it very easy to load more than one size into a car at the same time or to load the same size into two or more cars at the same time. No provision is made for recrushing any of the different sizes of rock, but the excess of any size that does not market as fast as produced is stored up in one of two large piles. The capacity for storage being approximately 150,000 tons, is sufficient to take the entire product of the plant for a period of [illegible] working days. When [illegible] the [illegible] of which [illegible]



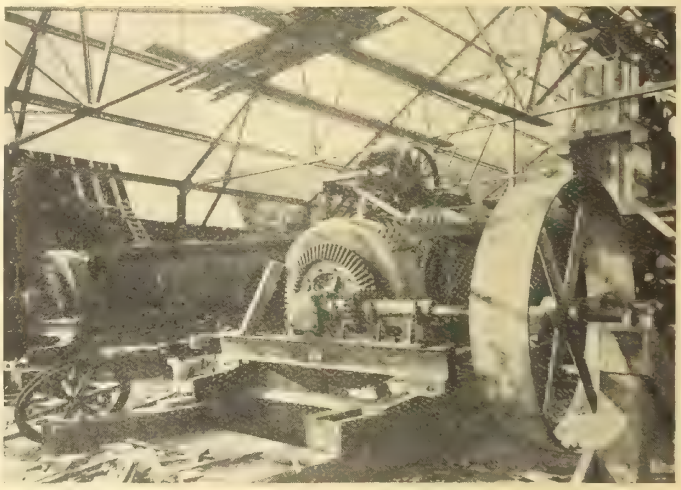
General Plan of Rock Crushing Plant

No. 21 crusher. Hopper openings 12 inches across by 8 ft.long each capable of receiving one stone 3 ft. by 5 ft. by 10 ft., weighing 10 tons.

bin on to a belt conveyor, which carries it out from under the bin to the system of storage conveyors extending over the storage yards. There are two belt conveyors extending under the bin, so that two sizes of rock may be piled at the same time, and the conveying system is so arranged that any size can be piled on any pile. The amount of rock to be stored cannot be predetermined, and it is not the same throughout the year. Moreover, some sizes are marketable only during the summer time, while other sizes are marketable during the entire year, thus making the flexibility of the storage system above described of paramount importance. The conveyors used in this storage system are partly 20″ and partly 24″ belt conveyors of the Stephens Adamson make, and the long storage piles are provided with moveable trippers, which distribute the rock over the pile where desired. On account of the extreme hardness and sharpness of the rock, the belts are made of the best Diamond Rubber Company's brand, with 3-16″ rubber cover for the narrower belts and ½″ rubber cover fo the wider. One specially interesting feature of the conveying system is the distributing centre, where the two belt conveyors leading out from under the bins deliver the material into two small hoppers, where the product from either of these belt conveyors may be delivered to the same piling conveyor, or to any one of the three piling conveyors, without interfering with the other.

Shipping Arrangements.—The rock loaded directly on the cars from the bins is brought out upon the track shown in the illustration, past the scales (which are of the Fairbanks-Morse recording type), printing upon a ticket the gross anl tare, and from this point the railroad track leads to the street railway system of Montreal, upon which it can be distributed to any point in the city, or to any railroad or wharf for further shipment. The wagons leave the property from the other side, passing over another set of scales of similar type.

When the rock that has been piled on one of the storage piles is shipped, it is loaded in a railroad car or wagon placed alongside of the pile by steam operated clam shell derrick crane, made by the Bay City Industrial Works, which has a one-yard clam-shell bucket upon a 40′ boom, so that it can reach from the car to any point upon the storage pile adjacent to it, so that the additional cost of rock taken from the storage pile when delivered upon cars is only a cent or two more than that delivered direct from the bins.



Coarse screens, each 6 ft. by 22 ft., under construction.

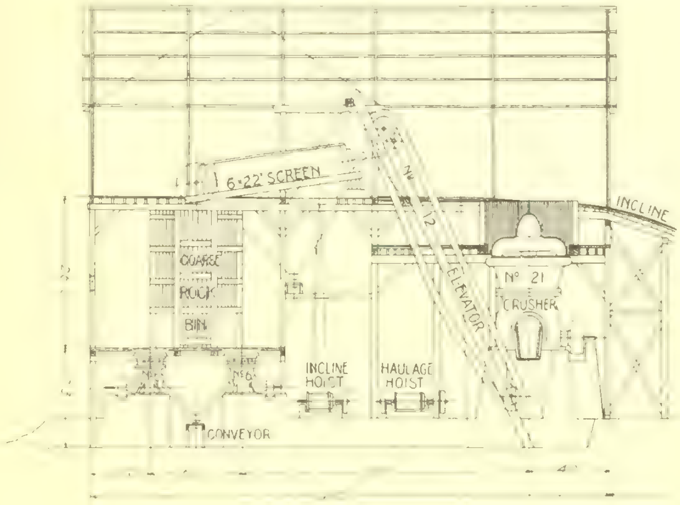
Power Plant.—The power plant consists of two 250 horse power Erie City water tube boilers, and one 720 horse power vertical triple expansion Belliss & Morcom engine, this engine being connected by an English system rope drive to the main line shaft which is in turn belted to the various machines mentioned. The belt conveyors are driven by Allis-Chalmers-Bullock induction motors, and the electric current for these (as well as for the Temple drills in the quarry and for lighting), is supplied by 175 k.w. Allis-Chalmers-Bullock generator. This generator is of the belted type, receiving power from the main line shaft, but is placed in the power house in line with a McEwen automatic high speed self-oiling engine of sufficient power to drive the generator when used either for operating the motors or the drills or the lighting system, when the main engine is shut down. The big engine is run condensing, delivering the steam direct to a Knowles pump and condenser located alongside of it. The hot water from the condenser is elevated by a McDougall centrifugal pump to a water cooling tower just outside the power house. Condensed steam from the auxiliaries is sent through a McDougall water heater and steam pressure upon the boilers is maintained at a constant amount of 160 lbs. by an automatic blast arrangement. The steam plant is one of the most economical that can be installed, the advantage of which is seldom appreciated in a rock crushing plant.

Hoists.—The hoists are of the Allis-Chalmers friction type. There are three hoists, one for the haulage system with a 4′ drum long enough to wind 1,500 feet of rope upon it, which operates the haulage system with two ropes, the down-going cars balancing in part the weight of the up-going loaded cars. The hoist is reversible and operated with a rope speed of 250 feet per minute, bringing a train of cars from the extreme end of the quarry to the plant, in approximately five minutes. The remaining two hoists are for the two incline trestles, hoisting by a friction band and lowering by a band brake. The speel of these hoists is also 250 feet per minute, bringing a car from the foot of the incline trestles to the crusher hopper in about 45 seconds. The three hoists work in unison and are all controllel by one operator located above the crushing floor, at a point where he can see the cars, both at the bottom of the incline and at the dumping point. The speed of the hoisting equipment is such that by the time a train of four empty cars has been lowered to the quarry and four loaded cars have been crushed and returned to the empty track, four additional loaded cars have been brought up from the quarry.

Auxiliary Apparatus.—Over the No. 21 crushers are installed, two Yale & Towne triplex chain blocks, of 20-ton capacity each, for handling any of the heavy parts of the crusher should occasion require to make repairs. The track for these blocks, which are fastened to a trolley or crawl, may be seen upon the illustration, showing how any part may be lifted clear of the building or a new part lifted in. Smaller crawls and chain blocks are provided over the number sixes and elsewhere around the plant. There is a belt conveyor for carrying coal direct from cars to the boiler house. There is a large machine and blacksmith's shop alongside of the plant, provided with a 24″ x 18″ lathe, a planer, radial drill, blacksmith's forge, steam hammer and other proper equipment. This shop is driven by an Allis-Chalmers-Bullock induction motor, so that it may also be operated when the crushing plant is not running, receiving current from the power house.

Reservoir.—The reservoir, which will be the largest in Montreal, was designed by Mr. Frank H. Pitcher, chief engineer of the Montreal Water & Power Company. Approximately one-half of this reservoir is to be completed first and put into operation, while the remaining half is being completed. The main water pipe leading from this reservoir is now being laid by Messrs. Laurin & Leitch, and consists of a line of 60″ cast iron pipe, the laying of which, with its valves, etc., is in itself an item of considerable interest, but which is dwarfed in comparison with the quarrying and crushing operations going on.

General.—This plant is unusual in many respects: primarily, on account of its size and initial cost in proportion to the amount of work to be done under this contract. The size of the plant and the excellence of its equipment are resulting in a saving in the cost of construction of the reservior and the disposal of the rock taken from it which should pay for the entire equipment. It has sufficient capacity to crush the rock as fast as taken from the quarry, so that the product can be marketed immediately after excavation. The rock is handled but once from the excavation to the marketing, and in this way it is immediately disposed of and is out of the way. The rock is excellent in quality and instead of being thrown away on a waste bank, as was the case of the rock taken from the excavation for the Chicago drainage canal, for example, is made to yield a profit. Messrs. Laurin & Leitch use a very great quantity of crushed rock in their own work on other contracts, noticeably street paving, concrete work, and other engineering work of similar character, and a portion of this rock will be used in this way, the cost of which will be less to them than rock purchased upon the open market. The plant, which was designed and equipped by the engineering force of Allis-Chalmers Company, possesses an unusual flexibility of operation in addition to usual economy of production, so that it may be operated to suit both the work of excavation and the market for crushed stone, producing rock for the lowest possible cost of production. The plant is exceedingly compact, resulting in the smallest possible buildings, and is well arranged for operating with the smallest crew of men. One man handles the hoisting and haulage equipment, two men the dumping of cars and feeding of crusher, two men the handling of cars at the foot of the incline trestles, one man for the spring floor, one man for the number sizes, one man for the transmission and hoist floor, one engineer, two boiler men, one oiler and two men upon the conveyors, loading, etc., and these men constitute the entire operating force of the plant. One side of the haulage incline may be operated independently of the other if necessary, as can also one of the incline trestles. One side of the No. 21 crusher with its elevator and screen, can be operated independently of or without the other. Any one or all of the number sixes may be cut out temporarily, and when the balance of the plant is shut down rock may still be loaded or piled on the storage piles, or the drills at the quarry may be operated.



Sectional View of Crushers

Dumping Rock Into Hopper

The annual convention of the Union of Manitoba Municipalities was held at St. Boniface, Man., Nov. 24-25. One of the principal matters discussed at this meeting was the good roads question. Mr. H. McGillivray, Highways Commissioner for Manitoba, read an interesting paper dealing with methods of construction and maintenance, and the manner of distributing cost. A resolution will be forwarded to the Provincial Government suggesting that municipalities receive more substantial assistance in good roads projects.

Pavement Construction and Maintenance

Failure not always attributable to Contractor—Improper Sub-Drainage and Excessive Sprinkling among the various Sources of Trouble—Guarantees*

By George C. Warren

I propose to show that the success or failure of a pavement is fully as likely to depend upon causes beyond the contractor's control, both preliminary to the construction of the pavement and subsequent to its completion, as to perfect or faulty workmanship or materials; although, when a pavement fails to sustain traffic, the public universally, and officials generally, attribute the result to a combination of inefficiency and poor material, for which the contractor is held responsible.

At the outset I believe we shall agree that water is the great enemy of pavements, and the most common cause of their undoing, even when blocks of sandstone or other comparatively soft stone are used. The only material that is not seriously injured by the destructive influence of excessive water is granite, and even that is injuriously affected.

The source of deterioration from water may be summarized as follows: (1) Improper sub-drainage. (2) Excessive sprinkling or flushing. (3) Lack of efficient cleaning. (4) Sub-drainage, due to the absence of pavements, or to their improper construction, between and around railroad tracks. (5) Too flat crown or grade to provide proper surface drainage.

All of these features are absolutely beyond the control of the contractor, yet they provide most fruitful sources of dispute between him and municipalities as to the expiration as well as during the maintenance periods of paving contracts.

Sub-drainage.—Perhaps there is no part of street pavement construction which is given so little intelligent consideration by engineers, or in which local custom is so blindly followed from decade to decade, as this matter of sub-drainage. And yet practically every writer on street pavement construction from John Macadam to the present day has referred to sub-drainage as the first essential to successful road or pavement construction. We find cities where the prevailing subsoil is clay, that affords inadequate natural drainage, providing no artificial drainage for their pavements. We find other cities where the subsoil is either sand or gravel, that affords the best possible natural drainage, providing for their pavements elaborate systems of sub-drainage that are of course wholly unnecessary. Again, we find cities adopting systems of sub-drainage in use in other cities where the subsoil, and, consequently, the artificial drainage requirements, are radically different.

In a certain city which I have had especial opportunity of studying during the past twenty-four years, the pavements have proved to be better than those in any other city I have visited, although the subsoil is generally clay, the poorest medium for natural drainage. Apart from careful construction and selection of material used in the pavement, which have not been greater than the care shown in similar work in other cities, where the results have been far less satisfactory, I attribute the unusual excellence of these pavements chiefly to the elimination of water, both from the under and upper surfaces. This has been accomplished by an efficient system of sub-drainage; and by thorough dry cleaning and entire absence of wetting down the dirt by excessive street sprinkling and flushing.

The system of sub-drainage in this case, which was adopted in the year 1886 and has been strictly adhered to since, is as follows:

(1) A trench 1 ft. wide is excavated under the curb to a depth of 3 ft. below the top, or 18 ins. below the bottom, of the curb.

(2) In the bottom of the trench is placed a narrow culled hemlock board for which other cheap lumber may be substituted, and the pavement side of the trench is boarded up with the same material, up to the bottom of the curb, to prevent the earth under the pavement, as it dries, from falling into the drain.

(3) On the board in the bottom of the trench is placed a line of 3-in. half-round porous tile, open at the bottom and with open joints.

(4) Over the tile the trench is filled to within 2 ins. of the bottom of the curb with hand-placed field or cobble stone, over which is spread a thin course of finely crushed stone, slate shale, or slag—fine enough to fill the chinks in the field stone at the surface, but coarse enough not to run into and fill the spaces between the pieces of field stone.

(5) Over this is spread about an inch of loam or clay (not gravel or sand), which, when dry, will hold together and not sift into the drain.

(6) Over this curb is set in the usual way—if the curb is of stone, it is bedded in either gravel or concrete; and if the curb or gutter is of Portland cement, it is laid directly over the drain. Of course the drains are connected with catch basins.

This method of construction is the best, most efficient, and most economical system of sub-drainage I have ever known. No cross drains have been necessary, although the natural drainage conditions are very poor.

Systems of surface drainage of which I thoroughly disapprove, either because of inefficiency or unnecessary expenses are those that include too shallow drains at the curb; and trenches filled with crushed stone in the centre of the road with similar cross drains at intervals.

The cross drains tend to attract water from outside the roadway and carry it under and to the centre of the pavement, where it percolates into the otherwise dry subsoil. This is not only an unnecessarily expensive system of sub-drainage, but one that is really less efficient than no drainage.

It may be set down as a fact that with any of the modern, nearly waterproof forms of pavement now in vogue, unless there are actual springs under the roadway (an extraordinary condition that requires extraordinary treatment), the subsoil under the pavement will be practically bone-dry if no water is allowed to percolate from back of the curb. To prevent this a drain having a depth of 3 ft. below the curb is all that is necessary. As indicated above, if the subsoil is gravel or sand, providing natural drainage, through which water percolates, no artificial drainage is necessary.

---

*From a paper read before the American Society of Engineering Contractors St. Louis, Mo.

Causes of Failure of Pavements.—The most frequent causes of failure in pavement construction, all of them being entirely under the control of city officials, and just as entirely out of the control of the contractor, are as follows:

(1) Inefficient or no drainage. This was considered above in considerable detail.

(2) Improper back-filling of trenches.

(3) Insufficient crown and gutter grade to carry off water and prevent pools standing near the centre and in the gutters of the roadway.

(4) Lack of cleanliness.

(5) Excessive flushing or sprinkling of streets.

(6) Inadequate pavements, or none at all, between and along railroad tracks.

Watering and Cleaning.—Recognizing that water is the enemy of all pavement surfaces, the effort of those engaged in the improvement of road-surfacing material of every kind is directed toward reducing the porosity of the roadway surfaces, and otherwise protecting them from the ravages of excessive wetting.

On the other hand, the efforts of some street cleaning interests are directed toward keeping the streets wet by various forms of sprinkling and flushing machines, without properly cleaning the surface of the pavements. Still other interests engaged in street cleaning advocate dry cleaning and are developing methods to accomplish their purpose. Their objects are feasible, but, pending the advent of machines that will efficiently and economically do the work, all municipalities should take a middle ground and follow one of the following courses:

(1) Thoroughly wash the pavements nightly without pressure, using either a washing machine or fire hose, and immediately follow the washing with hand squeegees to remove all excess of water from the gutters and slight depressions.

(2) Sweep nightly with machines, lightly sprinkling the pavement in advance of the sweeper, and using enough water to lay the dust but not enough to convert it into mud—exactly as a dirty floor is cleaned by light sprinkling and hand sweeping.

No one would think of wetting a floor to such an extent as to convert the dust into mud, and then expect to remove the mud by sweeping. Yet the equivalent of this is done in most cities where the attempt is made to clean pavements by rotary brooms, immediately following a thorough wetting by sprinkling wagons. After such an operation, is it any wonder that covered with water and earth or sand (a mixture that will sharpen and wear away the hardest steel) pavement surfaces are literally butchered by the grinding they receive from the wheels of the traffic.

Either of these methods specified, if carefully and properly applied, will provide a well-cleaned pavement surface which will require no sprinkling through the day, if hand-cleaned by patrol system by day. The adoption of such a system will insure a pavement that will always be in the best condition for horses, automobiles as well as pedestrians on the sidewalks, being free from dust and mud, and capable of sustaining traffic without deterioration.

Track Construction.—Railroad beds improperly constructed, or tracks poorly laid, are common sources of injury to pavements, and the damage will extend not for only a few feet from the rails, but sometimes across the entire width of road bed. The same undesirable results are often produced by faulty construction in the pavement itself between and along the rails. If the rails or the ties are not securely laid as to prevent vibration, the pavement, whatever may be its construction or the material used, will be sure to break and allow water to work its way through and settle beneath the pavement. I have seen, in a number of cities, first-class pavements laid outside the track area, from the rail to curb, or from within two feet of the rail to the curb, while between and around the rails there would be absolutely no pavement at all. In such cases from 1 to 3 ins. of water will accumulate between the tracks during every heavy rainfall or spring thaw, and have no outlet except into and under the pavement; and if the pavement is not more or less destroyed it is only because Nature has provided conditions which permit the water to drain nearly vertically into and through the soil.

Maintenance Guarantee.—Turning more specifically to the subject of pavement guarantees and maintenance, I am firmly of the opinion that pavement guarantees extending beyond a term of one year, which is ample to test the integrity of material and construction are against the best interests of the taxpayers. In support of this view I offer the following reasons:

(1) Guarantees are always of doubtful legality. On assessment work, which is the basis of payment for over 75 per cent. of the street pavements laid in the United States and Canada, the courts have frequently, if not generally, declared maintenance guarantees to be illegal, because they provide for indirectly assessing abutting taxpayers for the cost of maintenance, which city charters usually say shall be paid for by the city at large.

(2) There is always likely to be more or less dispute between the contractor and the city regarding the contractor's obligations to make certain repairs, especially when the damage done can even remotely be attributed to causes such as those to which we have referred as lying outside the jurisdiction of the contractor, and, similar contentions will arise between the contractor and the city as to the extent of repairs and nicety of condition of maintenance of the pavement which is proper under the guarantee. It is not an exaggeration to say that under guarantees, cities generally endeavor to require contractors to make repairs to pavement surfaces that they would not think of making at the expense of the city.

(3) When guarantees for maintenance are required, prudent, conservative contractors always include in their bids the interest on the cash retained, and the cost of the surety company bond premiums required by the city, and a sufficient amount to cover a conservative estimate of maintenance charges. It has been calculated that if surety company bonds for five years' maintenance were required on all pavements laid in the United States and Canada, the premium, always added to the contractor's bid, would each year amount to more than a million dollars.

(4) Maintenance guarantees tend to produce lax inspection, or the loss of control of construction by the proper city officials, as the contractor in case of dispute or disagreement as to the methods of construction, will notify the city officials, that if he is not permitted to do the work in the way he thinks best he will not be responsible for the guarantee.

(5) Maintenance guarantees encourage the acceptance of proposals from incompetent or inexperienced contractors, and the selection of pavements of doubtful desirability. How often do we hear the statement made in connection with the awarding of street pavement

contracts: "The contractor may not be reliable, or the pavement may not be successful, but we have the surety company bond, or the cash retained to back the five-year guarantee."

In twenty-five years' experience in the street paving business I have seen many paving contract guarantees defaulted, but I have never seen a pavement made good through a guarantee bond or a cash retainer, when the pavement or contractor failed, or when it was against the business interests of the contractor "to make good." There may be such cases, but if there are, they are usually the "exception which proves the rule."

General Policy.—Finally, the best interest of the city in the construction of pavements will be conserved, as it is in all other classes of construction, by the adoption of the following policy:

(1) Decide upon the form of construction best suited for each particular case.

(2) Prepare careful plans and specifications for the work, and give the construction the closest and best expert inspection and supervision.

(2) Take entire responsibility for the results. In the long run this policy will produce better pavements and at lower costs, than will the apparently attractive, but misleading maintenance guarantee system.

Separately Molded Members for Canal Construction.

At a number of places in southern Germany small rectangular canals and flumes have recently been constructed in part of separately molded members. Some of them are used as flumes for small power plants and some for the water supply of industries. Two conditions have led to the adoption of this construction; in some cases the new structures replace older ones and the separately molded type was adopted in preference to the monolithic in order to lessen the length of shut down, the newer type lending itself to more rapid construction than the older; in the other cases the flumes and canals were built in the ground where the use of forms would have required considerable extra excavation, increasing the cost and the required time. The separately molded parts are in the shape of an angle, each being a section of one side wall and a portion of the adjacent bottom. The length of the attached bottom and the reinforcement are varied in accordance with the depth of the flume. The sections are placed side by side forming continuous side walls. Grooves in the ends of the sections are filled with mortar to make a tight joint. The reinforcement of the portion of the floor between the ends of the molded pieces is then laid and attached to the rods projecting from the sectional members. The floor is concreted in the usual manner. It is claimed that very good interior surfaces are obtained and that the friction loss is very low.

One of the flumes described in "Armierter Beton," from which these notes are taken, is 11.15 ft. wide, and 3.94 ft. deep. It is built in a cut and the side walls are reinforced to take the earth pressure with the flume empty. The top of the wall has a thickness of 3.15 in. and the bottom, just above the junction with an increased section near the floor, 4 in. The ground at this point was not sufficiently firm to allow the canal to be placed directly on it and a base course of lean concrete 6 in. thick was laid. Upon it is the reinforced floor, 3.15 in. thick. In some cases the flumes have been covered, separately molded slabs, reinforced to take the fill, being used. A construction of this type was also employed in Munich for a new underground line for the post office system. In this case the tunnel was built in a sheeted open trench which later was backfilled. The construction described is known as the Eschenbrenner system.

Water Proofing Concrete

According to Professor Ira L. Baker, when alum and soap are used as water-proofing for concrete, the alum in powdered form may be mixed with the dry cement or the sand, and the soap may be dissolved in the water employed in mixing the concrete, or both the alum and the soap may be dissolved in the water. The former is probably the safer method in practice, since with the latter method the water must be thoroughly stirred while the two are being mixed, or the precipitate may form in large masses, which it is practically impossible to break up; and, further, the water must be kept stirred to prevent the compound from accumulating on the surface. However, the alum is more easily dissolved than the soap, and hence the alum may be dissolved in, say one-fifth of the water, and the soap in the remaining four-fifths, and then the two portions may be mixed together. The alum and the soap combine and form a finely-divided flocculent, insoluble, water-repelling compound which fills the pores of the concrete and decreases its permeability. The best proportions are: Alum one part and hard soap two parts, both by weight. Soap varies in its chemical composition, and hence a single proportion cannot be stated which will be chemically exact for all cases. The above proportion is in round members the relative combining weights of alum and average hard soap. Any reasonably pure soap will do. It is difficult to dissolve more than 3 per cent. of hard soap in cold water, and hence this practically limits the amount of alum to 1.5 per cent. and of the soap 3 per cent. These amounts will give a precipitate equal to about 3 per cent. of the weight of the total water. The amount of precipitate formed in the pores of the mortar or concrete will depend upon the amount of water used in the mixing.

CONCRETE CASINGS FOR WOODEN PILES have been used with great success in wharf and bulkhead construction on the San Francisco water front by the Board of State Harbor Commissioners. These casings are reinforced-concrete hollow cylinders cast in any required size on shore and allowed to set there until needed. In the application of these casings the wooden pile, of whatever size and length required, is first driven to the desired depth, and the casing then slipped over the pile, and in turn, is driven as far as desired. Then the interior of the casing is pumped out, the mud or sand removed to the required depth and the annular space around the wooden pile filled with concrete. For the bottom of the casings special shoes are provided which fit reasonably close around the wooden pile and serve to space the casings around the pile thus ensuring a uniform thickness of concrete filling and preventing any large amount of mud or sand from entering the casing during the driving. In the San Francisco work casings 24 ins. in diam and from 22 to 56 ft. long have been used. For longer lengths a special splice is provided.

The competition for plans for the new tuberculosis hospital at Winnipeg resulted as follows: (1) George Teeter, (2) C. W. Chivers, (2) Wm. Bruce.

Causes of Faulty Concrete Construction

Details of Experiments—Inefficiency and Haste most Frequent Causes of Failure—Practical Notes on Building Walls and Floors

A common occurrence in the failure of concrete work caused by faulty aggregate, and in which the cement had been hurriedly and ignorantly asserted to be the cause of failure, is where a clay ballast or brick-rubbish aggregate is used, which contains an excess of sulphate of calcium or similar harmful ingredients, says the Builders' Journal (London).

Experiments to illustrate such an instance of concrete failure due to the aggregates employed have been arranged, with the following results. In the case of a large bulk of concrete composed of six of aggregate to one of cement, a well burnt and clean clay ballast was used with furnace cinders and sand in the proportions of three parts, two, and one respectively.

The concrete bulk after some weeks hardening commenced to expand and disintegrate and, as usual, the quality of the cement was first suspected. After a very thorough investigation, however, into the quality of the cement this alleged cause was abandoned, as the produce was found to be sound in every way. Then an inquiry into the separate aggregates took place, and sample blocks were prepared as follows and kept under supervision, viz.:—

A. Cement and furnace cinders......(3+1)
B. Cement and sand ....(3+1)
C. Cement and ballast ....(3+1)

And after some ten days' exposure to the atmosphere it was found that block "C" disintegrated in the same way that the bulk concrete had expanded and fallen to pieces. The two sample blocks of the same cement when separately mixed with the sand and cinders forming the other portions of the aggregate were perfectly sound in every way. An enquiry was then made into the quality of the brick rubbish or ballast used as the main aggregate, with the result that it was found that an average sample contained sulphate and sulphite of calcium equal to 9.51 per cent., and the concrete bulk expansion must be attributed to expansion caused by those substances. In explanation of this result it might be added that the sulphate is contained in the original clay probably as pyrites, and upon burning the clay for ballast the sulphate becomes a sulphite. But in the concrete the oxygen contained in the atmosphere enters into combination with the sulphite, and forms a sulphate again, and in so doing expands and disintegrates the concrete.

Old Plaster Cement.

Great care is necessary in dealing with old concrete floors where plaster of Paris was the matrice. An instance has occurred where old concrete made 40 years since was broken up and re-used with Portland cement as a matrice, the result of which was the concrete expanded, and a failure was the result. It was necessary to raise an old floor of plaster concrete, and of the same age, 2 ins. This was done with Portland cement concrete, which, after the lapse of some time, heaved up in various places, and examination showed that it was the old plaster concrete that had swollen through contact with the water in the cement.

It is often discovered that monolithic concrete walls after erection frequently disclose ugly cracks, almost amounting in some cases to fissures, and although no great diminution in strength is supposed to result, these cracks militate much in its disfavor. This has always been an objectionable feature to contend with in concrete.

These are caused through the natural phenomena of expansion and contraction with change of temperature. This change of form has been put down to a peculiarity of concrete which other wall and paving substances are not liable to. But this is a mistake, for it is simply the materials of which the concrete is made that expand and contract, and their conversion into concrete in no wise affects this property of contraction and expansion. True, there is none, or but little, palpable evidence of change of form in brick or stone walls, or brick or stone paving, but there is no mistaking it in concrete walls, or concrete paving. The reason is that the change is distributed so evenly throughout the multitudinous mortar joints of brick and stone work that it is imperceptible; brick walls built with cement will often show cracks here and there, usually put down to settlement, but which, in reality, are more often the result of contraction and expansion; if these cracks are watched it will be found that they close in mild weather and open again when the temperature falls.

The use of an unyielding material like Portland cement in jointing long lengths of coping or ridge tiles will cause the same thing. Massive brick piers at the end of a long wall, and against which the stone coping abuts, have been pushed more than an inch from the perpendicular, and ridge tiles lifted completely off their bed and broken from the same cause. According to experts, the linear expansion by heat from 32 degrees to 212 degrees of granite is one part in 1,267, of ordinary brick one part in 1,818, and of fire brick one part in 2,365, or ⅛-in. in 24 ft., and this ratio would apply to concrete walls or concrete paving where the aggregates were of a similar nature, and pro rata to the amount of variation of temperature they were subject to.

It has been usual to charge the matrice with the cause of expansion and contraction in concrete walls, but the quantity used is so small, if seasoned it is so little subject to change of form, and is so evenly distributed, that it perhaps has next to nothing to do with the result, and this is proved by the fact that good cement concrete, no matter whether used for walling, or paving, or other purposes, is unaffected in this way until a considerable change of temperature takes place.

To save the bulging of walls in floor concrete construction, it is best to insert wood expansion strips round all floors before commencing, as was the practice when plaster of Paris was the matrice, and to remove them when the concrete is set, filling in the cavities with sand, and calling the attention of the architect or clerk of works to what had been done, and with what motive. The cost is trifling and any future trouble need not then interest the floor contractor.

Increased Use of Metal Building Material

Some Interesting Facts concerning its Development—Fireproof Qualities a Strong Recommendation—Its Adaptability—Classic Styles of Design

The extent to which metal has forced its way into architecture in modern building is remarkable when it is considered.

A noteworthy use of metal building material is that of embossed sheet steel interior finish. Architects and builders have taken advantage of every opportunity to incorporate other metal building material in their work, and few of the experienced, progressive ones have made an exception in the case of metal ceilings. A material combining to so large an extent exactly the artistic and practical qualities required for the purpose has more than ordinary claim upon the favor of the architect and builder. An art metal ceiling is no longer considered merely a "decoration." It is recognized that from the standpoints of fire-protection, sanitation, durability and beauty of appearance its use is almost a necessity in the construction of such buildings as stores; theatres, hotels, club-houses, etc. Nearly every city, town or village in the Dominion has demonstrated the fire-proof qualities of metal ceiling. Fire meets a decided check in a metal ceiling. If the walls are also covered with this material the fire is almost certainly confined to that room.

Louis XIVth Ceiling in Hyatt Avenue Methodist Church, London, Ont.

Other important facts that an architect should consider in this connection are: that a metal ceiling is unaffected by ordinary dampness or heat such as would warp, stain and crack, wood or plaster; that it is not loosened or injured by the vibration or jarring of the building; once up it remains as long as the building stands without any attention whatever except, possibly, an occasional coat of paint. The only enemy metal has is rust and this is prevented from damaging a metal ceiling. When desired this material may be applied both sides and all edges of each piece by the makers. It is therefore permanent.

The cost is little, if any, greater than that of plaster and any but the most elaborate and complex designs may be erected by an ordinary mechanic with the assistance of the construction plan supplied free with each each ceiling. When desired this material may be applied over damaged plaster by first covering the latter with half-inch wood. These practical or useful advantages of metal ceilings. Its development from an architectural as an interior finish.

So much for the mechanical features of embossed etal ceilings. Its development from an architectural standpoint is a story in itself. When the Germans first used steel plates for the inside lining of factories and other such buildings (about 1840), they did so altogether for the fire-protection afforded and paid little or no attention to the appearance. The embossing was shallow and done mostly to make the sheets rigid and more easily fitted together. For some fifty years thereafter the only improvement made in the appearance of the material was to stamp in it stereotyped patterns, mostly to make the sheets rigid and more easily fitted together. For some fifty years thereafter the only improveent made in the appearance of the material was to stamp in it stereotpyed patterns, mostly indiscriminate and reckless jangles of lines with no effort to produce anything better than a pleasing effect.

Then about fifteen years ago came a realization of the wonderful possibilities of art metal ceiling and with it a revolution of the industry. A specially, soft, "tough," cold-rolled steel plate was made which permitted of much deeper and finer embossing. The idea of classifying the designs was also originated—possibly the most important step forward—raising metal ceiling from merely a "fire-proof lining" to a high class interior finish. By this system, instead of aiming merely at ornament, the designers drew and modelled their patterns after the various styles of interior decoration developed at different periods of the world's history.

A Graceful Ceiling in a Winnipeg Public School.

The idea has been further developed, until to-day the purchaser is offered designs that are founded on such

A dainty, tapestry-like Empire Design in Columbia Hall, Sault Ste. Marie, Ont.

classic styles as Louis XIV. Greek, L'Art Nouveau, Romanesque, Gothic, French, Italian and German Renaissance, Rococo, Empire and Colonial Art. From the hundreds of designs offered it is easy to select a pattern to suit a room of any size or shape, or to harmonize with any architectural style.

It is difficult to foretell the future of embossed metal interior finish. Though its use has heretofore been largely confined to ceilings it is now coming into use as a well-covering and it should prove just as popular for this purpose. At any rate, the development of the metal ceiling industry has helped to solve the problem of a fire-proof and attractive interior finish for stores, churches and other such buildings, and as the qualities of the material become better known it should be more largely used in residential work.

In building New York's greatest tunnel, the engineers in charge have decided to go back to Roman methods, the rock tunnel being considered cheaper and more durable than iron pipe through the earth.

The real development in tunnel building began in Rome more than three hundred years before the Christian era, when the first of its nine great tunnels was designed by Censor Appius. Shafts were sunk and borings made through solid rock, but the engineers of that day differed from those of to-day in that they did not go far into the earth, immense stone aqueducts being built across rivers and valleys. There was little knowledge of explosives and very little machinery compared with that in use to-day, but skilled workmen using such chemicals as were known to have expanding power and employing wedges of dry wood which expands through absorption of water accomplished wonderful results. The work, of course, was slow, but tunnel-building came to be the special ambition of each successive ruler of Rome during the republic, just as pyramid-building had been with the rulers of early Egypt. No expense was spared to realize the ambition of each ruler, and they still form monuments to their memory. Thirty thousand men were employed part of the fourteen years it took to construct the Claudia, a famous Roman tunnel which cost about three million dollars of our money. The tunnels of different periods varied in length, the longest probably being the Anio Vetus, which is forty-three miles in length and eight feet in height, part of it being in aqueduct form made with huge blocks of stone.

Careful study of the present condition of these Roman tunnels built so many years ago convinced a board of eminent engineers that a return to the first principles of tunnel-building, with a modern use of explosives, would give the people of New York an enduring work. The proposition met with great opposition at first, but the plan has been finally adopted by the Board of Estimates and bids will soon be asked for accomplishing the great undertaking.

The course of the tunnel will be as follows: Receiving the Catskill water supply at the Hillside reservoir near Yonkers, it will pass under Van Cortlandt Park, the Jerome Park reservoir, under the Harlem river at Highbridge, under St. Nicholas and Morningside Parks and then diagonally across Central Park. Thence the tunnel will be carried under Sixth avenue to Thirty-fourth street, and then directly south to the Delancy street terminal of the Williamsburg bridge. It will continue directly south to the terminal of the Manhattan bridge in Brooklyn, and from that point will be carried under Fifth avenue to Fort Hamilton, Manhattan. The Bronx and Brooklyn will receive the water direct from the tunnel, while huge mains under the narrows will carry the supply to Richmond and into Queens. The capacity of the new tunnel will be 500,000,000 gallons daily, or about the amount at present being consumed in the city.

The following figures give some idea of the diameter and depth at different points:

At its beginning the tunnel will be fifteen feet in diameter and will gradually be reduced to ten feet at Fort Hamilton. The most remarkable thing about this greatest of all water tunnels is the immense depth to which it will be sunk that it may follow the solid rock. At Yonkers it will be 200 feet under ground. It takes a dip to get under the Harlem river, going down 450 feet. From West 106th street to about 34th street it will be only about 200 feet below the surface. Where it passes under the East river it will be about 800 feet below the sea level. This great depth is rendered necessary by the weakness of the underlying rock which supports Manhattan Island at that point. Such a depth insures, in the opinion of the engineers, strength enough to render the tunnel absolutely safe and free from leakage.

The entire tunnel is to be lined with a thick layer of concrete.

A Handsome Panelled Ceiling in Hotel Rotunda.

The Contract System versus Day Labor

Interesting Letter from the City Engineer of Fort William—Contractors should have No Difficulty in Obtaining Work at Profitable Figure

Fort William, Ont., Nov. 24, 1910.

Editor "Contract Record":

With reference to your discussion of the day labor question, I think possibly the experience of the city of Fort William may provo of interest.

Fort William during the past five years has spent about two and a half million dollars on construction work of all kinds, of which over two milions have been carried out by day labor, under the writer's direct administration. Consequently, I feel that I can speak with some authority on the respective merits of the two systems as applied to the conditions, location and population of the city of Fort William, which at present has a population of about 23,000 people, and at the time of the writer's first connection therewith in 1906 had probably only 7,500.

At the outset, it is also reasonable to state that conditions that are almost controlling features in Fort William would be entirely unknown in a large city or even a small one located closer to the large centres of population.

Fort William is in a comparatively isolated situation, a long distance from the haunts of the true contractor. By "true contractor" I mean one of experience and training, and possessed of plant and a following of capable superintendents and foremen. Personally I have made serious efforts to persuade such contractors to tender on our work, without success, although this result is easily understood. No contractor wants to do comparatively small work a thousand miles from his base, in a portion of the country with which he is unfamiliar. As a result, only local talent has, in the past, been available for our work. Consequently it has not been difficult, as a general rule, to do day labor work at a lower cost than by contract, and the quality of the work has in no way suffered, in fact quite the reverse.

Local conditions have practically forced us to do a large amount of day labor work, and this being so, we have endeavored to bring its efficiency to as high a point as possible. Of course, this point does not yet approximate perfection, and probably never will, but we have tried to eliminate many of the usual objections to the day labor system.

The city council, although divided on the respective merits of day labor and contract work, are thoroughly agreed that my hand shall be absolutely untrammelled in the execution of the work. Resolutions are duly passed to this effect, and council, both individually and collectively, have loyally ived up to their letter and spirit. Council sets absolutely no limit as to wages paid either for laborers or foremen, and has never refused any plant or equipment asked for. As a consequence, we have nearly a hundred sewer men, mostly Finns, selected from some three or four thousand men, who have passed through our hands during the past five years. These men are paid from 25c. to 30c. per hour according to the difficulty or arduousness of the work, whereas the average wage is from 20c to 22½c. Foremen have been retained by the same process of selection, and we have discovered several of the first grade paid from $4.00 to $6.50 per day. We have not a single political or aldermanic favorite on any job. For any man to pose as such insures the fact that he will get no work on any city gang. The only concession made—that a contractor might not make—occurs when work opens in the spring and jobs are not plentiful, when preference is given, other things being equal, to married men with families, but there have always been enough of these men in the front rank of our selected gangs to avoid the least detriment to the work.

I agree that work of any size needs an inspector, whether done by day labor or contract. In the former case, the inspector keeps an elaborate daily cost record, which is essential to the success of any system of construction.

Employers liability insurance is carried on all important work.

We have also organized a city yard that is self supporting. All material, plant and equipment passes through it with a sufficient percentage added to cover cost of handling. Plant, such as concrete mixers, trenching machines and steam rollers are charged against each job on a rental basis that will repay their cost well within their life and the job stands minor repairs. Tools are valued on their return from a job and credit given on a conservative secondhand basis, and every effort is made to have every job stand on its own feet in every particular.

Material is bought largely by tender and the cost has averaged appreciably lower than that purchased by contractors.

The maintenance problem is met as far as possible by charging the job an estimated amount to cover repairs for one year—as in our contracts. Up to the present this has practically meant regarding the street in which any trench has been opened. Sidewalks by day labor have all been on streets involving raises of from two to four feet in grade. They have been therefore built "hollow" with reinforced concrete slabs supported on two walls. Some have been down four years, but we have not had to spend a cent in repairs so far.

Our paving is all asphalt block and no repairs have been made within the period of guarantee.

In bidding against a contractor, or, in other words, advising council what is a fair price for the work, a practice made necessary by unscrupulous contractors in the years that have gone, it is fairer to do so before bids are opened as one's judgment is not clouded by other opinions as to the probable cost; but I certainly make every effort to place myself in the contractor's position and give him every chance. Often the contractor is lower than my estimate, and then almost invariably he gets the work, but when ordered to be done by day labor, nine times in ten, the cost is considerably below the estimate, due often no doubt, to good weather and favorable conditions, but certainly not to any scamping or cross charging or any of the other peccadillos suggested by some of your correspondents, and if the estimate is exceeded I have no qualms about saying so. Of course, it is up to me to say why, and it is very seldom that excellent reasons do not exist. Again, necessary changes in the work are paid for in the case of the contractor as extras without question, but the engineer's only remedy is an explanation which may not be believed. Briefly, any contractor who has secured work in this city within five per cent. of my figures has made good money—although they are not well equipped for the work.

I consider too, that any contractor who cannot, by his personal presence, knowledge training and ability, make a fair profit under the figures I ask him to compete against, in the large majority of cases, has no right to call himself a contractor. But, being only human, I occasionally under-estimate, and also unforeseen circumstances sometimes arise which swamp engineers as well as contractors.

There seems to be a disposition in this correspondence to assume that an engineer is anxious to do work by day labor. Personally, I think it adds a great deal to his work and worries. Broken machinery, collapsing cofferdams, keeping the work supplied with material, floods, storms, the vagaries of dynamite, caved-in tunnels and other troubles borne by the contractor, cause many a continuous spell of from 18 to 48 hours work for which he gets little credit, less thanks, and no pay. Some contractors give a great deal of trouble also, but fortunately they are a small minority.

As to the clauses making the engineer sole arbitrator, I think this arrangement is best for both sides, if the engineer will act in a perfectly just and impartial manner. He knows, better than anyone else, the troubles that have arisen on the work and can collect and keep data enabling him to reach a just decision, and as I understand the law, if his interpretation of the specifications is not just and fair to both parties, no court would uphold his decision. The contractor would be in a better position to get an adjustment than the city, if the engineer were otherwise than just.

It may also be a surpise to "Contractor," of Montreal, to know that with most city engineers the retention of their job is the last thing they worry about. If he will compare the names of the present city engineers of Canada, and particularly Western Canada, with those of five or even two years ago, the extraordinary number of changes do not indicate a serious or determined effort on the part of the profession to hold their positions at the cost of either honor or self respect.

In conclusion, I think there is no reason, at least in the average Canadian city, why both systems of doing work cannot be made satisfactory. Both have merits and both have faults, and it depends very largely on local conditions as to which system will develop the largest proportion of merit and demerit. There are also many classes of work that are especially adapted to one system or the other. Every city should use the same freedom of action as a railway company in the prosecution of its work.

Yours truly,
H. S. Hancock, Jr., City Engineer.

1910 a Busy Season at Ottawa

Building Materials still in demand—Current Prices—Much Development Work Contemplated—Trade Notes of Interest

Ottawa, Nov. 26, 1910.

It has been decided that hypochlorite will be added to Ottawa's water supply. Engineer Hazen in his report on the water supply for this city recommended that it be taken from McGregor's lake which is of sufficient altitude to do away with the present pumping system altogether, but if, in the meantime, the supply became impure to the extent of causing disease, the water might be treated with hypochlorite. City Engineer Kerr was of the opinion that the supply up to the present time was good, and as a proof there is little or no contagion in the city whatever. The council nevertheless did not want to take any chances, and for this reason decided to install the system. The tanks will be installed in the present power house and the hypochlorite will be added to the water in the intake pipe before it reaches the cylinders. Going through the pumps will be sufficient to properly mix it. The system will cost about $1,000 to install and about $5,000 a year to operate.

Consulting Engineer W. F. Tye of Toronto and City Engineer Ker will cooperate in presenting a report to the council on the railway entrances and exits in connection with this city. There are four railway companies to deal with. The Grand Trunk, Canadian Pacific, and Ottawa, and New York lines, all now come into Central station. However, the C.P.R. is not satisfied with present conditions and wants permission to close up the Rideau canal for some distance, place their tracks in the bed and tunnel under the city in order to connect with the Union station and proceed west. At present the company's trains have to go through Hull to get from one station to the other. Then the Canadian Northern is applying for entrance into the city. To take up the entire question and put the council in a position to permanently settle its course in this regard is the undertaking of the engineers.

Nineteen hundred and ten has been a heavy year in street improvement work in the city, and the indications are that next year will be even heavier. The city officials expect next summer that the 12 miles of sidewalk and 4 miles of pavement, the approximate figures this year, will be exceeded.

There is a motion at present before the city council to issue debentures to pay for extensions to water mains. It has heretofore been the practice of the waterworks committee to pay for water main extensions out of current account, while other cities issue debentures for this extensions. The cost of extensions of water mains this year was in round number $40,000 and it is a heavy drain on the resources of the department. Since these mains last for upwards of 20 years they should be paid for by 20-year debentures instead, is the argument of the chairman of the waterworks committee.

The construction companies report that the demand for building materials is very heavy for this period of the year. This is much influenced by the big buildings in course of construction. In the fall, of course, contracts are being signed up for masonry and the like at slightly lower prices in the case of big jobs than could be secured at other seasons of the year. For example, one contract was signed this week for masonry work at $5 per tois, which is particularly low. It usually runs about $6 to $8. This, of course, is where the contractor only furnishes the labor. The ordinary stone for walls is sold, delivered, at $8.50 per tois which is about the same as it has been all summer. There is a slight drop in the price of cut stone for sills and lintels. It is being quoted now as low as 50 cents per running foot, both native and Indian stone. Rough stone for this purpose is sold at about 20 cents per superficial foot. Large stone to be cut is sold at about 30 cents per cubic feet. The prices charged for laying brick remains pretty steady. One contract for solid brick work was signed up for $8 per thousand where the contractor furnished only the labor. Where the brick-layer furnishes the lime and sand, the prices range from $9 to $12 per thousand, the higher prices for veneer work.

A campaign will be started very soon to raise upwards of $80,000 for the enlarging of St. Luke's hospital, which is much too small for present. Horwood, Taylor & Horwood are preparing preliminary plans. The building will be fire-proof construction.

There has been an exceedingly heavy demand for cement in Ottawa during the past year. An inquiry from the different firms selling cement in this city and Hull, produces the calculation that about 110,000 barrels were sold up to January last. The prices remain very steady, with no decreases as yet. In carload lots it is selling at $1.70 and in lesser amounts at $1.90.

The Otis-Fensom Elevator Company are installing nine elevators in the city just now. Four in the new central station, four in the Chateau Laurier and one in the [illegible] building.

The Cost of Company and Contract Work

An Example of the High Rate of the Former in Railway Tunnelling — A Threadbare Fallacy: "Saving the Contractor's Profit"

Although most railway managers have demonstrated again and again that contract work is cheaper than work done with company forces, every once in a while the decision is made that some important or difficult piece of railway construction had better be carried out by forces employed directly by the railway company. An instance of this kind was the building of the Cascade Tunnel by the Great Northern Railway in 1897 to 1900. It so happened that in 1886 to 1888 the Northern Pacific Railroad built the Stampede Tunnel through the same range of mountains by contract, and at a time when wages were higher. Since these two tunnels are so nearly comparable, in the character of excavation and in length, the N. P. tunnel being 9,844 feet long, and the G. N. tunnel being 13,813 feet long, a tabulation of cost becomes very instructive. The following costs are brief abstracts of much more detailed statements given in the 1910 edition of the "Handbook of Cost Data," by Halbert P. Gillette.

COST OF NORTHERN PACIF7IC TUNNEL.

	Per lin. ft.
Excavation, standard section, at $78.00	$ 78.00
Extra excavation, 3.2 cubic yards at $4.50	14.40
Traffic charges	0.77
Total	$ 93.17
Timber lining, 305 feet B. M. at $35.00	10.68
Brick and concrete lining (by company forces)	54.08
Track and ballast (by company forces)	2.47
Engineering	5.00
Grand total	$165.40

COST OF NORTHERN PACIFIC TUNNEL.

Labor excavating tunnel	$ 60.60
Explosives	7.40
Power	22.50
Tools	10.00
Machinery	16.20
Buildings	3.50
Personal injuries	2.10
Hospital expenses	1.10
Total	$123.40
Timber lining	9.40
Concrete lining	43.50
Track and ballast	2.80
Engineering	4.30
Grand total	$183.40

We see that the Great Northern tunnel cost 11 per cent. more than the Northern Pacific tunnel; but if we compare only the work done by contract on the Northern Pacific tunnel with the corresponding work done by company force on the Great Northern tunnel, we have $93.17, as compared with $123.40. This shows that the company force work cost 33 per cent more than the contract work.

It remains only to determine whether or not the contractor for the Northern Pacific tunnel made a profit. Fortunately, careful costs were kept, and, as recorded in Gillette's "Handbook of Coct Data," it is clear that the contractor made a handsome profit, in spite of the fact that the lowest priced workman received $2.50 per day. Moreover, the contractor made more rapid progress on the Northern Pacific tunnel than was made on the Great Northern Company work.

Doubtless the knowledge that this contractor had made a splendid profit was the chief actuating motive that led the Great Northern to attempt to "save the contractor's profit." When will all engineers come to a realization of the fact that a contractor's profits are merely his salary for expert supervision and management? When will all engineers see clearly that a successful contractor is a manager who has been appointed to the position by the most astute selecting agent in the world—competitive strife? When will all of us invariably apply the fundamental law of business management? Namely: "All payments for work should be proportionate to work done."

Incidentally, we may add, the contractor for the Northern Pacific tunnel through the Cascade Mountains, was himself far ahead of his time in that he used a bonus system in paying his employees. Mr. Nelson Bennett, the contractor, was one of the great railway builders of the West. We believe he is still active in the railway construction world. The history of his work on the Stampede Tunnel through the Cascades is a real romance of achievement. It serves to the ear a story as keenly interesting as the best of fiction.—Engineering-Contracting.

Rust, as shown in the Removal of a Seventeen-Storey Building

The Gillender Building, a seventeen-storey structure at the northwest corner of Wall and Nassau streets, New York City, was built in 1896, and removed in 1910.

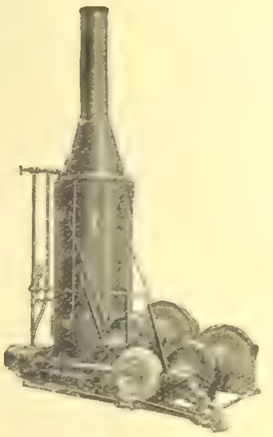
When built, all the columns were encased in solid brickwork. The steelwork received one coat of paint in the shop and two after erection, but on removal, showed little evidence of ever having been painted at all.

From the top to the bottom, wherever the spaces between the brick and steel were filled with Portland cement mortar, there was no rusting, but, wherever the mortar did not fill such spaces completely, rusting had begun. Generally, the under sides of the top and bottom flanges of the floor-beams had begun to show rust, while the web and upper surfaces, having been in contact with mortar, were in good condition.

The worst rusting of all was from the sixth floor down, on the northeast corner, where the columns had been against the adjoining building, on the north side. The cover-plates of these columns looked as if they had never been painted, but had stood in the open, exposed to all weather, for six or seven years. On these columns one-half, in volume, of many rivet heads could easily be removed.

This building had been erected by first-class contractors and with first-class materials; and although the rusting had not yet made the building unsafe, there is no telling how soon it would have become so.

It would seem that if the columns had been encased and filled with wet concrete there would have been little danger of rust, and they could thus have been easily protected from electrolysis. Oil or oil paints should not be placed on steel to be thus encased.



Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

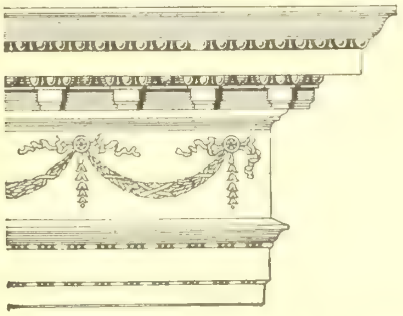
Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

A good appearance is a letter of recommendation; a house well built, a monument to the builder.

—The Philosopher of Metal Town.

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

FOR CONVEYING AND TRANSMISSION

Scandinavia Belt is considered the best Conveyor Belt that has ever been put on the market, for conveying Ore, Rock, Cement, Clay, etc.

It is not made in plies, and will not come apart.

Equally good in wet and dry places.

This illustration shows 20" Extra Stout Scandinavia Belting for conveying Cement.

Write for Bulletins, price lists, and discounts.

Federal Engineering & Supplies Limited
284 Yonge Street, TORONTO

AGENTS: Power Economics Ltd., Montreal. McDougall Hardware Co., Ottawa
Marks-Clavet-Dobie Ltd., Pt. Arthur. Great West Saddlery Co., Calgary.

Agents Wanted in Other Cities.

Personal News and Notes

Mr. Willis McLachlan has been appointed city electrical engineer of London, Ont.

The corner stone of the Royal Alexandra Hospital at Edmonton was laid last week.

A Truro, N.S., dispatch records the death of Mr. K. W. Handy, a well known building contractor. The late Mr. Handy was born at Yarmouth, N.S., in 1846.

The late Mr. J. Z. Resther.

We regret to record the death of Alderman J. Z. Resther, the well known Montreal architect. The late Mr. Resther was born at St. Hyacinthe, Que., in March, 1867. He was prominently identified with the Province of Quebec Association of Architects and the Royal Architectural Institute of Canada. He was elected vice-president of the latter body at the Second Annual Assembly in Toronto, in October, 1909.

The steamer Rupert City arrived at Vancouver, B.C., last week, from Portland with a consignment of 8,000 barrels of cement for the Wells Construction Company, Vancouver.

The building permits issued at Vancouver during the first half of November totalled one and one-half million dollars. This total includes a permit to Donnellan & Donnellan, architects, for a 12-storey office building to cost $650,000.

Mr. F. H. Tingley, C.E., who, for some time, has been connected with the engineering staff of the I.C.R., has resigned in order to accept a position with the public works department at St. John, N.B.

The National Trades and Labor Council, of Toronto, suggest now that the civic building by-law is up for discussion, the question providing better regulations governing the erection and inspection of scaffolding should be taken up. A recommendation to this effect will be sent to the city council.

Mr. Henry Holgate, of the firm of Ross & Holgate, consulting engineers, Montreal, was a recent visitor to Halifax, N.S. Mr. Holgate considers that the streets of Halifax compare favorably with those of any other city in the Dominion, and that the various kinds of paving material used show excellent judgment on the part of the city engineer, Mr. F. W. W. Doane.

Important additions to the Royal Alexandra Hotel, Winnipeg, are contemplated by the C.P.R. In this connection Mr. A. E. Anderson, representing Messrs. E. & W. S. Maxwell, of Montreal, and Mr. E. C. Shankland, consulting engineer, of Chicago, had a conference last week. At the time of writing no decision had been reached.

Mr. F. P. Jones, general manager of the Canada Cement Co., denies the statement recently published by the Toronto press, that there is a shortage of cement. He states that at no time this year has the company had less than 325,000 barrels of cement in stock. The only delay has been caused by shortage of cars. At the present time he says that the company has 400,000 barrels of cement on hand and that the production just now is away ahead of the demand. A large quantity will be carried over into next year. The mills at Belleville and Lakefield, Ont., were not operated owing entirely to the lack of demand.

Mr. Pocock, manager of the London Concrete Machinery Company, Limited, was honorably acquitted at London, Ont., last week on a charge of having detained a posted letter addressed to the Ideal Concrete Machinery Co., of that city. It appears that a Toronto man had been negotiating with the latter concern for a concrete mixer, for which he issued a cheque for $75. The letter was sent by mistake to Mr. Pocock's company. Mr. Pocock called up the Toronto customer by telephone and both thought they were on the right terms. The court held that there was not the slightest evidence of any wrong doing on Mr. Pocock's part, and that if there were any responsibility for the mistake it rested with the purchaser. Mr. Pocock is an alderman of the city of London, and is regarded with the utmost confidence in the building world, with which he has a large connection.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave, guaranteed the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

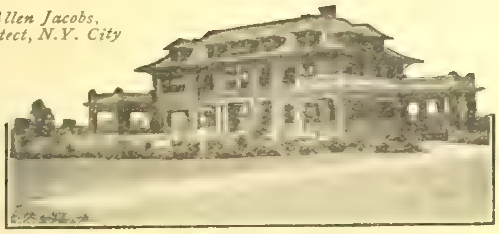
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Brick

is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of obsorption. It is a rich red color, strong and lasts well.

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

ENGINES and BOILERS of all types and sizes. Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established 1882
THE COMMERCIAL
The Weekly Financial Commercial & General Trade Newspaper of the Great West,
Winnipeg Manitoba

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Robert W. Hunt & Co. **Engineers**
Bureau of Inspection Tests and Consultation
Dominion Bureau, Canadian Express Building, MONTREAL
Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada
Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
Bridge and Construction Dep't.
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1640

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

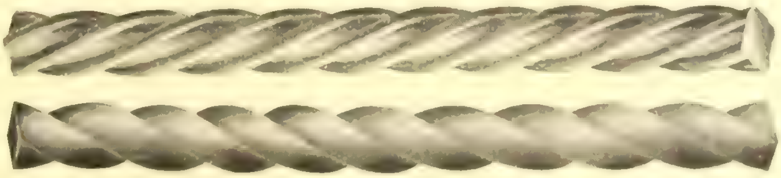
Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing. Also ¼" soft steel rounds.

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. Suburb of Buffalo N. Y.

Toronto Office
117 Home Life Building

Sewer and Culvert **Pipes**

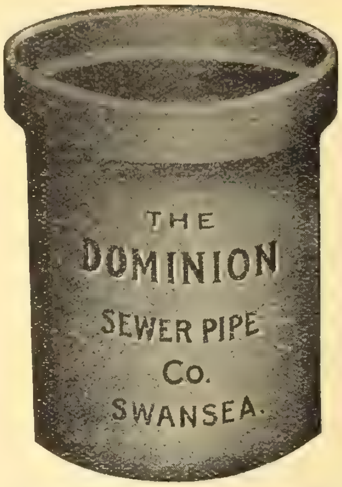
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

American
Sewer Pipe Co.
General Offices: Akron, Ohio, U.S.A.
LARGEST MANUFACTURERS OF
Vitrified Salt Glazed
Sewer Pipe
in the WORLD
For QUALITY
We Simply Invite COMPARISON

Standard and Double Strength
Quality - The Best Made

Sizes, 3", 4", 5" 6", 8", 9", 10", 12", 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:
201 Devonshire St., Boston, Mass.

J. H. NEW, President. RYLAND H. NEW, Vice-President

We Specialize on Quick Shipment

At this time of the year, if you require pipe at all, you want it immediately.

We have earned the name throughout this country of taking care of orders more promptly than any other firm in this business. Our stock is now very complete and we can demonstrate our claims if you will only give us the opportunity.

Quality and Price right too

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Offices:
Nos. 346 and 348 Broadway, NEW YORK CITY U.S A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S ; Hamilton, Ont., London, Ont. ; Montreal, Que. ; Ottawa, Ont. ; Quebec, Que. ; St. John, N.B ; Toronto, Ont. ; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS C IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.
Architects
Toronto General Trust Building TORONTO

Power & Son,
Architects and Building Surveyors
Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis,
(Taylor & Gordon,
Architects
North British & Mercantile Chambers,
80 St. Francois Xavier St., Montreal
Telephone Main 281.

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

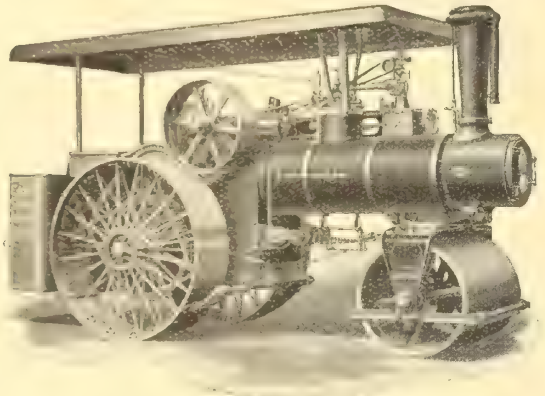
MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

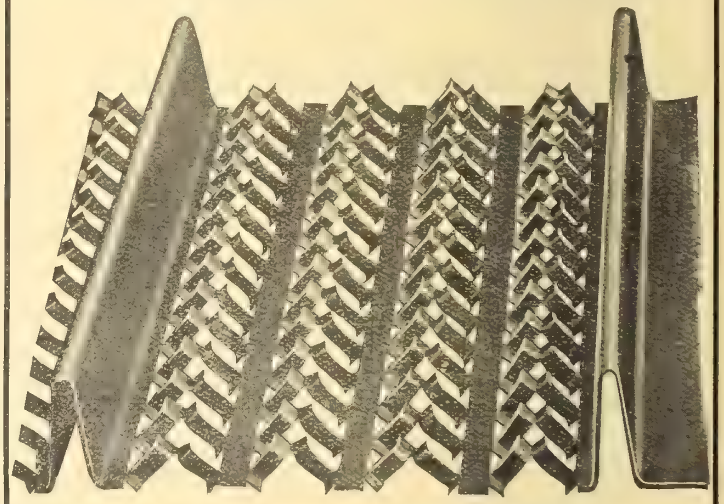
Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

KAHN SYSTEM

Products include

HY-RIB

Combination of metal, lath and chourul in one sheet. Does away with expensive wiring, studding also Form work when used as reinforcement for floor or roof slab.



Trussed Concrete Steel Co.

of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver.	Quebec, Halifax.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

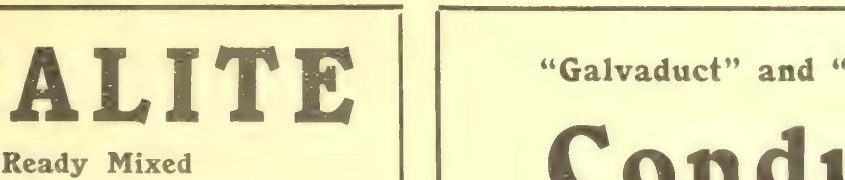
for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF



any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

JAMES TAYLOR
Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work	$10.00 to 11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 8 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off caulking lead, 1½ cents per lb.; traps and bends, 50 per cent

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions. 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.55.

Cement, car lots, f.o.b. Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, $1.05 per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

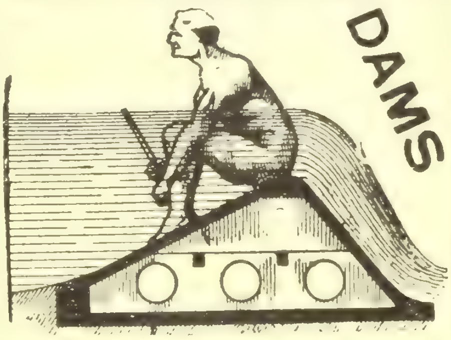
Warnken Hardware Company, Limited, Winnipeg, Man., capital $25,000. Incorporators: Arthur T. Warnken, merchant; Arthur R. Taylor, physician, and Thos. W. Taylor, manufacturer, all of Winnipeg.

Bolduc & McLean, plumbers, Montreal, are stated to have dissolved.

The British Columbia Gazette gives notice of the incorporation of the following companies: Vancouver Furniture Company, Limited, capital, $75,000; Canadian Electric Manufacturing Co., Ltd., capital, $150,000; The Dewdney Gravel Co., Ltd., capital, $250,000.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341 63 Esplanade, E. TORONTO

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

Contractors
Columns, Beam Rests, Beam Hangers, Iron Sills, Sashweights.
The Katie Foundry, Galt, Ont.
Municipal
Water Pipe, Service Boxes, Manhole Frames, Crossing Plates, Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience on Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen s New Cemen

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

We have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

Fine Woodworking

INTERIOR FINISH

in

QUARTERED OAK, CYPRESS,
YELLOW PINE, BIRCH, ETC.

S. Anglin & Company
Kingston, Ontario

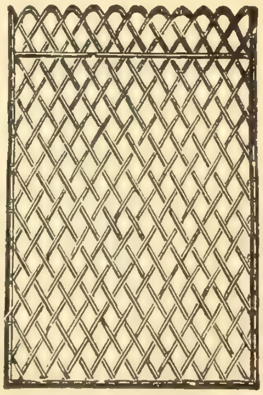
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

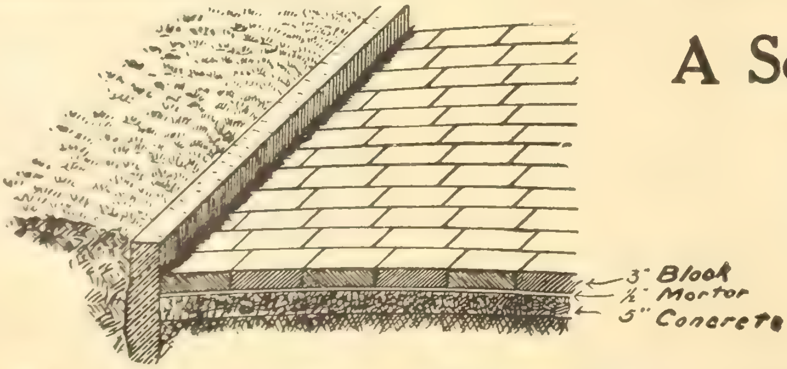
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

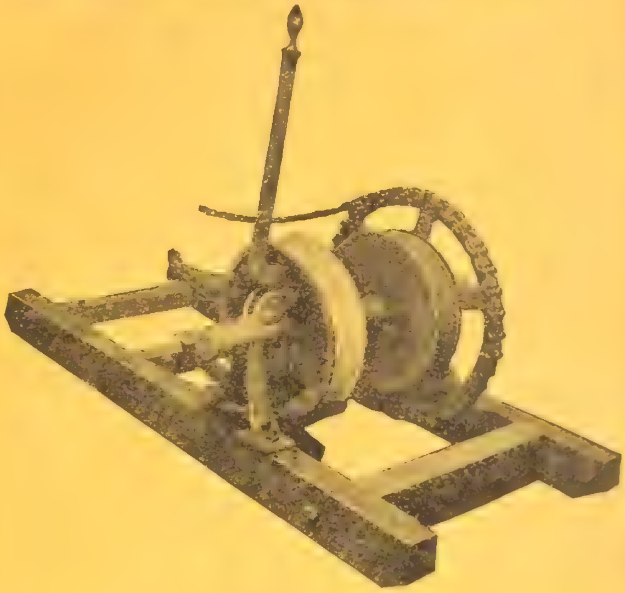
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work
Mortar Conveying
Well Digging
Bridge Building
Sewer Building
Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited

Engineers and Machinists
London, Canada

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY

Goulds Pump Co.

Coristine Building, Montreal

Phone Main 1054

Works: Seneca Falls, N.Y.

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

"Some Equipment With Merit"
FOR THE CONTRACTOR

Hoisting Engines

of all sizes

For
Contractors
Quarrymen
Bridge Builders

Railroad, Dock and Sewer Construction; Dredging, Hauling
Erecting and Driving; Ships, Mines, Docks, etc., etc.

ELECTRIC HOISTS BELT HOISTS

"Ransome" Concrete Mixers

in all sizes — all styles of power
"The best mixer to be obtained"

We are now offering a No. 4 Ransome, suitable for all classes of small work.

It will pay you to investigate

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec Dunn Bros., Winnipeg Ritchie Contractors Supply Co., Vancouver

Vol. 24 Toronto, December 7, 1910 No. 49

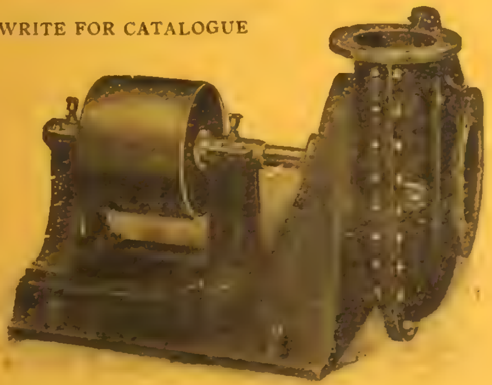
ESTABLISHED 1886

Contract Record

Brick and Clay Products Number

Power and Steam Pumps
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE



The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

TRADE MARK REDCLIFFE

TRADE MARK REDCLIFFE

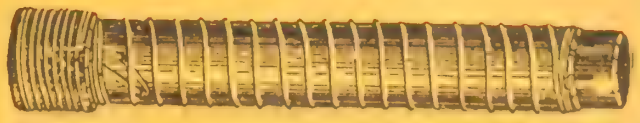
"Redcliffe"

Corrugated Iron

Gets the Preference when Quality Counts

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

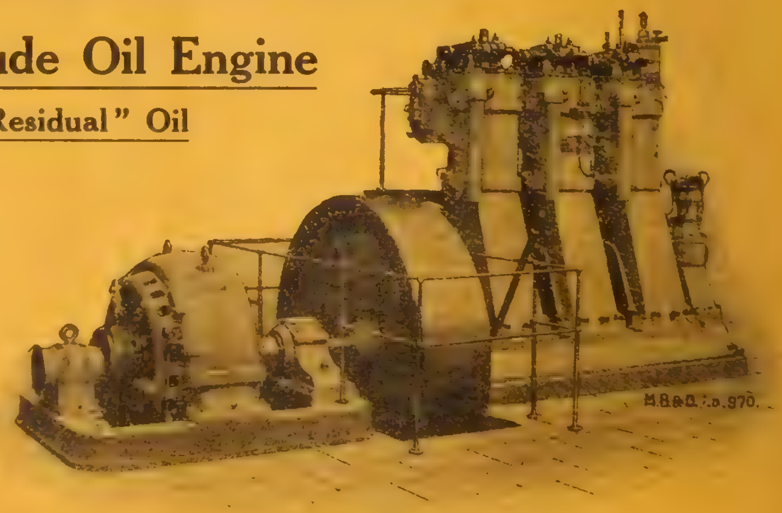
3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil



No Ignition Gear
No Producer
No Chimney

No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdown
Cheaper Buildings and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page
Canada Wire Goods Mfg. Co 110
Dennis Wire & Iron Works 119

Belting
Federal Engineering & Supplies, Ltd 95

Boilers
Inglis, John 36
Jenckes Machine Co. 2
Leonard & Sons, E 113
Marsh & Henthorn 95
McDougall Caledonian Iron Works 35
Mussens Limited 44
Taylor-Forbes Co
Waterous Engine Works Co. 15

Brick
Gibb, Alexander 16
American Enamelled Brick Co. 25
Canadian Pressed Brick Co. 25
Deckman Duty Brick Manufacturing Co 100
Don Valley Brick Works 27
Dunn Wire Cut Brick Co 33
Hamilton Pressed Brick Co. 18
Milton Pressed Brick Co. 8
Port Credit Pressed Brick Co. 21
Toronto Pressed Brick Co. 15
Beamsville Pressed Brick Co.
Montreal Terra Cotta Lumber Co. 9
Terra Cotta Pressed Brick Co. 14
National Paving Brick Association 31
Northwestern Terra Cotta Co. 32
Metropolitan Paving Brick Co. 17
Silicate Brick Co 16
Clayburn Brick Co. 22
Anvil Island Brick Co. 23
Schultz Brothers 20
Sydney Pressed Brick Co. 32

Brick Machinery
H. C. Baird & Son 103
Clay Dry Kiln Co. 101
Berg Machinery Manufacturing Co. 102
W. B. Dickey 31

Bridges (Steel)
Canadian Bridge Co. 114
Cleveland Bridge Co. 114
Dickson Bridge Works
Dominion Bridge Co. 114
Phoenix Bridge and Iron Works 115
Pennsylvania Steel Co. 114

Cement Page
Alsen Portland Cement Co. 119
Britnell & Co. 108
Bremner, Alex. 105
Canada Cement Co. 3
McNally & Co., W. 113
Morrison & Co., T.A. 116
Rogers, Alfred 4
Rogers Supply Co. 43

Conduits
Conduits Co., Limited 105

Concrete Pipe
Lock Joint Pipe Co. 106

Concrete Mixers and Machinery
Canada Foundry Co. 100
Cropp Concrete Machinery Co. 6
Hopkins & Co., F. H. 120
Jenckes Machine Co. 2
London Concrete Machinery Co. 35
Mussens Limited 44
Morrison & Co., T. A. 116
Rogers Supply Co. 43

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 117
Buffalo Steel Co.
Canada Wire Goods Mfg. Co. 110
Hamilton Iron & Steel Co. 104
Trussed Concrete Steel Co. 119

Contractors' Plant
Beatty & Sons, M. 110
Hepburn, John T. 46
H & E. Lifting Jack Co. 115
Hopkins & Co., F. H. 120
Katie Foundry Co 117
Marsh & Henthorn 95
Meaford Wheelbarrow Co 110
Mussens Limited 44

Crushers (Stone and Rock)
Hopkins & Co., F. H. 118
Jenckes Machine Co. 2
Mussens Limited 44
Morrison & Co., T. A. 113

Corrugated Iron
Galt Art Metal Co. 111
Metallic Roofing Co. 95
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 5
Roofers Supply Co. 43

Contractors Page
McIlwraith, Jas. A. 116
Nadel & Adler 116

Drills
Beatty & Sons, M 110
Canadian Rand Co. 1

Deafening Felts
Cabot, Samuel, Inc. 113

Drilling Contractors
Harvey, J. 117

Dredges
Beatty & Sons, M 110

Engines
Canadian Boving Co. 2
Inglis, John 36
Jenckes Machine Co. 2
Leonard & Sons, E 113
Mussens Limited 44
Waterous Engine Works Co.

Engineers (Civil and Mechanical
Barber & Young 116
Chipman & Power 116
Bowman & Connor 116
Farmer, John T. 116
Fuce, Edw. O. 116
Galt Engineering Co., John 116
Glaubitz, H. J. 113
Hunt & Co., Robt. W. 36
Inglis, John 116
Kennedy, Jas. C. 116
Lea & Ferguson 116
Mace, T. Harry 116
Mitchell, C. H. 116
McRae, John B. 116
Moore & Scollan 116
Taylor, James 116

Fire Apparatus Page
Morrison & Co., T. A. 116
Seagrave, W E. 113

Fireproofing Terra Cotta
Don Valley Brick Works 27
National Fir proofing Co. 24
New Jersey Terra Cotta Co. 25

Fireproof Doors and Windows
Douglas Bros. 112
Mussens Limited 44
Ormsby, A. B. 5

Gauges, Steam, etc.
Marsh, Jas. P. 110

Granite and Marble
Laurentian Granite Co. 116
Missisquoi Marble Co. 110
Rogers Supply Co. 43
Smith Marble & Construction Co.

Glass
Chance Brothers & Co.
Consolidated Plate Glass Co.
Luxfer Prism Co.
Thompson & Co., B. & S. H.
Toronto Plate Glass Importing Co.

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 113
Taylor-Forbes Co.

Hoisting Machinery
Beatty & Sons, M. 110
Inglis, John 36
Jenckes Machine Co. 2
Hopkins & Co., F. H. 118
London Gas Power Co. 119
Marsh & Henthorn 95
Mussens Limited 44

Hydrants
Canada Iron Corporation 105
Gartshore-Thomson Pipe Co. 104
Kerr Engine Co.

Interior Fittings
Lickleys Limited 109

Lime
Christie, Henderson & Co. 32
Jamieson Lime Co. 26

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 **28 King Street West, TORONTO**

MODERN.

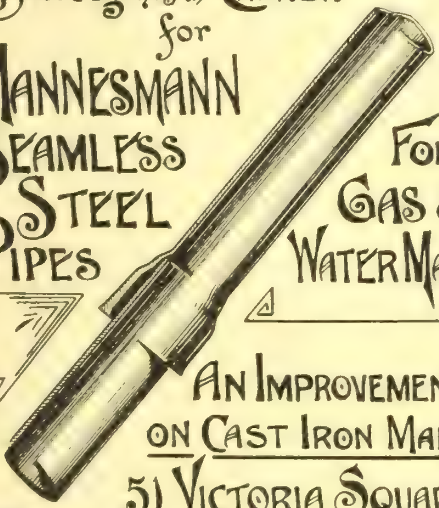
→ ESTABLISHED 1861. ←

MUNDERLOH & Co. Ld.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS



AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE,

MONTREAL.

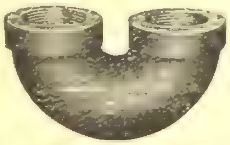
MADE UP TO 40 FEET IN LENGTH.

STRONGER.

CHEAPER.

RELIABLE

Semi Steel Fittings


RETURN BEND

PIPEHANGES

Y BRANCH

REDUCER

HEADER

CROSS

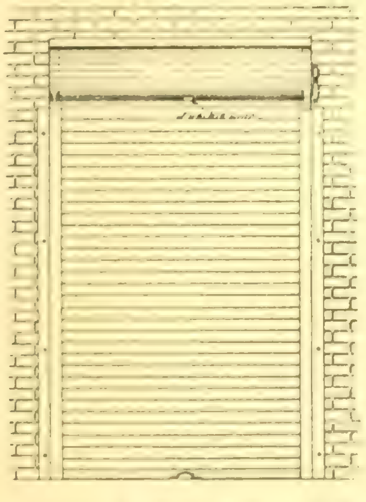
A fitting for every purpose
TRY THEM

Standard Fitting & Valve Co.

Limited
GUELPH - ONTARIO

The Most Economical Door Made as Regards Space

Our Rolling Steel Doors take up but one foot above the opening and 2½ inches on either side. They have **proved themselves in actual fires** in Canadian Cities. Can be left in any position and will close of themselves when struck by fire. They stand any amount of wear and tear and are very easily operated. — Specify our Patented Rolling Steel Door for any opening where a Fireproof Door is needed and space is limited.



Experts in Fireproof Windows and Doors.

A. B. ORMSBY, Limited

Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
Anglin, S.	118
Batts Limited	120
DeLaplante, Ltd	110
Eaton & Sons, J. R.	110
Georgian Bay Shook Mills	110
Rhodes Curry & Co	
Sanitary Floor Co	118
Siemon Bros.	119
[illegible] Co	109
Woodstock Lumber Co.	118

Metal Lath

Galt Art Metal	111
Metallic Roofing Co	93
Noble C W	111
Pedlar People	121

Meters

Hopkins & Co., F. H.	120
Neptune Meter Co	94

Paving and Paving Materials

Bessemer Limestone Co.	12
Dominion Carbolineum Works	13
National Paving Brick Association	31
Mack Manufacturing Co.	11
Metropolitan Paving Brick Co.	17
Ontario Asphalt Block Co.	118
Silica Barytic Stone Co. of Ontario	117

Plaster

Albert Mfg. Co.	
Britnell & Co	109

Pipe

Canadian Pipe Co	104
Dominion Wood Pipe Co	107
Gartshore-Thomson Pipe Co.	104
Munderloh & Co	5
Municipal Construction Co	109
National Iron Works	105
Pacific Coast Pipe Co	1

Paints and Varnishes

Cabot, Samuel, Inc.	113
Glidden Varnish Co	32
International Varnish Co.	112
Paterson Mfg. Co.	122

Power Engines

	Page
Inglis Co., John	36

Pile Driving

Lincoln Construction Co.	113

Pumps and Pumping Machinery

Beatty & Sons, M	110
Goulds Pump Co	119
Hopkins & Co., F. H.	120
Inglis Co., John	36
Leonard & Sons, E	113
Martin Steam Pump Co.	107
McDougall Caledonian Iron Works, John	35
Mussens Limited	30
Ontario Wind Engine & Pump Co.	115
Smart-Turner Machine Co.	1
Waterous Engine Works Co	

Roofing Materials

Barrett Mfg. Co	122
Galt Art Metal Co.	111
Metallic Roofing Co	95
Metal Shingle & Siding Co.	20
Noble, Clarence W	111
Rogers Supply Co	43
Roofers Supply Co	105

Railway Supplies

Gartshore, John J	117
Hopkins & Co., F. H.	120
Mussens Limited	44

Road Machinery

American Road Machinery Co.	108
Case Threshing Machine Co.	108
Climax Road Machine Co	108
Morrison & Co., T. A	116
Mussens Limited	44

Sewer Pipe

American Sewer Pipe Co	94
Britnell & Co	109
Canada Iron Corporation	105
Dominion Sewer Pipe Co	96
Gartshore-Thomson Pipe Co.	104
Hamilton & Toronto Sewer Pipe Co.	97
Lock Joint Pipe Co	106
National Iron Works	105
Ontario Sewer Pipe Co	99
Rogers Supply Co	43
Standard Drain Pipe Co	98

Sand

	Page
Rogers Supply Co	43

Stone

Britnell & Co	119
Christie, Henderson & Co.	34
Consolidated Stone Co	34
Contractors' Supply Co	109
Corinthian Stone Co	34
Crushed Stone, Limited	113
Doolittle & Wilcox	105
Hagersville Contracting Co.	5
Laurentian Granite Co	116
Maloney John	115
Morrison & Co., T. A.	116
Myers, Oakley	113
Rogers Supply Co	43
Roman Stone Co	34
Sackville Freestone Co.	43

Submarine Driver

Roulean, Joseph N.	117

Structural Iron and Steel

Buffalo Steel Co	
Dominion Bridge Co	114
Hamilton Iron & Steel Co	104
MacKinnon Holmes & Co.	115
Pennsylvania Steel Co	114
Phoenix Bridge & Iron Works	115
Reid & Brown	116
Salter, W. H	115

Shovels (Steam)

Beatty & Sons, M.	110
Canada Foundry Co	34
Hopkins & Co., F. H	120
Mussens Limited	44

Shingle Stains

Cabot, Samuel, Inc	113

Slate

Roofers Supply Co	105

Steel Shingles and Ceilings

Galt Art Metal Co	111

Smoke Stacks

	page
Leonard & Son, E	113

Safes and Vaults

Taylor, J & J	

Sheathing Papers

Cabot, Samuel, Inc	113

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	113

Tanks and Stand Pipes

Inglis, John	36
Jenckes Machine Co	2
Leonard & Sons, E	113
Marsh & Henthorn	95
McDougall Caledonian Iron Works	35
Ontario Wind Engine & Pump Co.	115

Valves

Canada Iron Corporation	105
Gartshore-Thomson Pipe Co.	104
Kerr Engine Co	7
Marsh & Co, Jas	110
Standard Fitting & Valve Co	5

Ventilating System

Gardiner & Gaskill	35

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	113

Wire Rope

Dominion Wire Rope Co	120
Greening Wire Co., B.	118
Smith, Thos. & Wm	

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	110

Water Wheels

Canadian Boving Co	2

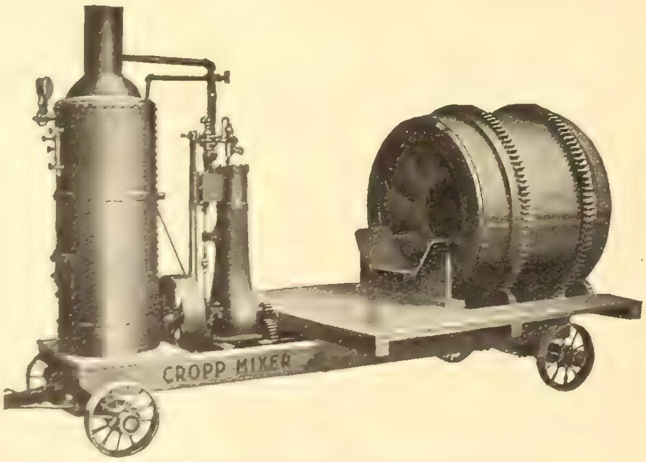
Water Power Plant

Escher Wyss & Co	

The Low Charging

CROPP MIXER

The only Mixer that will not spill when overcharged



Low charge and high discharge covered by Patent 947196.

These are two very important factors in a mixer.

The **Cropp Mixer** does not have any hoisting machinery to get out of order and it is always on the job doing the work. All working parts are protected and made exceptionally strong. Our charging platform is only 24 inches high. This represents time and time represents dollars.

Either Steam or Gasoline Engine

The many good features of this remarkable mixer are set forth in our catalog. Send for one, stating requirements. **Our prices will interest you.**

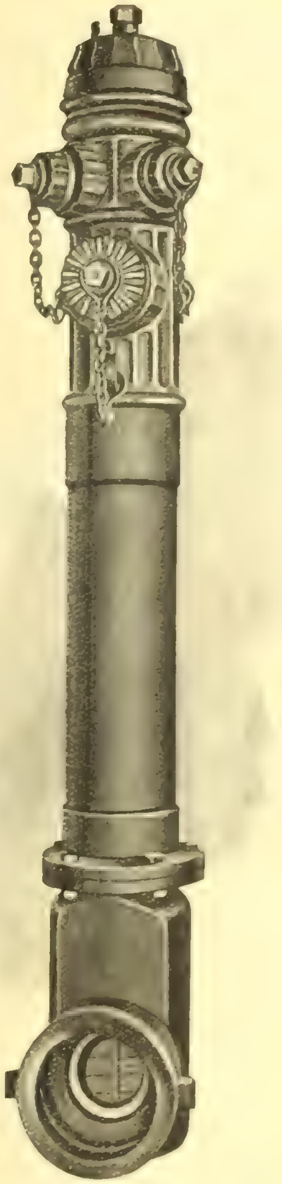
Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

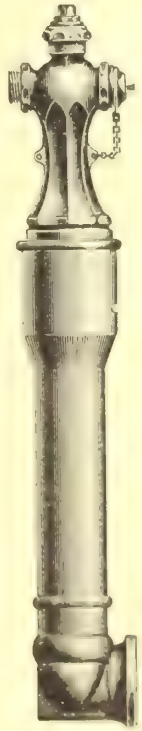
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

KERR

Valves and Hydrants



are used by cities and towns in every part of the Dominion. They have a reputation built up by years of long and satisfactory service. YOUR municipality should specify "KERR" for all waterworks' contracts.



Unsurpassed in
Workmanship
Design
Material
Efficiency

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Milton Pressed Brick Co.

Limited

Montreal Office
204 St. James Street

Head Office and Works
Milton, Ont.

Toronto Office
75 Yonge Street

Manufacturers of strictly high grade

Pressed Brick

that for years have represented the standard of excellence in pressed brick

---

Just a Few Reasons Why Our Brick are the Best:

In the first place Milton shale is recognized as perfect material for pressed brick, fine in texture and beautiful in color. This together with our long experience (over 20 years), the most up-to-date machinery, down draft kilns, expert burners and setters enables us to make a brick that is clean cut, solid, uniform in size, and perfect every way.

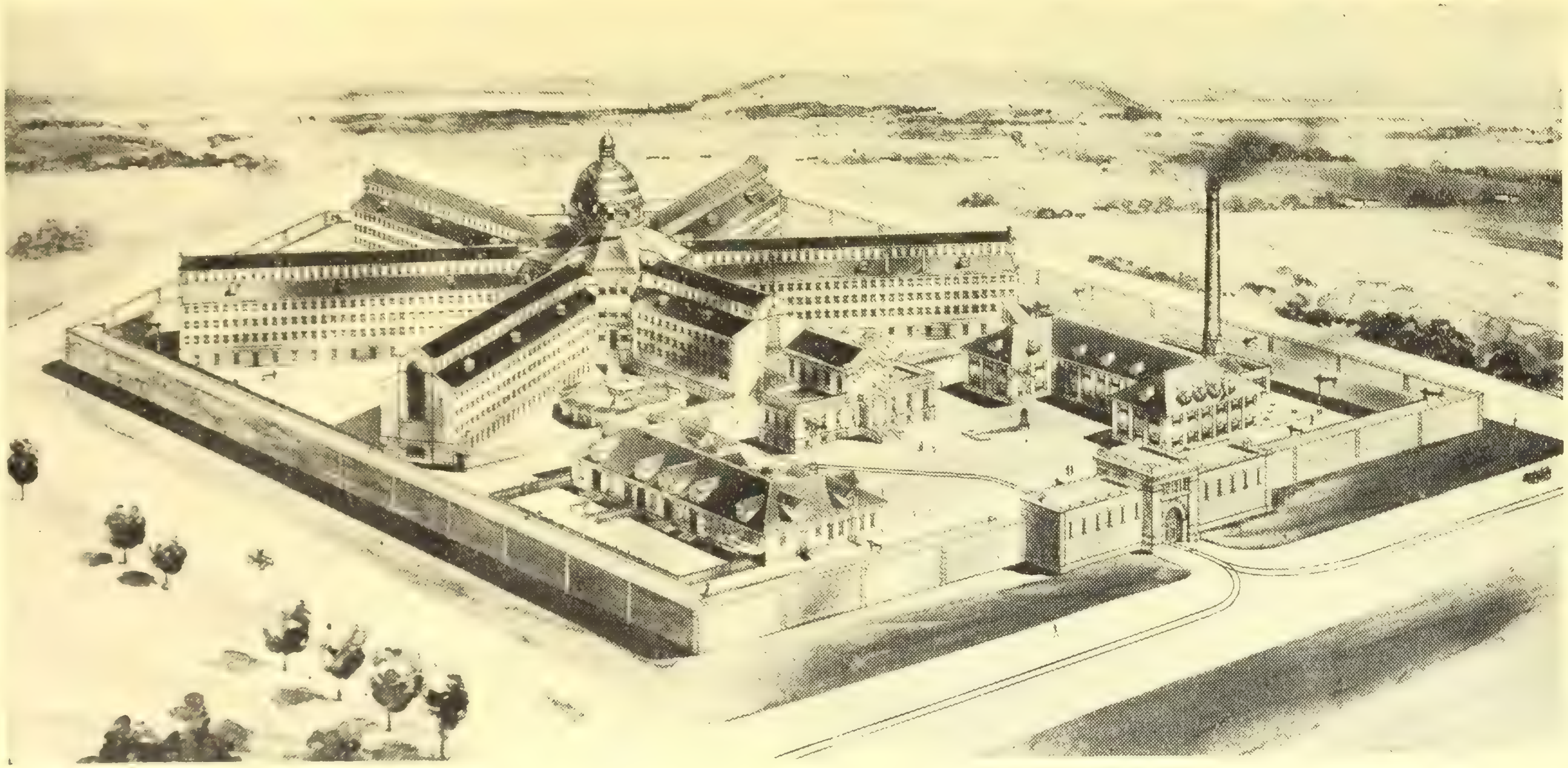
Have you seen our buff brick? You cannot afford to ignore them. Of late years they have become the most popular brick on the market, and justly so. On account of their many beautiful shades they make bright, cheerful homes and are also in demand for apartments and office buildings.

Our standard red brick is known for its clear uniform color and is always in demand.

We will be pleased to forward samples prepaid to your address.

NEW MONTREAL JAIL AT BORDEAUX, P. Q.

Marchand, Haskell & Brassard, Architects



The largest fireproof construction ever built in the Dominion of Canada, and the most modern in every respect.
Acres of floor arching, partitions, furring, roof slabs, etc., etc.
All of **POROUS TERRA COTTA** manufactured and supplied by

The Montreal Terra Cotta Lumber Co.

Works: Maisonneuve, P. Q. - Office: 26 Board of Trade Building

Right Here in Canada

Architects and Contractors can obtain marble with all the richness and depth of color that is to be found in the finest imported product.

Missisquoi Marble

is quarried in six distinct varieties which afford excellent opportunities for following out beautiful color schemes.

Light Grey	**Cream with Green Vein**
Dark Grey	**Cream with Mottled Green**
Green Grey	**Cloudy Green and Pink**

The Missisquoi Marble Co., Limited

Philipsburg, Quebec **Coristine Building, Montreal**

District Sales Agents :

DAVID McGILL, MONTREAL, QUE.	C. N. BARCLAY, WINNIPEG, MAN.
EADIE-DOUGLAS CO., TORONTO, ONT.	W. N. O'NEIL & CO., VANCOUVER, B.C.

GENERAL CONTRACTORS' SUPPLY CO., HALIFAX.

It Pays to Use the Best

Mack Vitrified Brick or Block are Used all over the world

Mack Brick and Block have been proved by most thorough tests and continued use to be equal if not superior to all other brick or block on the market for paving purposes, entitling them to rank as follows:

First as to Cheapness of Construction
First as to Cheapness of Maintenance
First as to Freedom from Decay
Equal to Ashphalt as to Water-tight Cover
Equal to Ashphalt as to Ease of Traction
First as to Healthfulness
First as to Facility of Repair
First as to Foothold for Horses
Equal to Ashphalt as to Freedom from Noise
Equal to Ashphalt as to Freedom from Dust
Next to Granite as to Durability under Traffic

No Contract too large no order too small

Annual Capacity 50,000,000

Mack Manufacturing Co.

General Offices; Land Title Building, PHILADELPHIA, PENN.
Works:—NEW CUMBELAND, W. VA.

Bessemer Vitrified Paving Block

The Permanent Pavement

Durable - Smooth - Sanitary - Economical

A properly constructed Bessemer Block city pavement will endure at least Twenty years under heavy traffic with practically no maintenance expense.

When you compare the long life of this pavement with its low first cost the economy of the proposition is apparent

Two Large Modern Factories
Annual Capacity
60,000,000
Ten Pound Block

Illustrated catalogue and samples forwarded prepaid upon request. Correspondence with municipal civil engineers especially solicited.

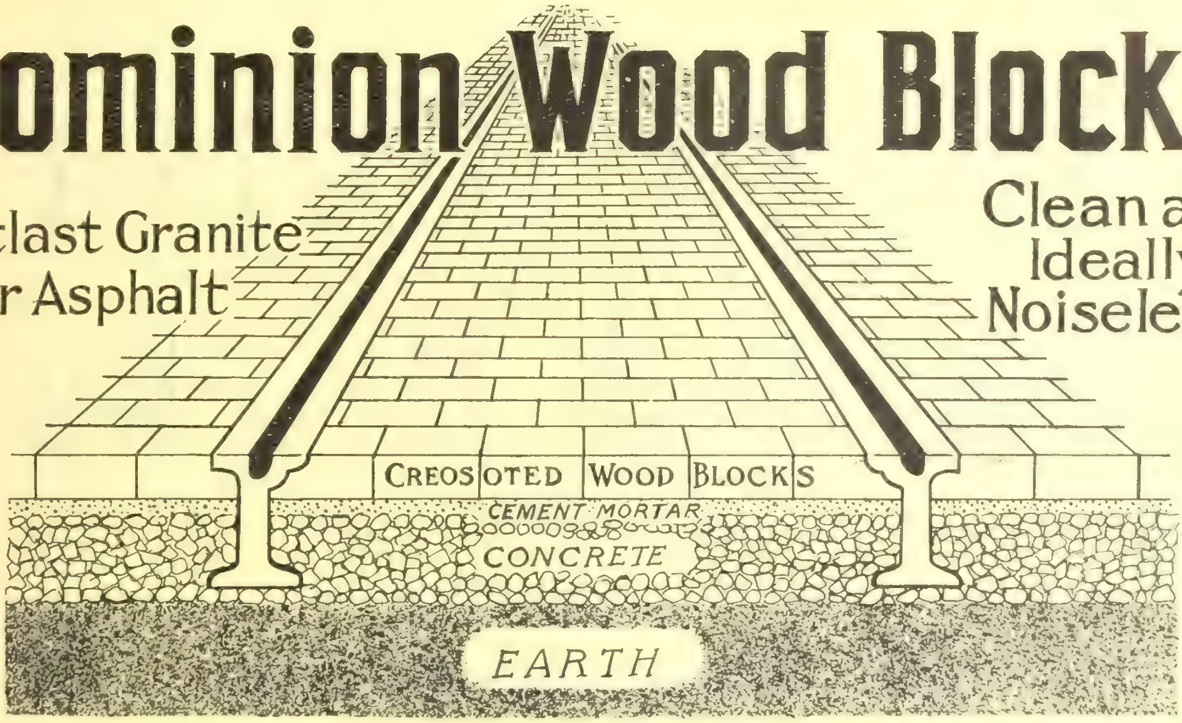
Among the largest cities in which Bessemer Block have been used are :—New York, Chicago, Pittsburg, Cleveland, Buffalo, Toledo and Detroit.

Manufacturers :

Bessemer Limestone Co.

Youngstown, Ohio, U.S.A.

Dominion Wood Blocks



Outlast Granite or Asphalt

Clean and Ideally Noiseless

THE IDEAL PAVEMENT

Dominion Creosoted Wood Blocks are recognized as the ideal material for pavement construction.

THE REASON WHY

They are not affected by extremes of temperature

They are easily cleaned.

Can be laid by unskilled labor with ordinary tools.

Parts of the pavement may easily be taken up in order to effect water, sewer and gas connections and relaid so perfectly that the junctions cannot be discerned.

Dominion Creosoted Wood Blocks are made from close grained Douglas Fir of first growth, the best the market affords. There is no better material for the purpose than Douglas Fir; if there were, we would use it.

Dominion Carbolineum Works LIMITED

Vancouver, B.C.

Terra Cotta Pressed Bricks

These are one of the strongest and most uniform bricks produced in Canada.

Owing to the peculiar kind of shale from which this brick is made, the rich and pleasing colors are rendered permanent.

We have a very complete and modern plant situated at Terra Cotta, Ont., on the Allandale branch of the G. T. R.

With excellent shipping facilities we are able to forward all orders without delay.

Terra Cotta Pressed Brick Co.

Works:
Terra Cotta, Ont.

Head Office:
37 Yonge St., Toronto

Architectural Terra Cotta and Pressed Brick

We are the only firm in Canada who manufacture Architectural Terra Cotta.

WHY

should you go out of your own country to obtain this product when you can get it here?

We also make a specialty of high-class Brick Mantels.

Red Brick
Buff Brick
Factory Brick

High Grade Pressed Brick made in all colors

Our Shipping Facilities are of the best, and our service!—well, it simply can't be beaten.

Toronto Pressed Brick & Terra Cotta Works
Milton, Ontario
C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James Street.
Toronto Agent: J. D. MacDONELL, 19 Yonge Street Arcade.

For

Fire and Furnace Purposes

there are no better bricks than

GLENBOIG or **GARTCOSH**

BRANDS

For Building Purposes

Where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal Dealers

Maker's Selling Agent **Alexander Gibb** 13 St. John St. MONTREAL

Silicate Brick

The largest, highest and best buildings in the Capital are constructed with Silicate Brick.

Silicate Brick can be used to great advantage for schools, churches, fire halls, warehouses, in fact wherever a nice white wall is required, where white Silicate Brick is used no plaster is needed.

Silicate Brick can be used for foundations and sewers. They are less affected by frost or water than any other brick.

For further iuformation apply

Silicate Brick Co.

of Ottawa, Limited

J. A. Bullman, Manager

Office Phone 3137
Residence Phone 5291

durance.

"You have in Ohio the Canton shales. These make the very best paving bricks in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material, and are trying to find something as good in their countries. They are ning up

What an Expert Engineer Said:

Extract from address of J. W. Howard, C.E.E.M. of New York, N.Y., about street pavements to the Associated Organization at meeting of the Business Men's Club.

From the "Enquirer" Cincinnati, O., U.S.A. March 30, 1910.

"Best Paving Block Made"

Meet all Tests

Prompt Regular Shipments

Daily Capacity

500,000

What an Experienced Contractor Said:

From the "Gazette" Richwood, O., U.S.A.

An opinion based on 25 years experience as a street paving contractor.

meant what he said.

In speaking of the beautiful Metropolitan blocks now piled on either side of Franklin street, the contractor said, "they are the finest and most uniform blocks I ever handled and I have been in the paving business for over twenty-five years. They are evenly burned, uniform in color and the smoothest I ever saw." The Cleveland

THE METROPOLITAN PAVING BRICK CO.

CANTON, OHIO, U. S. A.

Hamilton Red

PLANT OF
THE HAMILTON-PRESSED-BRICK-CO
HAMILTON-ONT.

OUR PRODUCT

Made from Red Shale; smooth surface, well defined edges and corners; always has a bright, fresh appearance. Immune to time and erosion, minimum absorption. "**HAMILTON**" stamped on every brick.

The Hamilton Pressed

Spectator Building - - - - -

Phones:—Factory 199

Pressed Brick

Residence of Orville Quigley, Esq., Hamilton, Canada. Herbert H. New, Architect,

OUR FACILITIES

Unexcelled shipping facilities. Connections with T.H.B., C.P.R., G.T.R., M.C.R. Annual capacity 4,000,000 to 5,000,000. Burned in down draft kilns, capacity 140,000 each. Inexhaustible deposits of ferric-oxide shale.

Brick Company, Limited

- - - - - - Hamilton, Ontario

Office 2931, Residence 345

Silica Pressed Bricks

A Superior Building Material

Unexcelled in Quality and Appearance as well as in Economy
Our product is specified by prominent architects for the most important classes of work

WE MANUFACTURE THESE

In the NATURAL COLOR in RED and in BUFF all colors being permanent

Buildings of Borden's Condensed Milk Co., Tilsonburg. Our Natural Color Silica Bricks used

Any of these three colors are unsurpassed for any class of building, making excellent face brick.

For the better classes of work such as Business blocks, Schools. Residences, etc., a more artistic and beautiful appearance can perhaps be had by using contrast in mortar joints—the natural color with black joints, the red with white or black joints, the buff with white or red joints. Also for residences a beautiful effect is had in the white and buff bricks by using a contrast in the base courses and by tinting the roofs to harmonize.

Our bricks have been used in large school buildings for facing the interior corridors and basement walls, the white and buff used together in panel effect making beautiful work.

The natural color Silica bricks are the only ones to use for interior of warehouses and factories where daylight is valuable, they do away with the dark spaces and eliminate whitewashing.

We are able to make prompt Shipments over all railroads

Before Specifying or Building get our Prices and Samples

New Warehouses of the Gould, Shapely and Muir Co., Brantford. Our Natural Color Silica Bricks used

The SCHULTZ BROS. CO., Limited BRANTFORD

Manufacturers of **Full Line of Builder's Supplies—Lumber Merchants—Bonding Contractors**

——Established 40 Years——

Port Credit Brick

is made from pure shale (not clay) by skilled workmen with modern equipment, and in one of the most up-to-date plants in the Dominion.

It possesses a rich red color, great strength and minimum absorption.

Repressed and Wire Cut Brick
Pressed and Common Brick

Our output last year was 50,000,000 bricks and we have since increased our capacity.

The shale from which Port Credit Brick is made is not only rich in iron oxide and free from lime, but it has an extremely low percentage of sulphurous oxide, thus preventing the so-called soda often found on red pressed brick.

Make your contract a success by using "Port Credit."

We also manufacture a very hard vitrified sewer brick.

The bricks used in the construction of the trunk sewer in Toronto are our bricks.

Port Credit Brick Company
Limited

Home Bank Building - - Toronto
Works: Port Credit - - Ontario

If You Want Good BRICK!

Let Us Supply You

Clayburn Co., Ltd.

Successors to The Vancouver Fireclay Co., Ltd.

Manufacturers of

Pressed Facing Brick

Red, Buff, Grey, Mottled—natural colors, extreme in hardness, low in absorption.

Fire Brick, Fire Clay

for lining Coke Ovens, Furnaces, Retorts, Mill, Refuse Burners, etc. Both square and special shape brick, as required, Fire Clay in sacks.

Building Brick

made from superior clays in rich red and white. Smooth, even make, unexcelled weather-resisting qualities.

Paving Brick

will endure for a lifetime under the heaviest kind of traffic and they offer a good surface. Cheapest by far in the long run.

Fireproofing Blocks

endorsed by leading Architects and strongly recommended by Insurance Companies.

Agricultural Tile

smooth and true in bore, tough, but not brittle. Made from our high grade clays—a superior article at a low price. Sizes 3 to 8 inches.

Works at CLAYBURN, B. C.

Head Office:
Imperial Bldg. Seymour St. - VANCOUVER, B. C.

Evans Coleman & Evans

General Selling Agents - VANCOUVER, B. C.

Preliminary Notice to Architects
Contractors and Builders

**The Anvil Island
Brick Co., Limited**

will shortly have their up-to-date

Pressed Brick

Plant in operation, producing
only a first-class Red Brick

The Company hope for patronage and support
in this Local Industry.

Works at Anvil Island, Howe Sound, B.C.

324 Seymour Street - Vancouver, B.C.

FREDERICK LANCE, President
M. B. TAYLOR, Manager

National Fire Proofing Company

of Canada Limited

Plant No. 1, Hamilton, Ont. **Office, Traders Bank Bldg., TORONTO, ONT.**

DIRECTORATE :

W. D. Henry, President. (President National Fire Proofing Company of Pittsburg, Pa.)
Samuel Barker, M.P., Vice-President. (President United Empire Bank, Hamilton, Ont.)
Charles Magee. (President Union Trust Company, Toronto, Ont.)
E. E. A. DuVernet, K.C. (DuVernet, Raymond, Jones, Ross & Ardagh, Toronto, Ont.)
Chas. L. Weisner, General Manager, Toronto, Ont.

Manufacturers of

Terra Cotta Hollow Tile

Contractors for

Fire Proof Construction in Hollow Tile and Reinforced Concrete

Announcement

This company is organized, under a charter issued by the Dominion of Canada, for the purpose of manufacturing Hollow Tile for Fireproofing and other structural uses, and also for undertaking contracts for Fireproof Construction both in Hollow Tile and Reinforced Concrete.

After exhaustive tests of various clay beds throughout Ontario, we have purchased a large tract of clay land near Hamilton, Ont., where we have an ample area of very satisfactory clay with unexcelled shipping facilities.

Factory No. 1 (located at this plant) is designed for the manufacture of Hollow Tile Floor Arching of all types, Beam and Column Covering, Partition Tile, Wall Furring, etc., etc. This factory is being equipped with the best machinery obtainable and will have ample drying and burning facilities, enabling us to produce a full line of high-grade Hollow Tile that will meet the rapidly growing demand of the architects and structural engineers of Canada for a satisfactory line of Terra-Cotta Fireproofing, etc., made in accordance with modern designs and conforming to modern specifications.

Our organization provides for the preparation of details for the application of our materials and for furnishing preliminary cost data; we are prepared to tender direct, or as sub-contractors, for Fireproof Construction in Hollow Tile or in Reinforced Concrete.

The publications of the National Fireproofing Company of Pittsburg, Pa., on Standard Terra-Cotta Fireproofing, Long Span Fireproof Construction and on Fireproof Houses of Hollow Tile, will be furnished from this office on request.

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited

Phone 423 and 2457

HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING
AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No	JOBS	1st Quarter	2nd Quarter
104	Public Office Bldgs, Banks, Libraries, Halls and Theatres	3,540,991	[illegible]
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	[illegible]
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	[illegible]
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	[illegible]
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	[illegible]
70	Pumping Stations and Power Houses	1,779,271	[illegible]
25	Natatorium Swimming Pools and Comfort Stations	281,682	[illegible]
41	Hospitals, Asylums, Homes	1,062,571	[illegible]
37	Private Stables	460,320	[illegible]
32	Railroad Stations and Subways	[illegible]	[illegible]
56	Mills and Factories	[illegible]	[illegible]
17	Police Stations and Fire Houses	208,664	[illegible]
656	Total 1st	[illegible]	4,660,766
	Total 2nd	[illegible]	
	Total 1st and 2nd	[illegible]	
61	Bake Oven Jobs	101,694	
717		17,502,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.

Metropolitan Building, NEW YORK.
Local Agents in Montreal, Toronto and Ottawa.

Established 1888 ANNUAL CAPACITY 500,000 **Capital $500,000**

New Jersey Terra Cotta Co.

Singer Building, NEW YORK

Manufacturers Highest Grade of

Architectural Terra Cotta

High Class Agents desired for the Dominion of Canada

Send Plans for Estimates

Renfrew Lime

Brick, Drain Tile, or Weeping Tile

Shipped Promptly

to any part of the world

Renfrew Lime is recognized by builders and contractors as the best building lime on the market.

Reasons Why

It takes more sand.

It trowels easily, and mortar requires less tempering on the board. This enables bricklayers to do more work.

The saving pays for the lime.

We Manufacture

High-Grade Lime, Brick, Drain Tile

Send us your next order.

Phone 49

Our Eganville Lime, also a high-grade lime, is used principally in the manufacture of

Carbide

Chemical Products

Sand Lime Brick

It is also used for building purposes.

Jamieson Lime Co.

Renfrew, - Ont.

Don Valley Bricks

were selected for Mr. J. C. Eaton's palatial residence in competition with the principal brick manufacturers of the world.

New Mansion Being Erected for Mr. J. C. Eaton, Toronto.

Don Valley Porous Terra Cotta Fire-proofing, Foundation Bricks, Facing Bricks and Enamelled Bricks exclusively were used in this structure.

Don Valley Brick Works

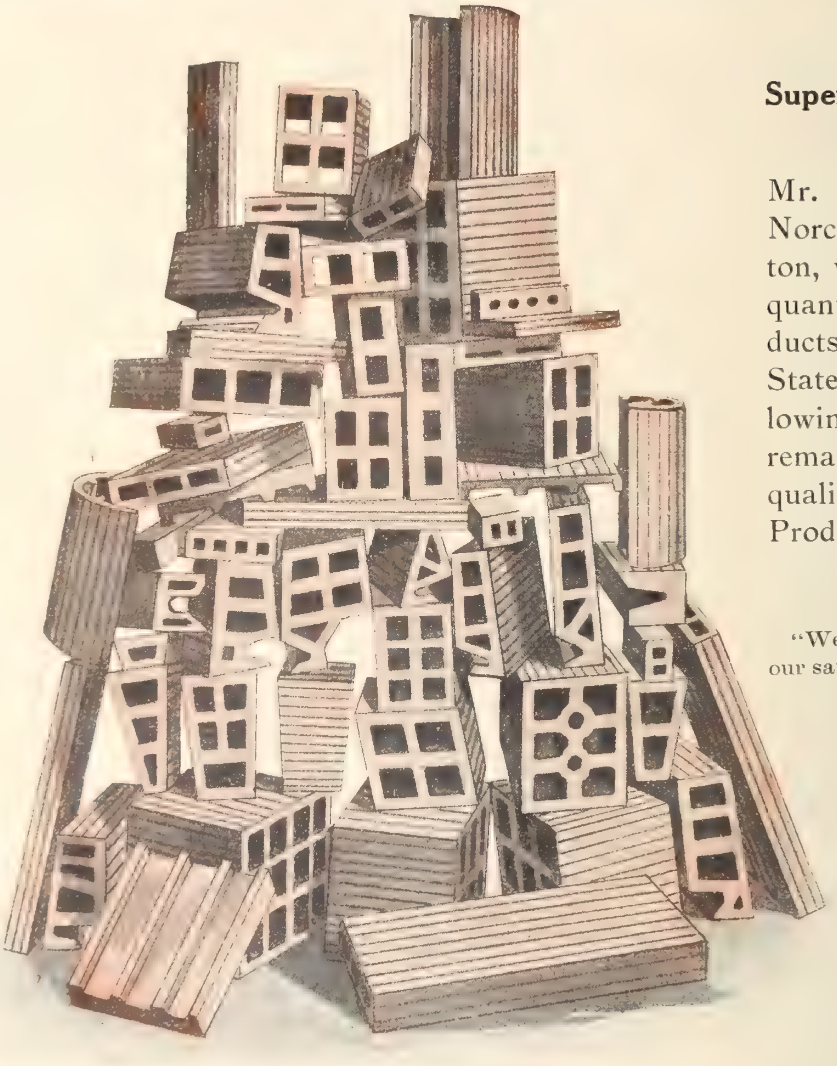
TORONTO - - - - CANADA

The Superiority of Don Va

is Demonstrated by the Experience of Thos

Mr. C. Lawson Pierson of the Engineering Contracting Co., who was formerly connected with one of the largest Contractors for Fireproof Buildings in the United States, says of Don Valley Terra Cotta Fireproofing:

"We find that it is the best quality Porous Terra Cotta Fireproofing we have ever erected, it being burnt thoroughly and heavier than the American manufacture. this fact alone making it stronger and better for the fireproofing of steel columns and girders. It has less waste than the kind we have heretofore used."



Superior to Any W
Ever Used

Mr. C. E. Palmer c Norcross Bros., Bos ton, who has used vas quantities of clay prc ducts in the Unite States, makes the fo lowing complimentar remarks relative to th quality of Don Valle Products:

"We beg to express to yc our satisfaction with the e cellent quality c your product, supplied to us for th Royal Bank Buil ing, and it is wit pleasure we stat that the materia supplied by you ar equal if not superic to any we ever use The 100,000 brick that we have use have proved highl satisfactory."

Superior in Quality and Finish

Messrs. Simpson & Young, Architects, Toronto, have something to say about Quality and Finish of Don Valley Products:

"Your Brick and Terra Cotta has been specified in a large amount of our work and we are pleased to state that we have found your products to be quite superior in quality and finish. Your prompt deliveries are a feature of your generally satisfactory service upon which you are to be especially complimented."

Highest Quality and Best Obtainable

Messrs. Fred Holmes & Sons, Buildin Contractors, Toronto, have something t say about Don Valley Products:

"We also take advantage of this opportunity to e press to you our satisfaction with our dealings with yo during the past season. Not only the efficient servic rendered us in delivery, but we must state that the ma terials supplied us were of the highest quality and by a means the best obtainable."

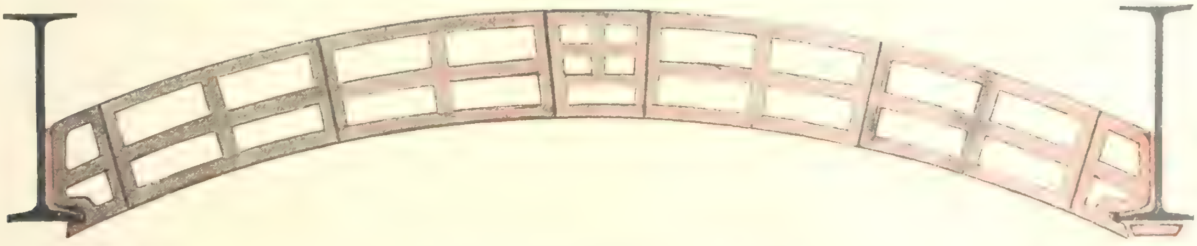
Don Valley Brick Works

Head Office:
36 Toronto St., Toront

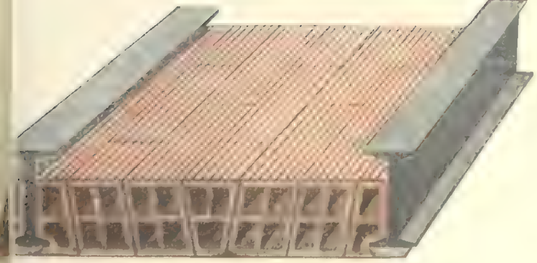
Montreal Agent: DAVID McGILL, 83 Bluery Street.

ey Terra Cotta Fireproofing

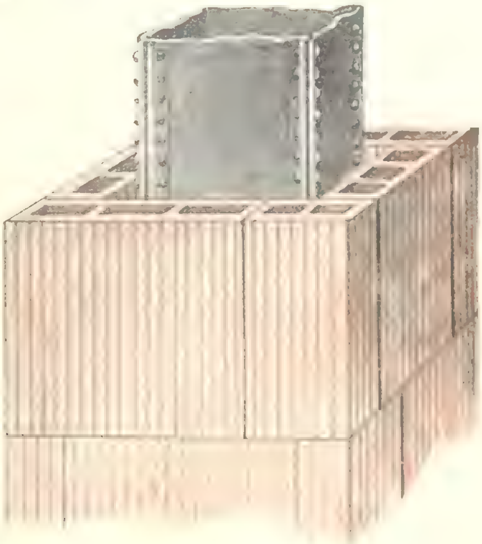
Who Have Also Used Foreign Products



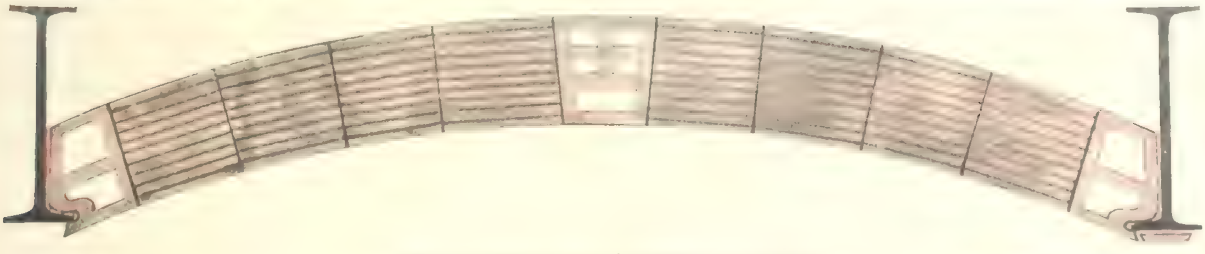
Section Showing Style of Skewbacks and Keys



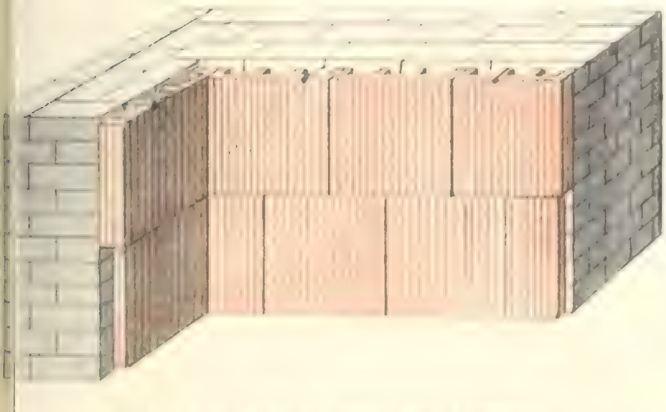
Perspective of Typical Arch



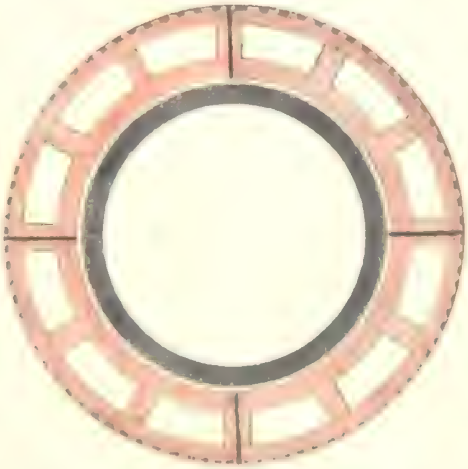
Perspective of Column Fireproofing.



Section Showing Style of Skewbacks and Keys.



[illegible] 8 x 12 x 12, weight per square foot, 8 pounds
12 x 12 x 12, weight per square foot, [illegible] pounds

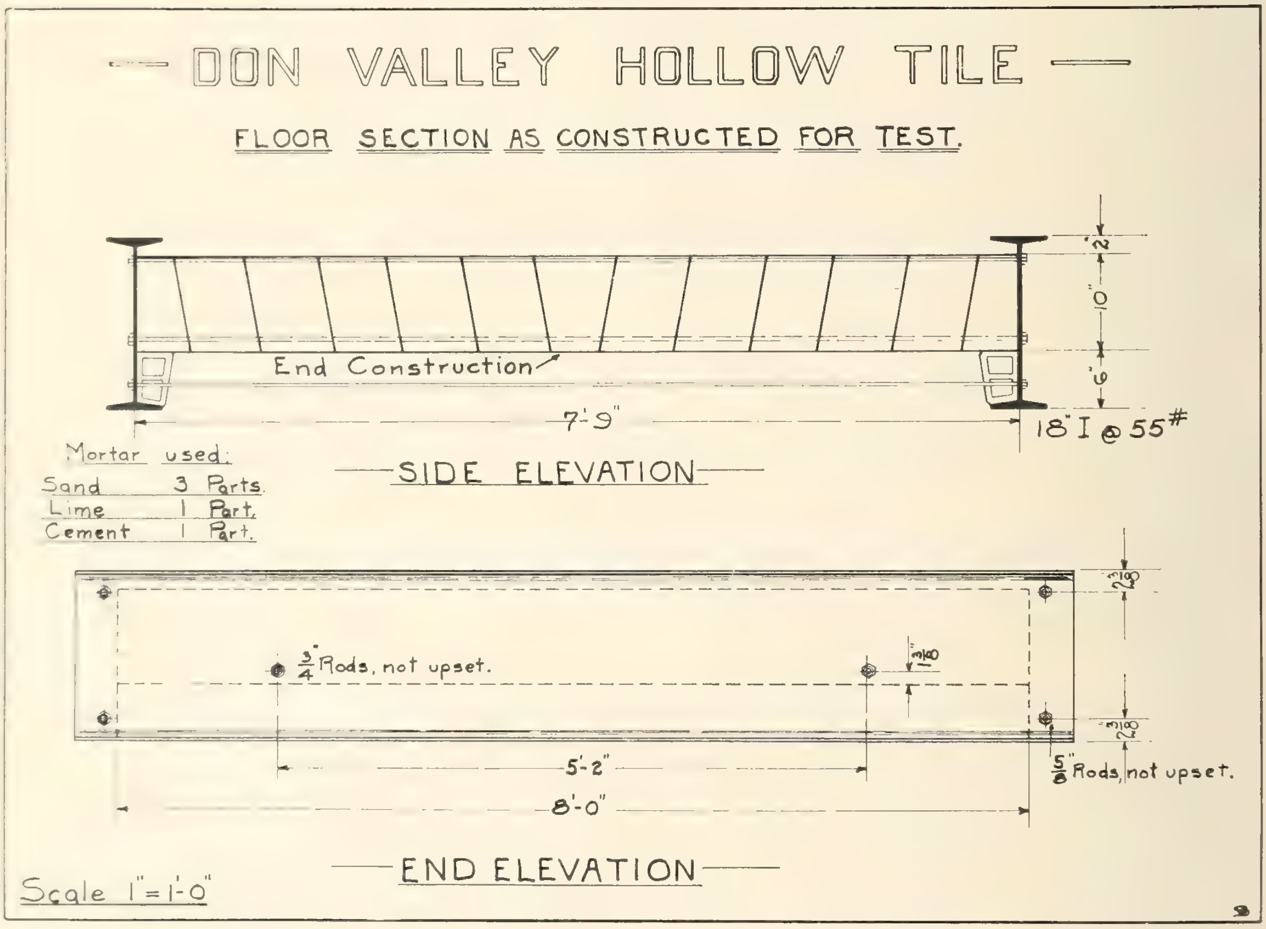


Pipe and Column Covering.

An Extraordinary Test

of Don Valley Porous Terra Cotta Fireproofing by Prof. Peter Gillespie of the School of Practical Science, Toronto University

Loaded to the Roof without any signs of Destruction.



Detailed Drawing of Floor Panel Accompanying Prof. Gillespie's Official Report.

This test was made with the object of establishing Porous Terra Cotta Fireproofing as manufactured by the Don Valley Brick Works as the most efficient and economical method of fireproof construction. The test was conducted under the direction of Prof. Peter Gillespie, Lecturer on the Theory of Construction at Toronto University, and the result as shown in his official Report unquestionably establishes the pre-eminence of Don Valley Porous Terra Cotta Fireproofing.

The panel was an exceptionally large one, being 7 ft. 9 in. by 8 ft., and was designed to carry a load of 200 lbs. to the square foot. It was loaded with bags of cement and clay to the roof until it carried a weight of 546 lbs. to the square foot, at which point no signs of failure could be found. Further loading was made impossible by the roof of the building in which the test was made.

Don Valley Brick Works

HEAD OFFICE: 36 TORONTO ST., TORONTO

Montreal Representative: DAVID McGILL, 206 Merchants Bank Chambers

BEAMSVILLE BRICK & TERRA COTTA CO.

Manufacturers of

Peerless Pressed Brick, Tile and Terra Cotta

in all the standard shapes and colors—of pure shale clay.

Red—Buff—Brown

Our machinery, plant and new down-draft kilns are the best in Canada. Our capacity unlimited and product unexcelled. See our dark **Flashed** Brick.

Write for Samples and Prices.

Head Office and Works **Beamsville, Ont.**

GEORGE CRAIN, Proprietor

W. B. Dickey

General Manager of STEGER BRICK for Canada, the United States and Foreign Countries.

For the purpose of installing factories under the Steger Patent Rights for Canada
Patent Rights for the United States.

J. W. FARRIER, Jr., M. E., C. E.
OF BONHAM, TEXAS

Consulting Engineer.

Plans can be seen at Office,

ROOM 206 COTTON BUILDING

EXHIBITION PLANT
1026 BEACH AVENUE **Vancouver, B.C.**

This is no Experiment

¶ The **properly constructed vitrified brick roadway** is no longer an experiment.

¶ This construction has been demonstrated by time and wear to be **the permanent roadway.**

¶ It does not have to be repaired and renewed. It lasts a lifetime **without cost of maintenance.**

¶ No matter how heavy the traffic or what the climatic condition, the surface will not wear into ruts or holes.

It is a Continuing Cost to Experiment with other Pavements

We will send free our booklet, "The Permanent Roadway" and our illustrated book of specifications

National Paving Brick Manufacturers Association

WILL P. BLAIR, Secretary
Suite 521 Board of Trade INDIANAPOLIS, IND., U. S. A.

Sydney Pressed Brick Co., Limited

SYDNEY, NOVA SCOTIA

High-Class

Pressed Bricks

Made from Blast Furnace Slag

Accurate in shape and dimensions
Attractive in colour
Will not only stand extremes of climate but will improve by exposure
Very high fire-resisting property
Mortar adheres to them with great strength

The Northwestern Terra Cotta Co.

Manufacturers of

The Best Architectural Terra Cotta in the World

Main Office and Works
2525 Clybourn Avenue, - CHICAGO
Branch Office: 1415 Railway Exchange.

Wire-Cut-Lug Paving Bricks and Blocks

Manufactured under the Dunn Patents, are now specified in a large number of important American and Canadian towns and cities.

This improved paving block is manufactured with the Dunn Reciprocating Automatic Cutter, which makes blocks with square or round edges, grooves in the ends, brand on one end, and with **WIRE CUT LUGS. NO REPRESSING.**

Patented in Canada, United States, England and Mexico.

Ask for List of Manufacturers Making Wire-Cut-Lug Blocks.

The Dunn Wire-Cut-Lug Brick Co.

Conneaut, - . Ohio

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

**Reinforced
Concrete
Construction**

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.
Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone Company, Guelph

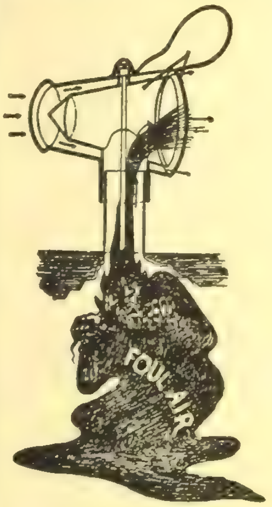
from the hardest substances available

Write the

Corinthian Stone Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

AUTOFORCE VENTILATING SYSTEM



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

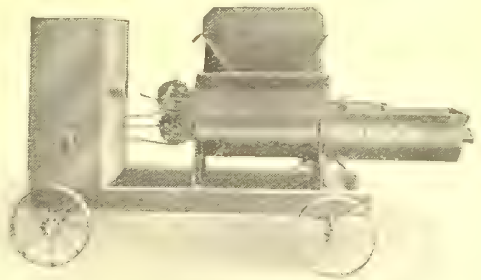
THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

London Automatic Batch Concrete Mixers



Made in two sizes

No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money
- On the first cost of machine
- On cost of operation
- On cost of mixing concrete

OUR AUTOMATIC MIXERS do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired

We also manufacture a STANDARD DRUM BATCH MIXER in three szes, one-third yard, one-half yard and one yard. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

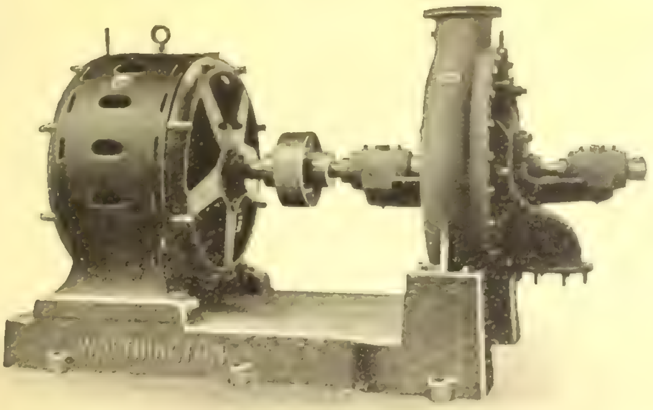
Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER, WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

SEND FOR DESCRIPTIVE LITERATURE

WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

Heavy Plate Work

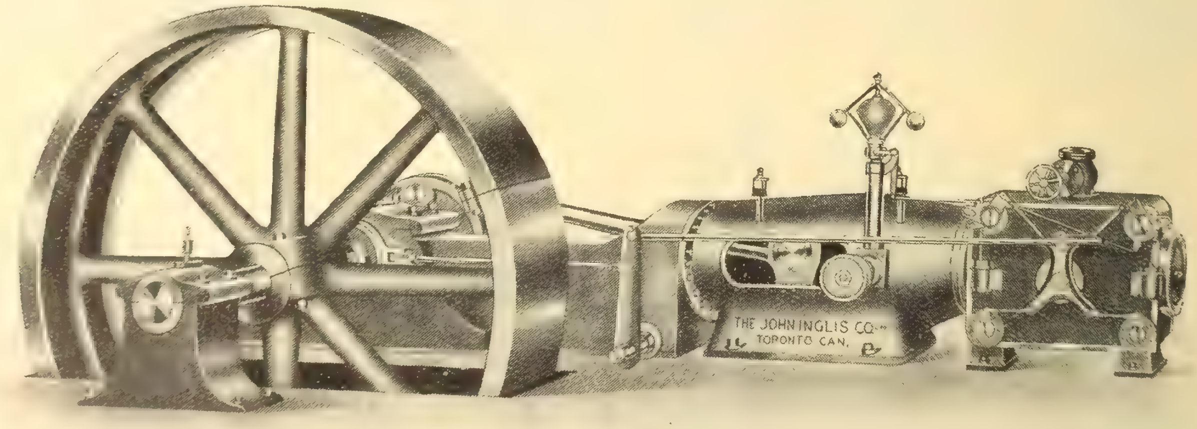
We Manufacture and Erect:

- Stand Pipes
- Penstocks
- Water Tanks
- Dryers
- Fertilizers

100,000 GALLON WATER TANK,
built and erected by us for the Michigan Central Railway at Waterford, Ont.

- Blast Furnaces
- Flumes
- Smoke Stacks
- Special Machinery
- Plate Work of all kinds

"INGLIS" Corliss Engines built for a purpose, to last a life time


THE JOHN INGLIS CO.
TORONTO CAN.

Every Engine guaranteed to do just as represented.
Write us for particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited
14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.

A by-law will be submitted to the ratepayers on December 20th to raise a loan of $50,000 for the purpose of providing for the cost of improvements and extentions to the Brandon water works, etc.

Fort William, Ont.

The ratepayers will vote on the $61,000 water by-law.

Kincardine, Ont.

The ratepayers will vote on a by-law to issue $7,000 sewer debentures.

North Vancouver, B.C.

Tenders addressed to the city clerk will be received until Dec. 12th for supplying a portable, steel fram, jaw rock crusher, with jaw opening of about 11 by 18 inches, and with a capacity of about 20 tons per hour, etc. Further particulars obtained from City Engineer Geo. S. Hanes. Also tenders addressed to above will be received until same date for supplying all materials and constructing storm drain or sewer on Lonsdale avenue from Burrard Inlet to 17th street. Tenderers may bid on salt glazed vitrified clay pipe, semi-wet machine tamped concrete pipe (if immediately removed from the moulds after manufacture), or concrete pipes, made of concrete poured wet into the moulds and allowed to set.

Oak Bay, B.C.

The by-law authorizing tne borrowing of $60,000 for the purpose of purchasing pipe, laying the same, etc., in the system of distribution of water supply, was carried.

Pembroke, Ont.

The date fixed for voting on the waterworks by-law is December 14tn. Noted in last issue.

Penticton, B.C.

Tenders will be received until December 15th for $20,000 30-year 5 per cent. drainage and street improvement debentures. F. L. Lily, secretary treasurer.

Rid ,etown, Ont.

Messrs. L. J. Reycraft, O. K. Watson, Thos. Craig and P. G. Bucknerrough were appointed a committee to ask the town council to have an engineer estimate the cost of a system of waterworks.

St. Catherines, Ont.

The ratepayers will vote on a by-law on January 1st to provide about $150,000 for a new duplicate water main.

Simcoe, Ont.

W. Chipman, C.E., has been instructed by council to prepare a report as to the best methods of sewerage disposal for the town, with estimates.

St. John, N.B.

A. R. C. Clarke and R. S. Lowe tendered for the Marble Cove sewer at $1.35 per lineal foot for rock or earth excavation, total cost $7,500. Referred to the engineer.

Toronto, Ont.

The widening of St. Clair and Danforth avenues has been authorized at a cost of $618,000.

The ratepayers will vote on January 2nd on a by-law to spend $100,000 on good roads; also to spend $803,700 for storm overflow sewer system.

Drainage for the part formerly known as West Toronto is recommended by City Engineer Rust by means of a main sewer south to the intersection of Queen and King streets. Estimated cost, $82,300.

Victoria, B.C.

The council recommends the submitting of a by-law to the ratepayers to provide for the development of Sooke Lake, etc., covering the cost of purchase of lands, etc.

Winnipeg, Man.

Tenders addressed to the Chairman of the Board of Control were received until December 7th for construction of the following sewers: Clifton street, Sargent avenue and Livinia.

AWARDED.

Berlin, Ont.

The Warren Bitulithic Company is stated to have been given a contract for paving certain streets at a cost between $80,000 and $100,000.

Quebec, Que.

The contracts for annual supplies for the Road Department, for $1911-1912, are recommended as follows: Nails, to Chas. A. Parent; unbroken stone, to "La Compagnie de Briques de Quebec, Limitee"; broken stone and special unbroken stone, to "La Compagnie de Briques de Quebec, Limitee"; retaining walls, to Chs. Cote & Co.

Winnipeg, Man.

The board of control let the contract for sewers on Wolfe street from Nairn to Carter avenues and on Carter avenue from Wolfe street to Cameron street, to the city engineer, $38,000.

The contract for cast iron water pipe for the domestic service here was awarded to the Canada Iron Corporation, Limited, Montreal, at $37.50 per ton; and for hydrants to the Canadian Fairbanks Company, Winnipeg, at $37 each. T. McAvity & Sons, of St. John, N.B., will supply the valves, $3,[illegible]

Railroads, Bridges and Wharves

Halifax, N.S.

The Halifax Dry Dock will be extended fifty feet. It was estimated that to extend the dock 200 feet would cost something over $1,000,000, and it is understood that the proposed extension will cost in the vicinity of $400,000. The work will be proceeded with at an early date by the Graving Dock Company independent of city, it is stated.

London, Ont.

The board of works decided to recommend that a by-law be submitted for the bridge of double span type. Noted in last issue.

Kincardine, Ont.

A by-law to issue $2,500 for bridges will be submitted.

Monk's Head, N.S.

Tenders are called by the Public Works Department until December 19th for construction of breakwater here. Plans, etc., at above department. R. C. Desrochers, secretary.

Ottawa, Ont.

The Public Works Department will move the shipyards at present at the foot of the Rideau locks to Victoria Island.

Porcupine, Ont.

The Provincial Government has announced the building of an extension of the T. & N. O. here. The sum of $450,000 is the amount allotted in the Premier's official statement.

Penticton, B.C.

The Kettle Valley Railway will apply for a charter covering the line from Penticton to a point on the international boundary at or near the shore line of Osoyoos lake. Other alternative routes appear on the application.

Regina, Sask.

The city engineer has completed plans for the Broad street subway and submitted them to the city commissioner.

Sault Ste. Marie, Ont.

Tenders addressed to R. S. McCormick, chief engineer, Manitoulin & North Shore Railway, will be received until January 2nd for construction of roadbed and structures of the following sections of the above railway: Crean Hill, etc., to connection with present line at Espanola; Espanola, south to a point at or near Mile 61. Plans at office of the above.

Toronto, Ont.

The ratepayers will be asked to vote on a by-law to expend about $1,039,744 on the Bloor street viaduct on January 2nd.

Vancouver, B.C.

A petition in favor of the proposed bridge connecting Keefer and Dunsmuir streets and the widening of the former was presented. F. L. Murdoff, secretary.

Victoria, B.C.

Tenders were called until December 5th for clearing right-of-way of the Cowichan Lake Branch of the E. & N. Railway from mileage five to end of line at Cowichan Lake. Plans, etc., at office of the divisional engineer of the E. & N. Railway. H. E. Beasley, superintendent.

Winnipeg, Man.

The ratepayers will vote at the December election on the creation of a debt of $190,000 for the reconstruction of the Osborne street bridge.

AWARDED

Victoria, B.C.

The contract for the clearing of the first [illegible] city.

Public Buildings, Churches, Schools, etc.

Brandon, Man.
The ratepayers will be asked to vote on a by-law to expend $50,000 for the building, etc., of schools.

Brantford, Ont.
A proposition to erect a new fire hall and police station on the Waterous property on Darling street and to convert the present post office building into a city hall will be probably submitted to the ratepayers shortly.

Collingwood, Ont.
The board of education will request the city council for a grant of $30,000 to be spent on school enlargement.

Calgary, Alta.
Tenders for all stone and brick work required in erection of Calgary College were called until November 26th. James H. Garden, 512 Eighteenth avenue west, superintendent.

Chilliwack, B.C.
Tenders addressed to R. J. Douglas, secretary Hospital Board, will be received until December 31st for the erection of hospital building. Also tenders for installing hot water heating equipment for the above.

Fort William, Ont.
The ratepayers will vote on a $15,000 police station and court house by-law; also $25,000 isolation hospital by-law.

Fort George, B.C.
It is likely that a site for the new hospital will be selected shortly. The building fund is growing satisfactorily.

Forrester's Falls, Ont.
Tenders addressed to W. S. Coleman, secretary, Forrester's Falls, will be received until December 20th for construction of new school here, S. S. No. 6 Ross. Plans, etc., with above.

Guelph, Ont.
The Salvation Army has purchased the red brick house next to the J. B. Armstrong factory on Quebec street east, where they may erect a big barracks.

It is stated that the campaign to raise funds for the erection of the new Salvation Army barracks is meeting with success. A two-storey building costing $8,000 will be erected now, and later on a permanent residence for the officers.

An option for a site for the proposed Country Club House has been secured. Dr. H. O. Howitt, John Kennedy, G. B. Ryan, F. J. Winlow and others are a committee to report on the matter.

London, Ont.
Tenders for alterations to city hall will be called. Estimated cost about $3,000.

Montreal, Que.
The Montreal post-office is about to be altered and renovated. The work will cost in the neighborhood of $250,000.

The controllers have decided to include in the budget in December an amount for the erection of a new civic building, to house the police department, the Recorder's Court and the new municipal library.

New Westminster, B.C.
High School Inspector has advised the erection of a new high school building.

North Battleford, Sask.
Until December 31st school debentures for $2,500 are called. F. Edwards, secretary-treasurer.

The Provincial Government has closed option on the buildinb site for the asylum. Work will commence early in the spring.

North Vancouver, B.C.
A change is likely to be made in the site of the new fire hall, that on the hill being considered better in view of the modern fire apparatus purchased.

Ottawa, Ont.
The management committee of the public school board has been instructed to report on extra accommodation for Mutchmor street school.

Plans have been completed by Public Works Department for the new plaza, which is to be constructed by covering the space between the Sappers and Dufferin bridges. Estimated cost about $90,000. Tenders will be called about January 1st.

The directors of the general hospital have decided that its enlargement is a necessity. Lt.-Col. J. W. Woods, president. No plans have been prepared.

Peterborough, Ont.
Tenders are being called until December 21st by the Public Works Department, Ottawa, for public buildings here. Plans with Wm. Blackwell, architect, Peterborough and at Department. G. R. Desroches, secretary.

The mayor has been authorized to consult with the Protestant Home Board in regard to the erection of a House of Refuge.

Prince Rupert, B.C.
Tenders addressed to Wm. Henderson, resident architect, will be received until Dec. 19th for erection of quarantine hospital.

Regina, Sask.
Tenders addressed to the city commissioners will be received until Dec. 10th for the erection of fire hall on Scarth St. north. Plans, etc., at office of city engineer.

Sarnia, Ont.
The council granted the request of board of education for grant of $45,000 for school purposes. Noted in last issue.

South Vancouver, B.C.
A building committee of the Robson Memorial Church was appointed to take up the whole matter of the enlargement or rebuilding of the church.

A meeting of the board of health will be called to discuss the project of the erection of isolated hospital.

Sherbrooke, Que.
Mr. J. W. Gregoire, architect, Sherbrooke, is preparing plans for an annex to the St. Charles Borromee Seminary, Sherbrooke. The building will be fireproof, steel construction, terra cotta floors, brick walls, ornamented with stone, and will cost about $75,000.

Toronto, Ont.
At a representative meeting of the different women's societies of this city called to discuss the obtaining or erection of a suitable building as a club house for the different societies represented, a committee formed of Mrs. Falconer, Mrs. Torrington, Mrs. W. Pellatt, and Miss Fitz-Gibbon, is to report on site and preparation of plans.

In Judge Winchester's report re Isolation Hospital, the present building is found entirely inadequate for the number of patients requiring treatment.

The management of Wycliffe College have under consideration the extension of the residence.

The Roman Catholics of Toronto have under consideration the erection of a home for Roman Catholic girls. Archbishop McEvay is interested.

The ratepayers will be asked to vote on a by-law to provide $50,000 for western hospital.

Vancouver, B.C.
The council decided to submit a by-law asking for $967,000 to be spent on the enlargement of school system. Noted in last issue.

A committee composed of Messrs. McCrossan, Pound, Cameron, Stables and Maxwell Smith was appointed by the Vancouver Liberal Association to prepare a report on the project to erect a 15-storey club house as provincial headquarters. Proposed site, Hastings and Howe streets.

Victoria, B.C.
At the first meeting of the Victoria Labor Temple, Limited, the following officers were elected: President, J. C. Watters; C. Sivertz, secretary-treasurer. Steps were taken to secure a new home for labor unions in the city.

Tenders addressed to W. W. Northcott, purchasing agent, were received until December 5th for construction and completion of alterations to Isolation Hospital. Approximate outlay, $20,000.

Vancouver, B.C.
A by-law is being prepared to grant $150,000 for exhibition purposes.

Weston, Ont.
The main building, nurses' cottage, dining room, etc., of the Toronto Free Hospital for Consumptives were destroyed by fire on the 1st inst. Estimated total loss, $100,000.

Welland, Ont.
The congregation of Holy Trinity will undertake to raise funds sufficient to erect a handsome stone structure.

Winnipeg, Man.
In order to secure a building site for school purposes in the future, the board has secured one on McPhillips street. There is a possibility of the school being erected on the site secured in Elmwood on Nairn avenue earlier in the year.

AWARDED.

Aylmer, Ont.
The Dunning Sheet Metal Company have been awarded the contracts for sheet metal and galvanized iron work in the postoffice here.

Koksilah, B.C.
The successful tenderer for the Koksilah school is W. R. Finlay, $1,670.

Montreal, Que.
The contract for erection of art gallery on Sherbrooke street was awarded to Messrs. Fuller & Company, New York. Estimated present expenditure, $300,000. Architects, Messrs. E. & S. Maxwell.

Ottawa, Ont.
The plumbing and steamfitting contract for the new fire station has been awarded to H. A. Knox; the steel work to Dominion Bridge Company. Harry Burgess & Company, general contractors.

St. Thomas, Ont.
The tender of James Williams for plumbing at the new Hiawatha street school was accepted, $145. C. T. Bull's figures were $206.75, and Hamilton & Stott's $199.

Wehtholme, B.C.
J. M. Campbell will build the new Westholme school, $1,700.

Residences

Calgary, Alta.

The architect in charge of the erection of 3-storey brick apartment house (57 apartments) corner of 17th avenue and 8th street west, is Alexander Piere, Calgary. Size (ground floor), 250 x 65 feet 10 inches. Estimated cost, $90,000. Owner, O. G. Devenish, Calgary. Contracts had not been awarded under date of information.

Hamilton, Ont.

The following building permits have been issued: W. J. Rusk, a brick dwelling on Holton avenue, $2,500; Thos. Wren, erection of two brick dwellings on Albert street, between Main and Maple avenue, $3,600; J. Pollard, erection of a brick dwelling corner Locke street and Homewood avenue, $2,500; E. & J. Buscombe, erection of a frame dwelling on Trolley street for T. Hopkins, to cost $2,500; E. & J. Buscombe, erection of three brick dwellings on Hyde Park avenue, near Aberdeen avenue, $4,000; Stewart & Witton, erection of a brick dwelling on Duke street wert of Queen street, for G. J. Henderson, to cost $3,500.

North Vancouver, B.C.

Mr. F. C. Wade, K.C., of Vancouver, through Messrs. Robertson Bros., real estate brokers of Seymour street, has taken an option on a block here.

Quebec, Que.

Mr. Fitz James E. Browne, president of the house of Browne, Ltd., Montreal, is here to make arrangements for opening an office in connection with the erection of a large apartment building in this city

Waterloo, Que.

It is reported that the residence of Hon. E. Davarennes was destroyed by fire on the 2nd inst.

Winnipeg, Man.

The following building permits were issued recently: Duncan & Macdonald, house, north side of Grosvenor, $4,500; George Eshelby, house, north side of Bannerman, $2,200; M. Avren, four houses, south side of Lansdowne, $7,200; A. Simpson, house, west side of Ruby, between Portage and Buell, $4,000; R. Taylor, house, south side of Dorchester, between Stafford and Wentworth, $5,500; A. J. Carson, house, east side of Home, between Ellice and Sargent, $2,800; John Rogers, house, east side of Victor, between Livinia and Ellice, $3,500; P. Wiker, house, east side of Strathcona, between Portage and Classic, $2,800.

AWARDED.

Ottawa, Ont.

A. Slack, has been awarded the bulk contract for alterations to Louis M. Howard's residence, Rockcliffe. Arthur LeB. Weeks, architect.

Victoria, B.C.

D. H. Bale has been awarded the contract for a modern residence to be built by James Sheriff on Viewfield avenue

Business Buildings and Industrial Plants

Bridgden, Ont.

The Dominion Cooperage plant and stave mill was destroyed by fire on the 30th ult. Loss, $14,000

Chatham, Ont.

The ratepayers will vote on January 2nd on a by law to authorize the granting of a bonus to the Western Bridge & Equipment Company for the purchase of lands as a site for a building to cost not less than $10,000 and to be completed by July, 1911.

Chilliwack, B.C.

The Merchants Bank of Canada has purchased the corner of Yonge and Westminster streets, upon which it is their intention to build an up-to-date bank building as soon as the weather will permit.

Coblenz, Sask.

A hotel owned by G. M. Smith was destroyed by fire on the 29th ulto. Estimated loss, $15,000.

Edmonton, Alta.

The Bank of British North America have purchased a 50-foot site on Jasper avenue, on which handsome offices will be erected. J. McEachern, manager.

Fort Frances, Ont.

A by-law has been prepared granting the Shevlin, Clarke Company, Limited, fixed assessment, etc., in return for which they will establish sawmills, planing mills and other industries here.

Coquitlam, B.C.

It is understood that the C.P.R. will utilize the block of land purchased here for its mechanical headquarters for the Pacific division, including roundhouses, shops and freight sheds.

Guelph, Ont.

Tenders for alterations and additions to the Bank of Montreal here are being called by Architect W. A. Mahoney.

Grand Falls, N.B.

Plans are completed for a 200-ton paper mill here by a company controlled by Jas. Robinson, of Millerton, N.B., and the Van Horne interests.

Humberstone, Ont.

Plans for Reeve John Goodwin's new three storey brick block have been completed.

Lindsay, Ont.

It is reported that the C.P.R. will build a new station here.

Lethbridge, Alta.

Buildings for the manufacturing and storing of ice will be erected shortly. C. F. Hoffman, manager; capital, $100,000.

London, Ont.

Plans for the additions to McClary's plant will be prepared shortly.

Meaford, Ont.

The canning factory by-law was defeated.

Midalo, Sask.

H. A. Meser's store and that of Wedin Bros. were burned to the ground on the 25th ulto. Total loss, $30,000.

Marmora, Ont.

The by-law granting to the Pearce Lumber Company, Limited, a fixed assessment was carried.

Merritton, Ont.

The Independent Rubber Company, capitalized at $500,000, will begin operations shortly in the building taken over by them. Jas. Robinson, of Montreal, is interested.

Montreal, Que.

It is stated that Messrs. Glickman & Glickman will add next spring several storeys to the building recently purchased, at present occupied by the Sisters in charge of the Academie of St. Catherine.

North Battleford, Sask.

Cushing Bros., of Calgary, will erect a warehouse here shortly.

We are informed that the International Harvester Company will not build until next year, when their plans call for a one-storey cement block, 70 x 75 feet, estimated cost, $10,000. Architect, A. Bell, North Battleford. P. Lanz, local manager.

Owen Sound, Ont.

It is stated that the Bell Telephone Co. has secured the building site for a new exchange. Plans call for two storeys with basement.

Ottawa, Ont.

It is stated that the Ottawa Vacuum Cleaner Mfg. Co., Ltd., will locate here if suitable quarters can be leased until the erection of their plant.

Quebec, Que.

The building occupied by J. P. Garneau, stationer, was damaged to the extent of about $30,000 on the 4th inst.

Richmond, Que.

The G.T.R. station at Richmond is reported totally destroyed by fire.

Regina, Sask.

Tenders were called until Dec. 1st for erection of warehouse for the Toronto Type Foundry Company, Limited. Messrs. Storey & Van Egmond, architects.

Renfrew, Ont.

Mr. McLean, of Bryson, Que., was in town recently looking for a location to establish a foundry and a machine shop.

Ridgetown, Ont.

This municipality is endeavoring to have a canning factory locate here. Mayor Henry, W. E. Morrison, and J. S. Clark are interested.

Swansea, Ont.

It is stated that the G.T.R. will erect a new station here.

Sarnia, Ont.

A by-law granting $5,000 to J. B. Hicks Gas Engine Company, who may establish an industry here, will be submitted.

St. Catharines, Ont.

The council are considering a by-law to grant exemption to Warren Bros., who, it is stated, are considering extension.

Sydney, N.S.

Messrs. McCuaig and Konig have had plans prepared for a large business block, corner of Charlotte and Wentworth Sts., $35,000; the Sydney Post Publishing Co. will, it is stated, erect next spring a 2-storey brick or reinforced concrete building on the Kimberly property on Dorchester street; McCuaig & Konig has purchased the Bank of Commerce propery, where a fine block will be erected.

St. John, N.B.

The Donaldson S.S. Line warehouse here was practically destroyed by fire on the 30th ulto. Estimated value, $30,000.

St. Thomas, Ont.

Permit was issued last month for factory for Monarch Knitting Company, $30,000.

Victoria, B.C.

The J. A. Sayward block in course of erection will be carried up six storeys instead of three, which will entail an additional outlay of about $75,000. Contractor, G. C. Mesher.

Vancouver, B.C.

The Western Steel Corporation has secured [illegible] worth of capital from the Carnegie Trust Company, of New York. Of this $2,000,000, it is stated, will be invested in a plant in this vicinity. Mr. Jas. A. Moore, president, Irondale, Wash., is expected shortly to close the deal for the site.

Tenders are called until December [illegible] for erection of office building for the

Tenders and For Sale Department

Tenders

for New Police Station—East Toronto

[illegible] tenders or tenders for the several trades mentioned below in connection with the [illegible] building will be received by registered [illegible] addressed to the undersigned up to noon on TUESDAY, 20TH DECEMBER, 1910.

1. Mason work, etc.
2. Carpenter work.
3. Galvanized iron and roofing.
4. Gas-fitting and plumbing.
5. Hot water heating.
6. Electric wiring and light fixtures.
7. Plastering.
8. Painting and glazing.
9. Tiling.

Plans and specifications may be seen and forms of tenders and all information obtained at the office of the City Architect, City Hall, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents. The usual conditions relating to tendering, as prescribed by City By-law, must be strictly complied with or tenders may not be entertained.

Tenderers shall submit, with their tenders, the names of two personal sureties or the bond of a Guarantee Company.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman Board of Control.
City Hall, Toronto,
December 5th, 1910. 49

City of Sherbrooke

Power Development at Rock Forest, Que.

Tenders will be received up to noon on WEDNESDAY, 28TH DAY OF DECEMBER, 1910, for the construction of a concrete dam and power house in the Magog River near Rock Forest for the City of Sherbrooke.

Tenders shall be marked on the envelope "Tender for Rock Forest Power," and forwarded to Ross & Holgate, Engineers, No. 80 St. Francois Xavier Street, Montreal.

Each tender must be accompanied by a marked cheque for Five Thousand Dollars ($5,000.00), payable at the City of Sherbrooke.

Plans and specifications may be seen at the office of Ross & Holgate, or at this office, where forms of tender may be obtained.

The lowest or any tender will not necessarily be accepted.

F. J. GRIFFITHS,
Secretary-Treasurer,
City of Sherbrooke.
November 28th, 1910. 49

Messrs. W. Burton Stewart, S. Ellis Stewart representing the firm of Norton, Griffiths & Company, Limited, England, are negotiating in regard to the opening of offices in Canada. The new company will enter the engineering field, both in the construction of modern steel-girder buildings as well as being large wharf contractors. Charles Duncan, A.M.I.C.E., is the chief engineer.

Business Buildings and Industrial Plants

B. C. Electric Railway Company, Limited. Plans, etc., upon application to W. Marbury Somervell, architect, 43 Exchange Building. W. H. Hazlitt, purchasing agent.

Plans were presented for the passenger terminal and office block of the B. C. Electric Railway Company.

Welland, Ont.

Mr. T. E. Reeb states that he will rebuild the machine shop recently destroyed by fire.

Woodstock, N.B.

The machine shop of Connell's foundry was destroyed by fire on the 28th ulto. Estimated loss, $21,000.

Winnipeg, Man.

Building permit was issued to the Western Paint Company for warehouse on Charlotte, $18,000.

AWARDED.

Brantford, Ont.

We understand that the contract for erection of additions to factory for the Brandon Shoe Company has been awarded to Shultz Bros. J. S. Dowling, secretary.

Ottawa, Ont.

The Dunning Sheet Metal Co. have been awarded the contract for sheet metal and galvanized iron work in the Barrett Bros.' Commercial building, also Ottawa Electric Co.'s warehouse.

The Ottawa Development Company are preparing plans for several residences to be erected on their property in Ridgemonte next spring. They will cost about $2,500 each. They will be built by St. Germain & Fraas, Bank street.

Arthur LeB. Weeks, architect, is preparing plans for a brick residence for W. M. Southam at Rockcliffe, $25,000. Work will be begun in the spring.

Regina, Sask.

The contract for the warehouse for the Plumbers & Engineers Supply Company, Limited, to be erected on corner of Seventh avenue and McIntyre street, has been awarded to Smith Bros. & Wilson. Estimated cost, $15,000.

Sydney, N.S.

Chappell Bros. & Co., Ltd., have had plans prepared for forty dwellings, all of which are to be erected on Prince street east. These buildings will cost from $1,000 to $2,000 each and will probably all be constructed before next mid-summer.

Victoria, B.C.

Parfitt Brothers have been awarded the contract for the erection of a three-storey brick building for the Lee Benevolent Association on the north side of Fisguard street, plans of which were prepared by C. E. Watkins. Cost, about $15,000.

Vancouver, B.C.

The firm of A. W. Quist, Seattle, has been awarded the contract for the construction of the $150,000 cold storage plant for the Canadian Fishing Company.

E. W. Benson, contractor, is in charge of the erection of the residence for Mr. Faversham, at Point Grey, cost $12,500. Mr. A. Hampton, who is acting for Mr. Faversham, has been instructed to secure a block of land for an English syndicate (of which the latter is the head), in Vancouver. A large hotel may be erected.

Power Plants, Electricity and Telephones

Berlin, Ont.

The council approved of the action of the Water and Light Commission in regard to the $40,000 to be raised by by-law in January. $10,000 of this will be spent on new lights.

Bowmanville, Ont.

A by-law will be voted upon on Dec. 27 on the granting of a franchise to the Seymour Power & Electric Company, Limited, to enter the limits of the corporation with poles, lines, plant and machinery, etc.

Calgary, Alta.

Tenders addressed to city commissioners will be received until Dec. 22 for supplying 1,500 h.p. synchronous motor generator, also one motor generator exciter set, including switchboard instruments. W. D. Spence, city clerk.

Fort William, Ont.

The ratepayers will vote on the $26,400 electric lighting by-law; the $67,000 street railway by-law will not be voted on.

Listowel, Ont.

On January 2nd a by-law will be voted on to issue $5,000 4 per cent. electric light debentures. W. Bright, clerk.

Marmora, Ont.

The by-law to purchase electric light plant was carried by the ratepayers.

Niagara Falls, Ont.

W. D'Arcy Ryan, electrical expert, has submitted his report re Cataract illumination, in which he estimates the cost of installing an elaborate plant at $70,000; 700 h.p. would be needed.

Owen Sound, Ont.

See "Business Buildings."

Ottawa, Ont.

The board of control recommends to council that the city undertake the lighting of Sparks street in the decorative style. If acceptable to the council, tenders will be called at once for ornamental poles, etc. Preference will be given to the contractors who can supply these soonest.

Porcupine, Ont.

The water power plant being constructed by A. E. Wallberg on the Metagami river will, it is stated, be completed by the end of June. This would furnish electricity for the Government road which is under consideration in that vicinity.

Quebec, Que.

A franchise has been granted to the Dorchester Electric Company to enter the city from the south shore and to supply electricity in Quebec. The company will erect a plant. The estimated cost is about $200,000.

Sherbrooke, Que.

Tenders addressed to Ross & Holgate, engineers, 80 St. Francois Xavier street, Montreal, will be received until Dec. 28th for the construction of a concrete dam and power house in the Magog river near Rock Forest. F. T. Griffiths, secretary-treasurer.

Tuxford, Sask.
Tenders were called until Nov. 22nd for construction of telephone system here. J. A. Stinson, overseer; J. B. Calver, secretary-treasurer.

Toronto, Ont.
The by-law to expend $1,128,360 on street railway extensions will be submitted to the ratepayers on January 2nd. The city engineer and city solicitor were instructed to prepare plans, specifications, etc., necessary to enable the city to advertise for tenders from all parties willing to undertake the construction and operation of an underground railway along Queen street from the City Hall to Sunnyside with any underground extensions which would be considered immediately practicable.

A deputation of Queen street merchants requested the council to order an extension of the new five-light cluster electric lights system as far as York street west, and east as far as Church street.

Victoria, B.C.
At the forthcoming civic elections, among other money by-laws to be submitted, will be one to authorize the raising of $25,000 for the purchase of electrical equipment for the extension and improvement of the street lighting system.

Vernon, B.C.
Tenders are being called until December 19th for electric light fixtures, wiring, etc., for public building here by the Public Works Department, Ottawa. Plans, etc., with F. B. Coffett, clerk of local works; Wm. Henderson, resident architect, Victoria; and above Department. R. C. Desrochers, secretary.

Waneta, B.C.
A power plant will shortly be erected at the falls near the mouth of the Salmon river.

Welland, Ont.
The directors of the Niagara Falls, Dunnville and Welland Electric Company have decided to go ahead with the construction of the road for which a provincial charter has been secured. Franchises from the towns and cities and townships through which the railroad will pass will be asked for.

AWARDED.

Calgary, Alta.
The contract for the twelve new single truck cars for the new extensions of the street railway were let as follows: The Preston Truck & Car Works supply the car bodies and the Taylor Truck Company, of Troy, got the contract for trucks. The cars are to be here by April, 1911.

The item appearing under Calgary in the issue of the 23rd ult. re the supply of copper wire should indicate that two car loads were supplied; one by the Canadian General Electric Company, the other by the Eugene F. Phillips Electrical Works, Limited. The latter also supplied copper wire cables for Winnipeg.

Miscellaneous

Ottawa, Ont.
The Government will, in a few days, call for tenders for four cruisers of the Bristol type, and six destroyers of the improved river class, in accordance with the naval construction programme decided upon last session. Plans and specifications for the new warships have been drafted in harmony with the suggestions of the Admiralty. The vessels will have all the latest improvements in armament, engine power, speed, and general equipment. Three years' time will be given for the delivery of the first ships.

Tenders addressed to Chas. Macnab, county clerk, court house, will be received until December 8th for supply and delivery f.o.b. cars Ottawa of one rock crushing plant, one jaw crusher; also for 100 tons of stone, etc.

The building permits issued recently include: James Wade, dwelling, Sherbrooke street, $2,300; Wolf Shenkman, double brick dwelling, Clarence street, $4,000; Auguste Boehmer, testing shed for Dominion Government, Cliff street, $4,400; Eugene Boutellier, dwelling, Clarence street, $2,500; G. F. Killeen, dwelling, Arlington avenue, $3,000; E. G. Brown, dwelling, $3,000, A. W. Clark, builder; C. A. Parker, factory, Wellington street, George Tomlinson, builder, $5,000.

Toronto, Ont.
Recent building permits include: Dr. T. J. Capon, 2-storey brick dwelling on Ruessell road, $14,000; Mr. Slatkin, two pairs semi-detached and two detached 2-storey brick dwellings on Gilmore avenue, $12,000; A. & A. Grant, one pair semi-detached 2-storey brick dwellings on Logan avenue, $5,000; R. C. Bustard, three 2-storey and attic brick dwellings, near Scarth, on Rowanwood avenue, $15,000; Wm. Priest, three pairs semi-detached 2-storey brick dwellings, Royce avenue, $12,000; J. Whelan, one pair semi-detached 2-storey brick stores and dwellings, Danforth, $5,000; F. Elliott & Sons, 2-storey and attic brick dwelling, corner Parkway and College, $6,000; R. Faskin, six attached 2-storey brick dwellings on west side Brock, $9,200; John Brown, one pair semi-detached 2-storey and attic brick dwellings, corner Lonsdale and Baker, $5,000; Sarah Reeves, four pairs semi-detached 2-storey brick dwelling, Perth and Ernest, $16,000; Booth Coulter Company, one-storey brick foundry, near Queen, on Lovatt place, $6,000; R. Grass, 2½-storey brick dwelling, corner Rowanwood and Cluny, $5,000; W. N. McEachren, four pairs semi-detached 2-storey brick dwellings, on Strathcona, $16,000; J. C. Eaton, 1½-storey brick stable, on Davenport road, $15,000; D. C. Smith, two detached 2-storey and attic brick dwelling on 15 and 21 Woodlawn, $8,000; Symons & Rae, 2½-storey brick dwelling on 190 Bloor street east, $8,000; W. S. Grimshaw, 3-storey brick theatorium and dwelling, 952 College street, $5,000; Fred. Brown, one pair semi-detached 2-storey brick dwellings on Sinclair avenue, $5,000; J. T. & H. Hutson, 2-storey and attic brick dwelling, Oriole road, $5,000; J. H. Galloway, in trust, 2-storey brick apartments, west side Triller, $7,500; Weismiller & Mackenzie Bros., three pairs semi-detached 2-storey brick dwellinbs, corner Rideau and Macdonnell, $12,000; E. Taylor, three detached 2½-storey brick dwellings, northeast corner Forest Hill road and Heath street, $8,000; F. J. Smith, two detached 2-storey brick dwellings, north side Chicora avenue, $7,000; E. Hudson, one pair semi-detached 2-storey brick dwellings on south side Hallam, $5,000.

Vancouver, B.C.
The following building permits have been issued: McLellan & McCarter Company, frame [illegible], $20,000; Mrs. Burboss, frame dwelling, 2036 Grant street, [illegible]; S. S. [illegible], frame dwelling, 1237 Harwood street, $8,000; W. F. Winter, brick addition, 826 Howe street, $2[illegible].

New Companies

The Canadian Electric Fixture & Contracting Company, Limited, Toronto, Ont., capital $40,000. Incorporators: Samuel Wood, electrical contractor; Harry M. VanGorder and William Burton, all of Toronto, Ont.

The Electric Installation Co., Limited, Toronto, Ont., capital $40,000. Incorporators: John Berry Ferris and James Pavitt Archer, merchants, and Arthur Boucher Colville, barrister-at-law, all of Campbellford, Ont.

The Owl Metal Company, Limited, Winnipeg, Man., capital $40,000. Incorporattors: Wm. P. Fillmore and Stephen E. Richards, barristers, both of Winnipeg.

The Empire Coal & Lumber Company, Limited, Sudbury, Ont., capital $40,000. Incorporators: Wm. Matheson, lumberman; Wm. A. Evans, contractor, both of Sudbury, Ont.

Loomis-Morden Cooperage Company, Limited, Trenton, Ont., capital $30,000. Incorporators: Chester Loomis, gentleman, and Homer B. Loomis, lumberman, Trenton, Ont.

Security Lumber Company, Limited, Winnipeg, Man., capital $500,000. Incorporators: John P. Jansen, manager; Lorne J. Elliott, barrister-at-law, both of Winnipeg.

Mexican Mahogany & Rubber Corporation, Limited, Montreal, Que., capital $1,000,000. Incorporated to do a general business as lumbermen and manufacturers and exporters of lumber, timber, logs, etc. Incorporators: Leopold Barry, advocate; Chas. L. Austin, manager, both of Montreal.

Norton Griffiths & Company, Limited, Winnipeg, Man., capital $1,000,000; incorporated to carry on the business of general contractors. Incorporators: Albert C. Ferguson, barrister; Jno. Taylor and James Coupar, solicitors, all of Winnipeg.

Imperial Engineering Company, Limited, Montreal, Que., capital $100,000. Incorporators: Jno. J. Creelman and Alexandre Jodoin, advocates, Montreal.

Bishop Construction Company, Limited, Montreal, Que., capital $500,000. Incorporators: R. C. McMichael and R. O. McMurtry, advocates, both of Montreal.

Mercantile Lumber & Supplies Company, Limited, Montreal, Que., capital $50,000. Incorporators: P. E. Brown and E. E. Kent, dentist, Ste. Anne de Bellevue, Que.

Canadian Mono-Rail Car Corporation, Limited, Montreal, Que., capital $2,000,000. Incorporators: L. A. David, barrister; Geo. Salmon, engineer, both of Montreal.

The Eastern Pipe & Construction Company, Limited, Alexandria, Ont., capital $50,000. Incorporators: Dr. E .G. Mullaly, F. H. Mackay, both of Montreal.

The B. C. Gazette gives notice of the incorporation of the following companies: North American Lumber Co., Ltd., capital $100,000; Electrical Advertising Co., Ltd., capital $40,000; the Canadian Electric Manufacturing [illegible]; Penticton Lumber Co., Ltd., capital $200,000; Canadian Timber Co., Ltd., capital $1,000,000; Colonial Lumber, Paper Mills, Ltd., capital $2,000,000; Canadian Dry Battery Co., Ltd., capital $25,000; Red [illegible] 000; Upper Moyie Electric Co., Ltd., cap[illegible]

Dominion Sewer Pipe Company

The Dominion Sewer Pipe Company, Limited, Swansea, Ont., whose products are known from the Atlantic to the Pacific, was incorporated in 1903, and commenced shipping early in 1905. Operations were commenced with four kilns. The total number of these is now ten with an annual output of 1,200 cars. The city of Toronto takes the greater part of the firm's production. The demand from outside points will doubtless necessitate extensions in the near future. The salt glazed and vitrified sewer pipe manufactured by this concern is true to size and impervious to water. Sizes from 4 inches to 24 inches are always in stock. Other lines include chimney tops, wall coping, flue linings, culvert pipes and inverts. The progress of this industry during the past few years is attributable to the quality of the products, their prompt delivery and the business-like methods of the management.

Where "Mimico" Brand Sewer Pipe is Made

The offices and factory of the Ontario Sewer Pipe Company, Limited, are situated at Mimico, Ont., on the main line between Toronto and Hamilton. This plant began operations in a small way about twenty years ago, endeavoring to make a first-class sewer pipe out of the clay surrounding the factory. Finding this an impossibility, a large farm of the finest clay land was purchased in the vicinity of Waterdown. At this point success began to replace repeated failures. In a few years "Mimico" pipe were known from Quebec to the Rockies and orders were plentiful. The little shop began to grow, additions were made, extra equipment was put in, new kilns replaced the old, and the screech of the press exhaust could be heard the whole year around.

The Up-to-Date Plant of the Ontario Sewer Pipe Company.

The plant is now a very modern structure, as the expansion has been carried out with an eye to economy. Seven 37 foot round down-draft kilns are kept continually in use, and fifteen acres of land piled high with pipe represents the stock on hand.

An unbroken Mimico pipe is strictly impervious to water or the acids of sewage. To show how nearly perfect is vitrification, even in the largest pipe made there, we give below the result of a test made this year by Mr. W. G. Swan, department of applied mechanics, University of Toronto. Two tests were made on 24 inch Mimico pipe and two on 24 inch Ohio pipe—the recognized standard across the line.

They were not selected sections, but were taken at random from some broken pieces on actual construction work near Toronto.

Absorption Test of Vitrified Clay Pipe.

			ABSORPTION.				
Class of Pipe	Original weight of Section	Weight after drying 24 hours Temp. 212 deg. F.	Weight at end of 24 hours.	Percentage Increase.	Weight at end of 48 hours.	Percentage Increase.	1 drop water on glazed surface.
	Lbs. oz.	Lbs. oz.	Lbs. oz.		Lbs. oz.		
Mimico	2 02 1-16	2 01 15-16	2 02 ⅝	2.03	2 02¾	2.39	No absn.
Mimico	2 07¼	2 07⅛	2 07 ¾	1.59	2 07⅞	1.91	No absn.
Ohio	2 0⅞	2 0¼	2 01 ¼	3.10	2 01¼	3.10	No absn.
Ohio	1 03⅛	1 03	1 03½	2.63	1 03¾	3.95	Through glasing

Mr. W. P. Robinson, representing the Advance Machine Works, Limited, manufacturers of travelling cranes, etc., Walkerville, Ontario, has opened offices at 623 Traders Bank Building, Toronto.

Steger System Silica Brick Plant

December 1st next will find in operation in Vancouver what is confidently expected to prove the most improved and up-to-date silica brick plant on the American continent. It is being installed for the Pacific Pressed Brick Company, at 1026 Beach avenue, Vancouver, by Col. William B. Dickie, general manager of Steger Brick for Canada, the United States and foreign countries. The consulting engineer in charge of the work is Mr. J. W. Farrier, Jr., of Bonham, Texas, who has put in the best years of his life in perfecting the silica brick and its manufacture. Mr. Farrier is confident that the Vancouver plant will repay him for his close study and application by proving superior to all others. Col. Dickie feels especially proud of this plant, as it embodies several improvements in the mode of manufacturing and handling the brick that have been made applicable since the last plant in the United States was erected.

The capacity of the plant will be 40,000 high-class pressed face brick daily, but the company has wisely made the buildings large enough, and have put in sufficient engine and boiler power, to permit of the output being doubled in order to take care of the bulk of the demand in this section of the province for many years to come. It may be interesting to note that Steger System brick is extensively used in the United States. Whenever procurable it is specified by the Government for new armouries, barracks and forts. The output of the plants under this system is known as the very highest grade building material. It is claimed to have been demonstrated under exhaustive tests that it can sustain a heavier crushing load than any other brick; and as the absorption test is low, this class of brick seems especially adapted to the wet climate of the Pacific Coast.

The local men interested in the Pacific Pressed Brick Company, Limited, have secured the exclusive rights to use this system for the Province of British Columbia. They purpose erecting at once duplicates of the Vancouver plant in Victoria, Prince Rupert and other cities in the province, as well as increasing the capacity of the home plant.

Mr. Bengamin Allen, C.E., of Portage la Prairie, was united in marriage on the 23rd ult., to Miss Lilian Ridout.

The City of Hull, Que., is now constructing a main sewer, one part with reinforced concrete and the other part with brick. The portion constructed with brick is 880 feet long, egg-shaped, 48 inches horizontal diameter, and 72 inches vertical diameter, double ring 8½ inches thick. Hard burnt brick at an average price of $22.00 per thousand, is being used.

Contractors and Builders Supplies

Crushed Stone

For Concrete Fireproof Construction, Roadwork and Sidewalks

Rubble, Portland Cement

CRUSHED GRANITE for Floors and Sidewalks
SEWER PIPE WEEPING TILE
FIRE BRICK FIRE CLAY

Crescent Fire Brick

We are exclusive Distributing Agents for this high grade, hand-made fire brick. Large stock always on hand.

Don't forget our Prompt Delivery Service.

The Rogers Supply Co. - Toronto

Head Office: 28 King Street West Phone Main 4155

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

Hoisting Equipment

FOR EVERY PURPOSE

We Make a Specialty of Hoisting Machinery and all Accessories Including

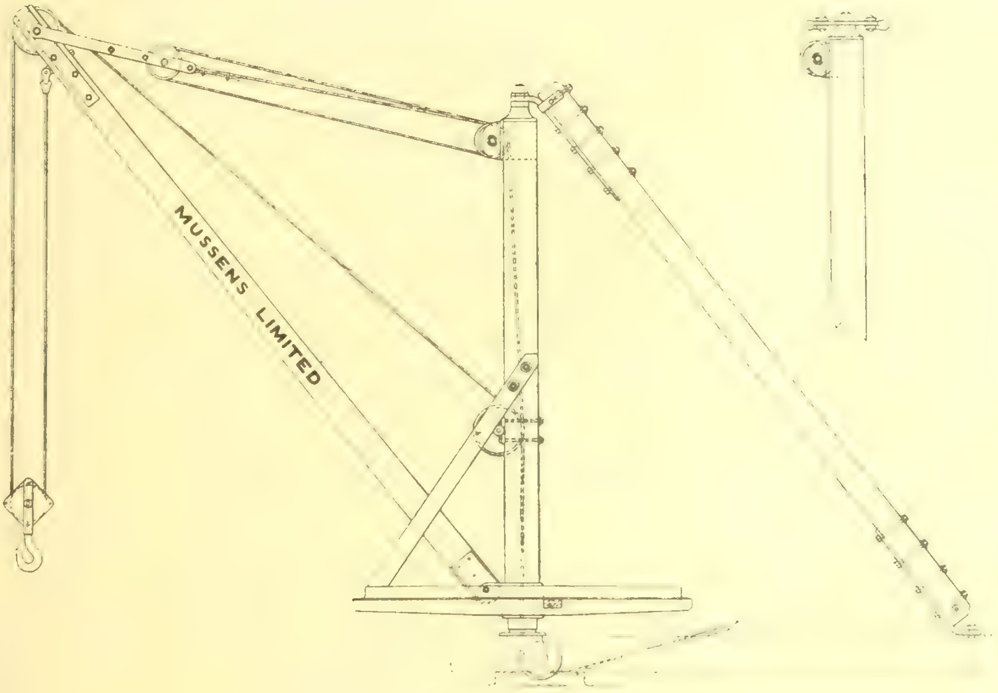
Contractors' Hoists
Cableways
Builders' Elevators
Mine Hoists
Derricks, Winches
Wire Rope and Fittings
Wire Rope Blocks
Manila Rope, etc., etc.

D.C. D.D. Contractor's Hoist with Boiler.

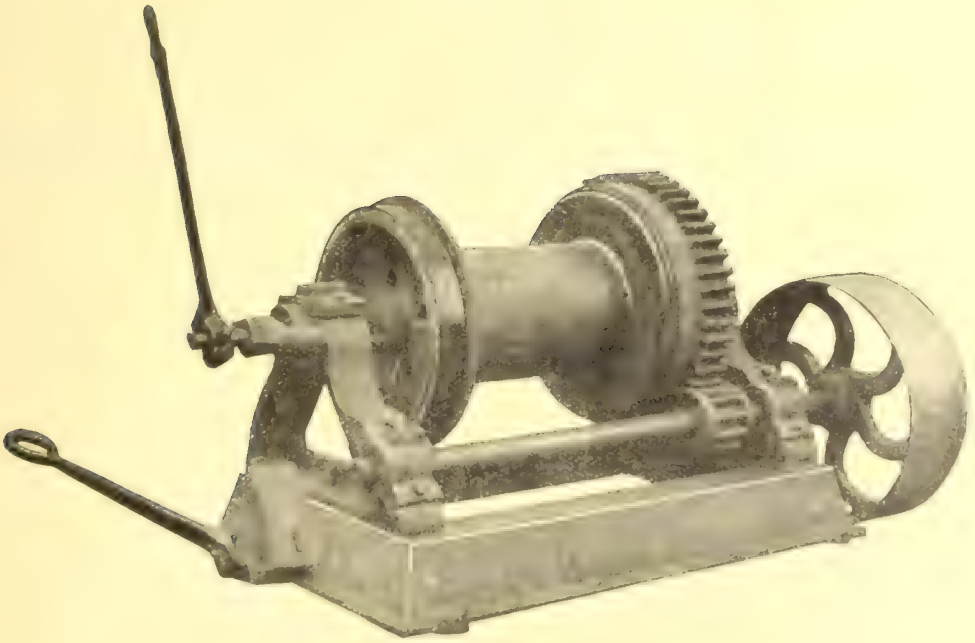
If you are contemplating installing any kind of Hoisting Machinery get our catalogues and quotations, which we will be glad to mail you promptly on request.

Head Offices and Warehouses :
Montreal

MUSSENS



Special Stiff Leg Derrick.



Single Drum Belt Driven Hoist.

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

The "Hercules" Briquetting Press

Write us for full particulars in regard to our Special Machinery for Brick-making Plants.

THE QUARTZLITE LAMP

CANADA FORD COMPANY

485 St. James Street - MONTREAL

STEAM AND ELECTRICAL DRIVEN SHOVELS

Sewer Pipe

Portable and Locomotive

GRAB ELEVATORS

for Handling Coal Economically, for Steam Operated Blast Plant and for Handling Stocked Shale.

Conduit

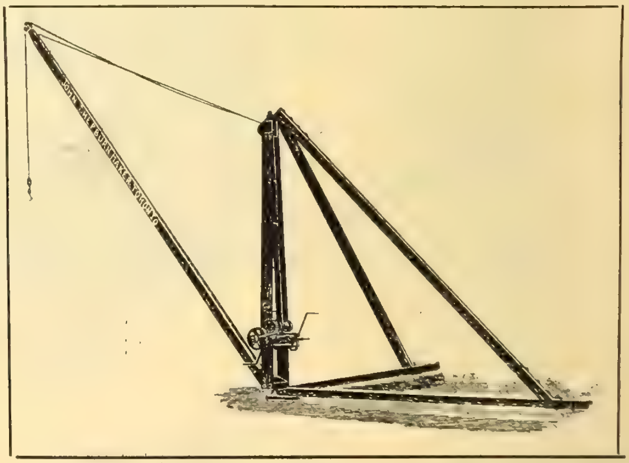
Wire Rope any size for all purposes

Every "Hepburn" Derrick, when it leaves our works, is equipped with an ample length of first quality wire rope.

But one Derrick will outlive many a rope. Our Wire Rope is

Strong, Flexible
and
Thoroughly Tested

When your old rope is worn, when you need wire rope of any size, in any quantity or for any purpose, you cannot do better than send direct to us for it.



Let us send you Quotations

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED

HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.

HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 December 7, 1910 No. 49

Clay Products

The merits and claims of clay products are so universally recognised and the possibilities of the industry are so great that no apology is necessary for the publication of a number devoted exclusively to this field. In an article contributed to this issue, Professor Gillespie writes: "Begun in prehistoric days when primitive man fashioned the clay and baked it in the sun; developed and improved with the accumulated experience of succeeding ages and perfected in recent times through the investigations of the ceramist and the chemist, the brickmaker's art commands a respect and possesses a prestige analogous to that which attaches to an old and honorable family. The product has been tested and proved through use in all ages, and for it there will always be a demand."

By a broader application this includes the whole field of clay working. New uses may be found for other materials and doubtless we shall live to see many innovations in concrete and other forms of construction, but clay products will go on forever; the earliest constructive material, it will probably be the last. It will be instructive to consider the condition of this ancient and honorable industry.

To begin with brick, the progressive manufacturer is making a continuous effort to produce the best article for the least money. Any good man in the business will acknowledge that this is essential. So far, so good. But there is another thing that must be regarded as essential, and that is educational publicity. The trade is fully alive to the merits of brick. But what about the public? The brick manufacturers are scattered and what they do, they do individually. It has been well said that brick dealers would be better advised to seek to increase the general use of brick by endeavoring to get the business of the nine people out of ten who favor some other material than by devoting their attention exclusively to the one who intends to use brick. Examples of what may be accomplished in the way of publicity are plentiful but they do not emanate, to any great extent, from the manufacturers of clay products. Why should not they have an annual exhibition, the best of its kind that money and brains can provide? The funds are surely obtainable and there are certainly enough intelligent men in the industry to organize a thing of this kind. The one thing lacking is enthusiasm, and this is indispensable to success.

We would emphasize the necessity of the manufacturer's keeping uppermost in his mind the improvement of his product. The industry collectively suffers for every low grade article turned out by the individual. If the undisputed excellence of clay products is to be used as the principal argument, it must not be weakened by the production of an inferior article. Eternal vigilance is essential. The manufacturer must watch the market closely, increase his output, cheapen his production and ever be alive to the latest trade developments—such as improved appliances. Clay products must be improved and the sphere of their adaptation widened. The interest of the architect, the engineer, the builder and the municipality must be stimulated by extending the scope of manufacture as regards texture, color and purpose. It is upon these things that the actual progress of the industry is dependent. Canadian manufacturers, generally, recognize this. To quote once more from Professor Gillespie's article: "They have shown a commendable enterprise in keeping pace with a progress that insists on an article, structurally and artistically the best that skill can produce. In these two particulars the products of our best Canadian plants are not surpassed in America."

In a short outline of the work of the Canadian Clay Products Manufacturers' Association, published elsewhere in this issue, we have discussed briefly the need for the establishment of a ceramic school. Extended comment is unnecessary. Suffice it to say that the manufacturers should make an insistent and determined effort to obtain the co-operation and assistance of the authorities, for the consummation of this project will mean much to the industry.

The Situation and Outlook

Nineteen hundred and ten has been a record year in building construction all over Canada. The demand for all lines has been well maintained throughout the season, and the year is closing with the market steady and in excellent shape for 1911. There is a noteworthy demand for the higher grades of pressed brick, the prices of which are being well maintained. People are becoming educated up to the possibilities of the material, and a gratifying tendency to use the best that money can buy is increasingly evident. A feature of the market is the manner in which porous terra cotta for fireproofing is coming into favor with the architects. The demand for common brick has been heavy and insistent all the season. No accumulated stocks are to be found, even with the advent of winter.

The extensive paving operations, new sewerage systems and the erection of many notable public and commercial structures have resulted in general activity in the industry. A perusal of our Contracts Department will disclose the fact that many important public improvements are contemplated. These will involve the use of all kinds of brick, sewer pipe, roofing and building tile, and various specialties. Every indication points to a record breaking season for manufacturers next year. All branches of the industry are optimistic and everywhere special preparations are being made to meet the growing demand.

Production, Export and Import

We are indebted to the Department of Mines for some interesting statistics relating to clay products. The figures for 1909 may be of additional value in view of the fact that the report of the Department is still in press. Owing to the large number of manufacturers, and the indifference of many in answering circular inquiries, the statistics of production are more or less incomplete. The figures given represent actual sales. The material produced and held in stock until the end of the year was not recorded until disposed of.

According to the returns received, the total value of the clay products sold in 1909 was $6,450,840, as compared with $4,500,702 in 1908. The manner in which these totals are distributed is shown in the following table, which also contains a similar statement for 1907:

Production of Clay Products, 1907, 1908 and 1909.

	1907.	1908.	Value 1908.
Bricks -			
Common	$3,455,524	$2,611,554	$4,212,424
Pressed	794,722	517,180	630,677
Paving	72,354	59,456	67,408
Ornamental	47,288	18,535	8,866
Firebrick and fireclay shapes, etc.	131,322	110,302	78,132
Other clay bricks and blocks	89,389	170,211	113,886
Pottery	253,809	200,541	285,285
Sewer pipe	667,100	514,362	645,722
Tiles, drain	260,609	298,561	408,440
Totals	$5,772,117	$4,500,702	$6,450,840

The decrease shown for 1908 is the second in the ten-year period from 1900 to 1909, during which the advance recorded is more than 100 per cent. This will be seen from the following figures: 1899, $2,988,099; 1900, $3,195,105; 1901, $3,382,706; 1902, $3,625,489; 1903, $4,034,289; 1904, $3,841,560; 1905, $4,709,842; 1906, $5,072,635; 1907, $5,772,117; 1908, $4,500,702; 1909, $6,450,840.

A noticeable feature in connection with the returns is the uniformity of the gains, this indicating the healthy progress of all branches of the industry.

Practically al our productions of clay find a market in Canada. The only export recorded is brick, the highest annual return being $12,786 for 1902. In addition to our own production we import for our consumption a considerable value in clay products, including building and paving brick, tile and sewer pipe. The total imports for 1909 were $815,033, as compared with $1,079,556 for 1908. The decrease is significant perhaps of the increased opportunities for profitable buying of Canadian manufacturers. This is only natural, having in view the fact that during recent years important extensions have been made by most of our large plants and improved appliances added, these things resulting in the production of a better article in a greater quantity and at a decreased cost.

The value of the production of common and pressed building brick is shown by provinces for the years 1907 to 1909 in the next table:

Production of Common and Pressed Brick, 1907-09.

	1907.	1908.	1909.
Nova Scotia	$110,338	$56,064	$114,795
New Brunswick	36,937	54,573	44,330
Quebec	715,922	601,874	690,918
Ontario	2,311,499	1,664,184	2,557,068
Manitoba	465,282	254,591	544,548
Saskatchewan	125,459	87,566	144,316
Alberta	353,672	240,336	441,606
British Columbia	131,137	169,546	305,520
Totals	$4,250,246	$3,128,734	$4,843,101

The manufacture of paving brick is at present limited to Ontario. The returns for 1909 total $67,408, the average price being about $20. There is a duty of 20 per cent. on imported paving brick. During 1909 the quantity brought into Canada represented a value of $101,187, compared with $61,346 for 1908.

The value of the sewer pipe produced in 1909 showed an appreciable increase for 1908, the totals being $645,722 and $514,362 respectively. Contemporaneously with this increase may be noted a decrease in the value of imported drain tile and sewer pipe. The 1909 total for the latter products was $106,399, compared with $125,747 for the preceding year. Here the same argument is applicable: that the improved facilities for home manufacture are making foreign competition increasingly difficult.

The Work of the Geological Survey on Clays

As one of the most important, from the industrial standpoint of all mineral products, clay has always received more or less attention from geological investigators. As a rule, however, the general public has so far failed to realize the prominent position clay takes in the mineral industry.

In the United States, remarkable for its enormous coal, oil, iron, copper, silver and other mineral industries, clay and clay products furnish 7 per cent. of the annual value of the entire mineral production (total mineral production say $2,000,000,000, clay $140,000,000), and it must be borne in mind that from the nature of the industry complete returns cannot be obtained. It is an industry that does not mature early in a new country, consequently, in Canada one would expect to find it occupying a comparatively subordinate position, yet it forms six per cent. of the annual value of the mineral products, exclusive of what is used in Portland cement.

The Geological Survey of Canada, from its organization in 1842, has given attention to Canadian clays. In the excellent volume, "Geology of Canada," published in 1863, summarizing the results of geological investigation to that date, much valuable information is given relative to the clays of Ontario and Quebec. In almost every report issued since that date some information regarding the distribution of the clays or shales of the district reported upon is to be found. In 1885, Dr. R. Chalmers, of the Survey, issued a report on the surface geology of New Brunswick, in which the occurrences of the clays figure prominently, and from that time forward his attention was devoted to the study of surface geology, including the distribution of the clays in the Maritime Provinces and Quebec. In 1905 and 1906, he was studying the surface geology of the Northwest Provinces and British Columbia, and, at the time of his death in 1908, he was preparing a work on the clays of Canada, in which would be compiled the information gathered up to this time on the subject. Owing to his death this project has, for the time being, necessarily been abandoned.

Mr. Joseph Keele, one of the younger members of the Geological Survey staff, was selected to take Dr. Chalmers' place as an expert on clays. Mr. Keele's experience in survey work had been varied, covering practically all parts of Canada, and the knowledge thus gained of the geology of the country formed a good foundation from which to specialize on clays. For the past two years, Mr. Keele has been working on clays under the guidance of Dr. Heinrich Ries, Professor of Economic Geology in Cornell University, the recognized authority on clays in America.

Last year Dr. Ries, assisted by Mr. Keele, studied the shales and clays of the Maritime Provinces. Their study embraces not only the occurrence of the clays in the field, but also exhaustive laboratory tests as to the qualities and industrial uses of the various materials found and collected. Dr. Ries' complete report of this work is now in press and will shortly be issued by the Geological Survey.

The work of Dr. Ries and Mr. Keele in the Maritime Provinces included not only an examination of the worked deposits, but also the unworked ones throughout the area studied. At all points where beds of a promising nature were found, they were carefully sampled so as to obtain an average lot for testing. These samples were then shipped to the laboratory for further examination. The tests included a determination of the plasticity, air shrinkage and tensile strength of the raw clay; its fusibility; and its fire shrinkage, color, and density at different temperatures.

These tests were made for the purpose of obtaining data that would be of value to the practical man.

The results of this work have demonstrated the fact that the provinces of Nova Scotia and New Brunswick contain a number of clay and shale deposits of value and interest to the clay worker.

The fictile resources of the two provinces should be mentioned separately.

Nova Scotia.

The investigation carried on by the Geological Survey has shown that the most important clays and shales are found in the coal measures, while second in importance are the deposits of surface clay. The former were examined with especial care.

In the Sydney field it was found that there are a number of clay and shale exposures outcropping along the shore line from the Big Bras d'Or to Cow Bay. In places, sandstones and shales occur in rapid succession, so that the one cannot be mined without the other, but at other points the shales are prominent. One type found on Cranberry Head, near Sydney Mines, approaches closely in its characters to those of a paving brick shale. A second type, a soft red, at times gritty shale, outcrops on the north shore west of the base of Cranberry Head, and forms an excellent brick material, being one of the best red burning materials in the region. This shale works up either wet or by dry press methods. The same shale type is found along the coast to the westward, and even in some other coal measure areas. In addition to these, several other occurrences of importance were noted. Of the coal-measure shales of the Sydney coal region, there are a number of deposits, although not of unlimited size, that might be used for common or red pressed brick. One at least (Cranberry Head) may serve for making paving brick. One buff burning clay (Toronto Mine), was found to occur under a coal seam. No true fire clays were found, although there were many rumors of their occurrence. These probably originated from the fact that it is a common custom among coal miners, to speak of every "under-clay" as a fire clay.

The Pictou coal field was found to contain more and heavier shale beds than the Sydney area, but they show a greater development in the central part of the region. Those occurring there are adapted to the manufacture of pressed brick, sewer pipe and flue linings, and some of them are among the most refractory clays found in the coal measures. The laboratory test showed that in some cases there was an appreciable difference in the refractoriness of shales occurring in neighboring beds. Near Westville a shale is mined which makes a hard buff brick.

Most of the shales in the Pictou field have to be carefully burned, because of their high carbon and sulphur contents. Important deposits of red and buff burning clays, suitable for pressed brick manufacture, were also found near Woodbern, on the northeastern edge of the area.

An important discovery was that of a very plastic, buff burning, fire clay, suitable for stoneware manufacture, overlying the 13-foot seam at Inverness, C.B. This deposit is traceable for some distance.

The most widely distributed materials are the surface clays, which are now used almost exclusively for common brick manufacture. A belt of these occurs in the Shubenacadie Valley, and another in the Annapolis Valley. They are smooth, highly plastic, red-burning clays, and, although utilized now only for brick and drain tile, they could, in many cases, also be employed for common earthenware, art pottery, and perhaps even roofing tile and fireproofing.

Most remarkable of all, however, is a deposit of whitish and mottled clay found at Shubenacadie and in the Musquodoboit Valley, between Middle Musquodoboit and Elmsdale. The material is a very plastic, fire clay, often of good grade, and of a type used in the manufacture of fire brick, stoneware, and terra cotta. It is not worked at present, but with the development of transportation lines must become an important clay resource of the province.

New Brunswick.

The work of the Survey was confined to the eastern part of the province, but here some important results were obtained. Thus it was found that in the Grand Lake coal area, which is crossed by the new transcontinental railway, the coal areas are at several points associated with shale beds of some value. One from the Evans mine, near Salmon Bay, yielded especially good results, burning to a fine, buff, speckled product. Another fine shale, was that discovered from Flower Cove, which also burns to a buff product. Other good, but red burning shales, were found near Albert Mines in Albert County, and at Beersville, twelve miles southeast of Harcourt. All of these New Brunswick materials referred to are undeveloped, but should not remain so.

Western Work in 1910.

During the past season Dr. Ries and Mr. Keele have been investigating the clays and shales of the Northwest Provinces and British Columbia, and the results promise to be as important as those obtained in the Maritime Provinces. While a good beginning has been made along lines that will be most helpful to clay workers, the field in Canada is so vast that it will be years before anything like completeness can be attained, but the work is so important and the industry has such potentialities that the investigation will be pushed forward as vigorously and as rapidly as circumstances will permit.

The geological survey investigations in the West have covered in reconnaissance, the region between Winnipeg and the Pacific coast. In this area there are extensive deposits of surface clays, which are worked at a number of localities. In Manitoba, the Pierre shales, so widely distributed, should form an important source of supply, while the cretaceous and tertiary shales of Alberta already promise to become the basis of an important clay working industry. Fire clays are worked at Sumas Mountain, near Vancouver, and surface clays at several points near that city, as well as in the vicinity of Victoria.

At the present time pressed, hollow, and fire brick are imported in large quantities from the United States, but there is no apparent reason why many of these should not be manufactured in the Western provinces.

These later investigations will be made the basis of a detailed report, which will include tests of all the more important materials occurring in this western area.

When you shut down for the winter, instead of letting your machinery stand and rust, keep things alive by starting in early to make whatever repairs, alterations and additions are necessary to put you in excellent shape for the next season.

Reduce your kiln waste as much as you can without making the reduction cost more than you get out of it and then remember that crushed scraps of brick and burnt clay make an excellent road material, the next best thing to brick paving, in fact.

It is not only interesting to observe that for proper decoration concrete people must turn to clay products, but it is also worth while to note that in some of the best reinforced concrete buildings one finds them turning to hollow clay blocks for fireproof partition walls and for other fireproofing work

Use of Brick in Municipal Construction

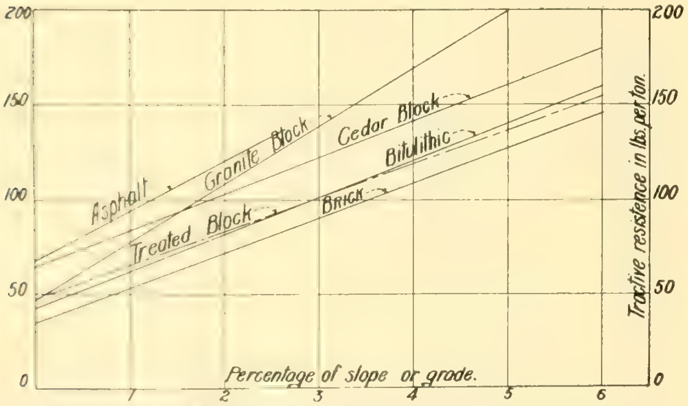
Various Advantages Outlined—Brick in Paving Work—Details of Various Tests Conditions Favorable to Use of Brick in Sewer Construction

Specially Contributed by A. C. D. BLANCHARD, A.M.CAN.SOC.C.E., Toronto

In view of recent developments introducing a large number of comparatively new constructional materials, it becomes a matter of interest to consider briefly the status of brick among the most important of such materials, and to give a short resume of its uses and advantages in municipal construction.

In the first place, a little thought will show that brick, concrete and stone work are allied types of masonry, in which the common binder is cement mortar. It is not strange, therefore, that the field of one should encroach upon the bounds of the others, and that frequently each of the different types are used for identical purposes in different localities. The two influences causing such variations in usage are: first, the judgment of the designer, and second, local conditions.

It is safe to say that the merits of brick as a base of construction have not been laid before the public by any extensive campaign of advertising on the part of its manufacturers, excepting in one or two isolated instances. On the other hand, during the past decade, a vast amount of literature has appeared in the technical press, newspapers and innumerable pamphlets and catalogues, setting forth the economy and advantages in general of concrete, plain, reinforced, and in the form of blocks, of patented paving materials; and of many other articles which are now being thrown on the market in ever-increasing numbers for many uses. It is only natural that these latter materials are cutting into the field formerly occupied by brick alone; yet, at the same time, owing to the tremendous expansion in business of the country, it is still difficult for the brick manufacturers, doing business at present, to keep pace with the demand for the best quality of brick for engineering work.



Resistance of Various Pavements to Tractive Effort in Pounds Per Ton

While it might be interesting to hazard the amount of increase in demand consequent upon the reduction of price of the article itself and of the skilled labor necessary for bricklaying, it is not the intention at present to discuss the economies of the subject, the law of supply and demand, or the effect of downward fluctuations in prices.

Brick in Pavements.

Probably the chief use of brick in municipal work is in the construction of pavements. In this connection it is easily reckoned one of the best, being durable, easily maintained and easily repaired. It offers a minimum resistance to traffic, more especially on streets which are approximately level and where the joints are sufficient to afford a firm foot-hold for horses.

It is not out of place at this stage to describe some experiments made by the writer two years ago, in order to show the different amounts of tractive effort required in hauling loads up various grades. Incidentally, these experiments offer an interesting comparison between the respective classes of paving surfaces which were used in the demonstration.

The information obtained formed the subject of a short paper read before the Canadian Society of Civil Engineers, and a diagram showing the results of the test is here reproduced, in order to illustrate the excellent position of brick pavements among its fellows. The experiments were made with a lorry hauled by two horses. The lorry and load together weighed over five and one-half tons.

The excellence of brick as a paving surface is well described by the city engineer of Toronto, in his last annual report, wherein he states that, "It is a great pity that more of this pavement could not be used, as it is one of the most satisfacory we have."

The usual method of laying a brick pavement is by spreading upon a concrete base a cushion of sand and laying the paving bricks as close together as practicable. The bricks should be laid with their lengths at right angles to the line of the street. The thickness of concrete base depends upon the probable traffic. After the bricks have been properly laid to grade for a short section, grout is poured into the joints.

In order to achieve good results, brick must be specially manufactured for pavement work. In some cases the ordinary standard shaped brick is used, giving a somewhat cheaper, though less efficient, pavement than the vitrified blocks. The blocks are somewhat larger than ordinary brick, being 3½ inches wide, 4 inches deep and 8 to 9 inches long. Since joints are always a source of weakness, these blocks are more satisfactory from the standpoint of wear. It is usually found that under heavy traffic the joint wears slightly below the upper edge of the brick, and the brick is slowly broken down as far as the joint. The joint may disintegrate finally to a sufficient extent to cause a noticeable roughness, and the wearing process, though extremely slow, eventually tells on the life of the pavement. It follows, therefore, that in laying brick pavements, one of the chief features is the grouting; upon this depends the efficiency of each joint. A Portland cement grout is the best filler and should be applied with a scoop shovel dipped from the grout box. If any other method is used, such as tilting the box or flushing over a large area with a pail full of grout, the fine cement will carry the farthest and the joints nearest the box or pail will be filled mostly with sand, the result being patchy and imperfect. It is better to have a pavement of softer blocks with properly filled joints than to have blocks of the very best quality poorly jointed. A pitch or asphalt filler is sometimes used at street intersections where the traffic will not permit the time necessary to allow the proper setting of cement. Pitch filler is not so durable and requires more attention in summer as it becomes soft under the heat.

Such bricks as are used for pavement work require most rigid inspection. They must be thoroughly and evenly burned and must be of such density as to have the quality of absorbing an extremely small amount of water. Vitrification must be carefully obtained in order to leave the brick tough and free from unevenness in burning. Upon its qualities of toughness and absorption, the life of the pavement depends, for it is not only subjected to the wear of heavy traffic, but must also withstand the demoralizing influence of frost.

Three tests are usually made on brick submitted for use in pavements, as follows:

(1) THE RATTLER OR ABRASION TEST.

This consists in placing a number of brick in a rotating receptacle, together with a specified amount of iron balls, or other weights. The rattler, which is standardized by the Brickmakers' Association, is revolved for a definite number of revolutions, and the brick are thrown against each other and struck by the weights. After the specified number of revolutions, the bricks are taken out and weighed. This process is extremely severe and only the best quality of brick will stand up under the test. The results of a number of tests are given in a succeeding paragraph.

(2) ABSORPTION TEST.

This test is made in various ways, but is usually performed by removing a large fragment from the centre of a brick. This fragment is first dried in an oven or retort until all water is expelled. It is then weighed and placed in a vessel containing water. At the end of a period of six to twelve hours the fragment is again weighed and is found to have taken up a certain amount of water. This amount is expressed in a percentage of the weight of the fragment and indicates the absorption of the brick.

(3) TRANSVERSE TEST.

This test is usually applied for paving brick or blocks, but is seldom used in connection with other work. It indicates the toughness of the brick, and is usually made by supporting the brick on its flat side on two knife edges six inches apart. A load is then applied centrally on the brick until the point of failure is reached.

Through the courtesy of Mr. F. G. Marriott, Engineer of Tests for the city of Toronto, I am able to supply herewith the average results of a large number of tests on paving brick of fifteen or twenty different brands.

ABSORPTION TEST—

Period of immersion, 6 hours.

Number of samples tested, 49.

Average gain in weight, 2.93 per cent.

ABRASION TEST—

Number of samples tested, 49.

Average loss in weight under 1,000 revolutions of rattler, 13.4 per cent.

Average loss under 2,000 revolutions, 21.6 per cent.

TRANSVERSE TEST—

Number of samples tested, 36.

Average size of blocks, 3½ inches by 4 inches by 9 2-3 inches.

Average breaking strength, 9,100 lbs.

Distance between supports, 6 inches.

The following statement shows the approximate cost of construction for several of the more important classes of pavements in Toronto.

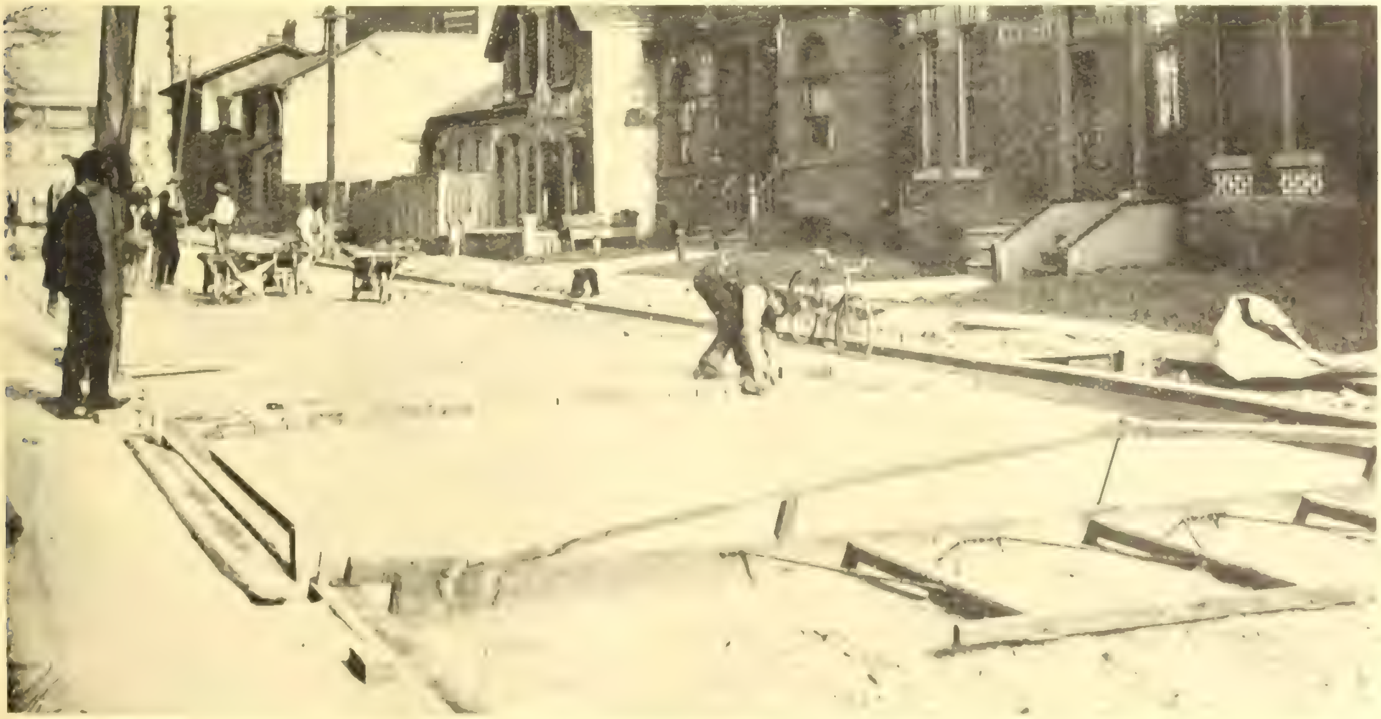
The figures are, of course, approximate only, and depend largely on local conditions.

Pavement and foundations.	Cost of Construction.	Nominal Life. Years.
Asphalt (heavy), 6-in. concrete..........	$2.00 to $2.25	10
Asphalt (medium), 5-in concrete........	1.75 to 1.85	10
Asphalt (light), 4-in. concrete...........	1.40 to 1.60	10
Bitulithic, 4-in. concrete	2.12 to 2.25	10
Brick (heavy), 6-in. concrete...........	2.60	10
Brick (light), 4-in. concrete............	2.40	10
Treated wood block, 6-in. concrete.......	4.00	10
Cedar blocks, sand	1.00	5
Granite block, 6 in. concrete...........	3.25	10
3-in. asphalt block, 4-in. concrete.......	3.30	10
4-in. asphalt block, 6-in. concrete.......	4.40	10

In considering the above figures it should be borne in mind that the repairs to the cheaper pavements are heavier than in the case of those more expensive, and that brick, when compared with other pavements, subjected to heavy traffic in business sections of large cities, stands most favorably in point of first cost and durability. Repairs are almost a negligible factor. Practically the only expense in maintaining the pavement is caused by tearing up the street for underground construction. The ease of making repairs in such case is a further recommendation in favor of brick.

Brick in Sewers.

Present conditions indicate that a large quantity of brick is required for the construction of sewers in Canada. Practically all egg-shaped sewers which are used in sewerage systems for



The Four Stages in Laying aBrick Pavement: 1. Concrete Base; 2. Sand Cushion; 3. Placing Bricks; 4. Grouting combined flow, as well as circular shapes up to five and six feet in diameter, are constructed in brick. For sizes of sewers two feet and under in diameter, vitrified tile pipes have an almost undisputed field. Clay products thus fill the need pretty thoroughly in the usual sizes of sewers constructed for towns and cities. Moderate sized circular sewers are now being built, not only of brick, but of concrete, reinforced concrete and reinforced concrete pipes as well, and after the sizes reach five feet in diameter, the economy and convenience governing the use of brick or any other material may depend altogether on local conditions. It is plain that in these larger sizes, the cost of excavation diminishes in comparison with the cost of masonry, whereas in the smaller sizes, the character of the excavation practically governs the cost of the completed sewer. Where sewers are built in tunnel, especially in the smaller sizes where headroom is a consideration, brick comes to the front as the most suitable and adaptable material for ordinary conditions. Not only can a greater speed in construction be attained, but the operation of excavating and constructing the masonry of the sewer can go forward alternately in the tunnel heading without any loss of time. The centres supporting the brick arch can be removed practically as soon as the arch has been completely turned, and connection between the heading and the shaft is maintained at all times. Soft ground, in fact all ground excepting solid rock, is apt to give trouble if left unsupported for even a few days. By the use of brick and by constructing the invert and arch for short distances at a time, most troubles in respect to bad roof are overcome, and frequently a large saving is effected in timbering.

Brick Sewer in Tunnel, Junction of Two Headings

Climatic conditions, especially in northern countries, are favorable to the selection of brick for constructing sewers in the winter, as much greater care must be taken in constructing and protecting a thin arch of concrete in the winter than in building a similar arch in brick. In very large sewers, say from seven to eight feet in diameter upward, concrete may perhaps be substituted to advantage in the arch and for backing behind the brick invert, where the work is done in open cut. This does not apply so readily with work done in tunnel.

Other Uses of Brick in Municipal Work.

There are many other uses to which brick is put in municipal improvements which have not been touched upon. The building of municipal conduits for service wires and pipes, the construction of manholes, the laying of sidewalks, all this must be taken into account, apart from the use of brick in municipal architecture.

Brick as a material for sidewalks and pavements, in fact, wherever it can be seen, is both durable and aesthetic. If it is placed underground, removed from the possibility of ordinary inspection, providing it has been properly selected and placed, there is that confidence in its durability and efficiency which lightens the load of responsibility on the shoulders of the overburdened construction engineer and contractor.

Moving the Front of a Brick Building

A large building of the Federal Sugar Refining Company, at Yonkers, N.Y., stands so close to the right-of-way of the railroad that the front interfered with the recent location of the fourth track, and it was proposed to tear it down and rebuild a wall with one end in the same position and the other end about five feet transversely from the original position. The building has steel roof trusses and floor beams supported on steel columns built into piers of the brick face wall 92 feet long, 30 feet high and 20 inches thick. The wall was supported on a continuous concrete footing, and was divided into panels 16 feet 8 inches long, between the centres of the columns. In the centre of each panel there is a door 7 feet wide, and above it are two windows and a cornice, while a steel canopy is bracketed to the face of the wall below the windows and protects the doors.

It was at first proposed to tear the wall down and rebuild it in the position, making, as above stated, a slight angle with the original position and intersecting it at one end. Inside of this wall an interior partition, with doors and windows corresponding to those in the wall, was to be built parallel to the original position of the wall and about 7 feet from it. The contractor decided that it would be more advantageous to move the wall than to tear it down and rebuild it. This modification was acceptable to the owners, and, according to the Engineering Record, the work was carried out rapidly and successfully.

Continuous 12 x 12-inch horizontal sills at the surface of the ground were bolted together through the wall from end to end, and 12 x 12-inch vertical timbers 30 feet long were bolted to the face of the wall on each side of each door, the bolts passing through the brick work and engaging wooden bearing pieces on the inner face of the wall. Horizontal turnbuckle rods 1½ inch in diameter were passed through the feet of the vertical timbers, with nut and washer bearings on their outer faces, and their opposite ends were secured to the interior steel columns. Similar 1-inch rods engaged the upper ends of the vertical timbers and were secured to the tops of the interior steel columns. The interior partition was built, the ends of the floorbeams were supported on shores in the plane of the partition, and the beams were cut off just beyond it and were provided with connection holes to fit the lugs of the columns, and the short ends were removed.

The new concrete footing was built in the required position for the new face of the building, one end of it intersecting the old wall and the other end being about 5 feet distant from it on centres. Horizontal concrete bridges or girders about 20 inches wide were built between the old and the new footings at the base of each column and midway between these points. Small holes were cut through the old footings just below the base plates of the column pedestals, and in them were placed horizontal 8 x ½-inch steel track plates, greased on top, seated on the concrete bridges and extending across the tops of the new concrete footings. Corresponding holes were cut through the brickwork in the centre of each panel, and similar track plates were placed in them on the concrete bridging with short bearing plates between them and the brickwork. The plates were wedged up to bearing and grouted underneath. After the grout had set the brickwork was cut through horizontally between the plates at the top of the concrete footings, thus throwing the entire weight of the wall on the sliding plates and providing a slight clearance between the footing and the brickwork. A horizontal piano wire was stretched tightly from end to end of the wall about 3 feet above the surface of the ground, and when all was in readiness the turnbuckles in the horizontal rods were operated by one or two men at each, and the wall was easily moved over to position on the new footing, being virtually revolved about a vertical pivot where the old and new footings intersected. Alignment was maintained by watching the piano wire and not permitting the wall to be pulled more than 1-8 inch away from it, while the verticality was easily checked by plumb bars. The upper part of the wall was fitted by 2 x 4-inch struts wedged up against the turnbuckle rods and shifted as necessary.

The work was done without interfering with the business carried on in the building and without obstructing the doorways through which heavy trucking was in contant progress. Sliding platforms or bridges were provided at each doorway, resting upon the floor in the interior of the building and on the moving door sill, and protected hand rails on each side. These offered no obstruction to the movement of the wall, and permitted the trucks to pass back and forth without interruption. The wall was moved from the old to the new position without any injury and without causing any cracks or breaking any glass. The movement of the wall required only about 4 hours, and it is estimated that this method of executing the work effected a large economy over the cost that would have been incurred by removing and rebuilding the wall.

The Use of Brick in Government Buildings

Turning back to 1867, the year of Confederation, we learn that the few buildings then the property of the Dominion consisted principally of stone structures, with a small number of brick buildings and less of wood. The Parliament Houses at Toronto and Quebec, the Government House at Quebec, the Toronto Custom House and the Port Dalhousie Custom House were of brick, the Parliament House at Quebec being of fire brick and the others of local brick. A number of buildings like the old post office at Toronto—later the Inland Revenue Offices—were brick on flanks and rear with stone fronts. In the Maritime Provinces none of the buildings acquired by the Dominion Government through the union of the provinces were brick, until the entry of Prince Edward Island into the Confederation, when the court house and post office, a brick building covered with stucco, became the property of the Government and which, when destroyed by fire in 1884, was replaced by the present elegant brick structure.

As the confederated provinces grew, the new buildings were principally of stone although some prominent examples such as the Toronto Examining Warehouse and Toronto Post Office were of brick. In the early days of Manitoba the Winnipeg post office, custom house, lands office and Lieutenant-Governor's residence at Winnipeg were of brick, as was the penitentiary at Stoney Mountain; while in later days the examining warehouse, immigration hall and Fort Osborne barracks were of like material.

The Lieutenant-Governor's residence at Regina and the penitentiaries at Prince Albert, Sask., and New Westminster, B.C., are of brick.

All the most important of the armouries or drill halls, with the exception of those at Montreal, Quebec, Kingston, and Brockville which are stone are built of brick Among the number are those at Toronto, London, Stratford, Brantford, Guelph, Ottawa, Peterboro, Regina, Sherbrooke, St. Johns (P.Q.), Three Rivers and Victoria. The Military Colleges at London, Ont., and St. Johns, P.Q., are of brick

A large number of the post office and Customs buildings in the smaller cities, towns and villages are of brick, many of them being of an ambitious character. Some of the most important are those at Charlottetown, P.E.I., Sarnia, Ont., Bowmanville, Ont., Brantford, Ont., Stratford, Ont., Peterborough, Ont., St. Johns, P.Q., and Levis, P.Q

Brick Paving at St. Catharines, Ont.

Contributed by MR. D. BENZIE, City Engineer.

The city of St. Catharines commenced the laying of permanent pavements in 1906. The material adopted for the first pavement laid was vitrified brick. The size of the brick used in pavement work in St. Catharines is 8½ inches long by 3½ inches wide by 3⅞ inches deep. The area of brick pavements laid in the city is 26,000 square yards. In 1906 the area laid was 17,000 square yards. Since then 9,000 square yards have been put down. The total area laid represents approximately one and one-half miles of brick paved streets.

St. James Street, St. Catharines, Ont.

All the brick pavements have been put down on business streets subject to very heavy traffic and up to the present time, with few exceptions, very little sign of wear is apparent, showing clearly that vitrified brick is an excellent material for this class of work. Of course it is essential that the very best brick should be used. The brick must be hard, tough, dense and impervious to water.

The bricks are laid on a concrete foundation 5 inches thick, and a sand cushion 1 inch thick, and the joints run in with a strong cement grout. Along the curb line is an expansion joint of asphalt, the width of joint being governed by the width of pavement. The usual width of joint is from 1 to 1½ inches.

William Street, St. Catharines, Ont.

The prices paid for brick pavements laid in St. Catharines, exclusive of excavation, with construction as above described, ranged from $2.17 per square yard in 1906, to $2.07 per square yard in 1909

Western Clays, a syndicate of Edmonton business men has been organized to develop the brick clay deposits at Strathcona. The construction of the necessary buildings is being pushed forward expeditiously. The machinery for the plant is being brought from England. The company expects to find a big market for terra cotta

The Ideal Paving for Streets and Highways

Vitrified Brick: Its Durability, Economy and Attractive Appearance Details of Construction—Noteworthy Examples of Successful Use

Specially contributed by W. P. Blair, Secretary National Paving Brick Manufacturers' Association

Not more so in other countries than in Canada is the subject of streets and highways discussed in its various phases and relationship to the public. Their utility, their economy in construction and maintenance, their comfort and satisfaction to the user, are phases receiving serious consideration, and more so now than at any time in the past. There was a time when mere convenience demanded immediate relief in some kind of street or highway that would answer merely for the occasion, but the demand of the present time must, to a very great extent, take into consideration the wants of the future.

The problems of road building have nowhere kept pace with the advancement of civilization in almost all other lines. It is true that the states of eastern Europe have had a system of maintenance, regardless of original construction, that has afforded in case of the much-used thoroughfares fairly satisfactory conditions, but in Canada and the United States the uses to which our streets and roads were subjected have been entirely revolutionized in the past ten years. There seems to be a universal insistence that larger and heavier loads shall be carried.

With highways it is the same as with railroads. It seems that yesterday a forty or fifty thousand pound capacity car was regarded as sufficient, but to-day such cars are being eliminated from use and eighty and one hundred thousand pound cars are taking their place. And so it is with the traffic upon our streets and roads. The advent of the automobile has had something to do with this. Trucks hauling from seven to fifteen tons are being exploited by automobile manufacturers, and accepted with avidity by commercial interests. With this situation confronting us, the demand is simply to build roads for the loads. In no other way is it possible to meet the advance of our commercialism. By what, then, and how shall this demand be met, from economical and financial standpoints? If any community has worked out a reasonable solution of this question, the manner and method by which such solution was accomplished, no matter where, should attract serious attention from all parties concerned. Probably no other place has met with such success in this particular as Cleveland, Ohio, and the adjacent country.

Brick paved street in Cleveland residential district

The material with which Cleveland's streets and roads are surfaced is vitrified brick. It is true that in such central states as Ohio, Indiana and Illinois ninety per cent. of all the pavements are laid with vitrified brick, but Cleveland, Ohio, and the vicinity afford a more noteworthy example of ideal roadway construction of vitrified brick than any other place in the world. Many of these streets and highways have been in use from ten to fifteen years, subjected to average and heavy traffic, without the expenditure of one single penny for repair. They are in such a state of preservation that their present value would reasonably be appraised at from ninety to ninety-five cents on the dollar.

Cities and communities following the example of Cleveland will find that new roads can be built with the funds that would otherwise be expended for maintenance. The cost of a road must always be reckoned by the expenditure for its original construction, to which must be added that which is expended for maintenance. If no maintenance charge is necessary, then the cost of a road is simply the original charge for its construction.

In what way has Cleveland furnished such a worthy example for imitation? First she has selected the material that is conceded to be the most durable for the wearing surface of her streets and roads. She has then seen to it that the brick road was so constructed that it should give to the brick the greatest advantage in resisting the wear and tear of travel. A strict adherence to certain simple rules were followed. Where natural drainage was not afforded the roadbed was carefully drained. Where the natural foundation of sand or gravel was not found, an artificial one of broken stone or concrete, finished to a smooth surface, was supplied. Upon this uniform surface was placed a compressed bed of 2-inch sand. Upon this sand cushion was laid, on edge a good quality of vitrified brick, sometimes of one size and sometimes of another. These were compressed, by a roller weighing not more than five tons, into this sand cushion, bringing them to level surface. The interstices of the brick were filled with a one to one mixture of Portland cement and sand. This mixture was applied so that this proportion of sand and cement was maintained in place—that is to say, the sand and cement were in equal proportion throughout every inch of the work. The details of construction were those laid down in the directions for construction published for free distribution by the National Paving Brick Manufacturers' Association of the United States. These directions followed carefully in detail will enable any other city to secure like results.

There are many instances where the cost of streets and roads, and that of their maintenance, exceeds the value of the property abutting the same. This is an economical condition that the tax-paying public must get as far away from as is possible. That such relief is to be found in the use of vitrified brick for paving purposes has been demonstrated beyond question. It cannot be regarded as experimental. The question has been fully and completely solved.

A striking example may be found in the construction and use of the Indianapolis motor speedway, a celebrated track built for racing purposes. In the first place, the promoters of the track had it constructed of bituminous macadam, and in the very first series of races after its construction the track was rutted and torn by the severe use to which it was subjected. Accident after accident followed, and seven people were killed. The Cleveland ideas of brick street construction were then adopted, and the great racing track, two and one-half miles in circumference and fifty feet in width, was constructed of vitrified brick. Race after race has followed. Record after record has been broken. The track has been subjected to the most severe tests and no accident has occurred during the race. The speedway remains intact, promising great durability unmeasured by years of use.

Nor are the foregoing all the advantages to be found in a properly constructed vitrified brick street. It originates no dust; no contamination of the soil underneath is possible from the offal to which the street is subject, and it is easy to clean. To its durability, comfort in use, and perfect sanitary condition must be added another advantage that should never be lost sight of in street construction:—its beauty. Nowhere in the world is to be found a residential district adorned with more beautiful streets than Wade Park, Cleveland.

All this is not suggestive theory, but facts as they exist, furnishing evidence entirely sufficient to persuade the investment of any large sum. Thousands of dollars of public money are being expended in streets and roads every year. Why not take advantage of the best investment?

Construction of Brick Pavement—Applying the Filler

Directions for Laying Brick Pavements

Directions for laying vitrified brick pavements have been printed in pamphlet form by the National Paving Brick Manufacturers' Association and may be obtained upon application to the secretary, Mr. W. P. Blair, Board of Trade Building, Indianapolis, Ind.

These directions, while comprehensive, covering every step in the process of constructing a high grade brick pavement, are clear, simple and direct, thus preventing all chances of mistake. They include directions under the following heads: "Substructure or Grading," "Curbing," "Marginal Curb," "Foundation," "No. 2 Paving Block Foundation," "Sand Cushion," "Brick," "Brick Laying," "Rolling and Tamping," "Expansion Cushion," "The Filler."

Unusual clearness is given these comprehensive directions by illustrations showing every step of the process. There are full-page photographic views showing work in actual progress. All those engaged in laying vitrified brick pavement, or interested in brick pavement, or pavement of any description, for that matter, should secure a copy of this valuable booklet.

Rattler Tests on Paving Brick

At the recent convention of the American Society of Municipal Improvements, Prof. Orton, of the University of Ohio, Columbus, O., gave a very interesting talk descriptive of some work designed to standardize rattler tests on paving brick. This work is being carried on in two independent series of carefully planned tests being made by Prof. Orton at Columbus, and by the National Paving Brick Manufacturers' Association at Indianapolis. So far as is humanly possible, the conditions surrounding the two sets of tests are absolutely identical. The two rattlers are identical in design and construction; a liberal number of brick is chosen from the product of various plants and divided into two equal parts and sent half to one laboratory and half to the other.

On the first series of tests it happened that one of the laboratories started in before the other. Notwithstanding the identical test conditions which it was supposed had been established, the results were widely divergent. It turned out on investigation that at the Indianapolis laboratory shot from a local foundry had been used on the first series of tests, instead of awaiting the arrival of the Indianapolis portion of the joint order for both rattlers. After the tests had been started up again, with shot from the same foundry, further divergence resulted, and on looking into the matter it was found that one foundry had sup-followed the specifications for the iron for the cubical and spherical shot—one being harder than the other. The lesson to be drawn from this experience is that minute attention must be given to every detail surrounding rattler tests of paving brick, in order to ensure comparable results. It may be added that the reason for entering upon this extensive series of tests was that since the standard rattler test of the Paving Brick Manufacturers' Association was adopted, some years ago, considerable complaint has been made that the results obtained in different places were not at all comparable.

Studies are being made to determine the best sort of material for rattler staves. To this end there are now being tried staves made of cast-iron, of channel-iron lined with steel, of manganese-steel and of three thicknesses of steel plates: ¼, ½ and ¾-inch.

Before the tests were concluded, they will run into thousands in number and several carloads of brick from many manufacturers will be tested. Only one product will be used until a given series is run out. The revolution speed of the rattler will be kept uniform within a very slight variation. It is hoped that altogether the irregularities in the rattler, the shot, etc., can be so reduced as to bring everything within 1 per cent. of variation from uniformity.

Construction of Brick Pavement—Applying the Filler, Finishing coat

Prof. Orton remarked that if brick will stand the rattler test, he cares nothing about the cross-breaking or absorption tests. It was brought out in the discussion that the standard brick specifications adopted last winter by the organization of city officials which met at Chicago, eliminated all tests except the rattler test and the absorption test.

The name of the Brandon Brick & Lumber Co., Ltd., (manufacturers of sand lime brick) has been changed to the Brandon Sand-stone Brick Co., Ltd.

The Two Big Bills

Specially Contributed by J. A. Riddell de Cobb

BRICK WORKS, like all other industries, come generally under one of three classes: First there is the large corporation, backed with ample capital, directed by clear-headed business men and managed by practical and technical officers. Second, there is the smaller company, generally comprised of a group of men who, having other callings and a few hundred dollars each with which they are anxious to take a "flier," have credit enough at the local bank to give them what they consider a start. The management in this case is generally entrusted to some man whom one of the shareholders knows "to know all the tricks," or else to one of themselves, who perhaps has spare time on his hands, is a good fellow, and, having made a success of some other line, is admitted to have head enough to "run a brick-yard." Under this class might also be included those men who have chosen brick-making for their calling, and the sons or creditors of the third class, who are tired of the "old man's" methods—or rather lack of them.

The third class is made up of the cross-roads farmer brick-maker, who "runs" work just as his predecessors have done for generations—works the farm week about with the yard—votes the way his father and grandfather did, knows the whole thing, and manages some way or other to keep the interest on his mortgage paid.

The first class, managed by the experts, do not need general help—their officers attend conventions, study trade papers, compare notes and watch for improvements. The third class would scornfully refuse it. But the parties of the second part need such help, are looking for it and deeply appreciate it.

But they all have two big bills—Labor and Fuel. The total of these items causes nearly all managers to break the third commandment, and the municipal ordinance against profane language. It is a hard thing to see a superintendent, who has a reputation as a class leader, jumping on his hat and trying to swear in iambic tetrameters. The labor problem is the result of changing conditions. "The same old gang" that used to be depended on year after year, who knew their job, and whose weaknesses were so well known that they could be provided for, have disappeared, and are being replaced largely by immigrants and floaters. Many of these never consider either their own or their employer's interests and seem incapable of appreciating the fact that the one embodies the other. Arranging gangs for piece work is out of the question in some localities, owing to the irregular and careless habits of the available labor. A yard foreman cannot possibly move from one place to the other quickly enough to keep the gang going either steadily or correctly. In trying to do so, he uses so much foot energy that he has no opportunity to study his work intelligently.

Value of Sub-foremen

The change in conditions has come so rapidly that the ordinary superintendent has had no chance to adapt himself to them, but the astute managers of large industries have a system that is worthy of every brickmaker's consideration—viz., the uses of sub-foremen or straw-bosses. It may be applied first in the clay pit by selecting the best digger and giving him an advance of about ten per cent. to keep the rest busy and to follow the foreman's directions. The foreman may then visit his bank once through the morning and once through the afternoon, lay out his benches and give this man instructions enough to carry on his work until his next visit. Then, if he comes on next morning and finds one or more men off, he can supply green hands (perhaps) and leave them to the pit boss. The same idea can be carried out by giving the moulder a "stripe," and further, by selecting a good hand at the kiln end.

Large yards necessarily have to have departmental heads, but the medium sized operator, who has always handled his yard piecework, or had a regular gang, cannot understand why he has to have several bosses, when a year or two ago he did not need any. However, it has its redeeming feature. It tends to the selection and building up of the best class of men and in these degenerate days of no-apprenticeship, it looks like the best way to provide capable men for the future.

While the fuel bill is not so large, it really appears larger, because it is not paid out like wages, but in large accounts. The place to start saving on this bill is at the power house, and the best way to start is by retaining a consulting engineer. Boiler insurance companies will insure a boiler for $5,000 for three years for $50, and generally speaking will give more than the value of the premium paid within three hours, if their advice is appreciated and intelligently followed. Yards of the first class depend on their chief engineer and would smile sweetly on any inspector who tried to give them a pointer. Most of them have another guess coming. The head engineer may be a very capable man, but very seldom has he had the chance to study the different plants that an inspector has had, or to gather up so many good points. The yards of the third class are either run by horse power, or by an ancient boiler and engine, coated with dirt and grease, leaking steam everywhere, and held together with hay-wire. The boss of this yard would not tolerate an inspector for an instant.

The Sphere of the Inspector

Yards of the second class are the ones that really appreciate the inspector. A good inspector has been known to effect a fuel saving of hundreds of dollars a year, with an expenditure of about five dollars—things too simple for the "chief" to see.

A power plant in a brickyard should be run without any sign of waste, either from the stack or exhaust pipe. Start with the boiler and find out which is the cheaper—wood or coal. In some parts of Northern Ontario soft coal costs from $6 to $7 per ton, and even at that costs considerably less than wood. Should coal be decided on, buy the heat unit. A cord of sound dry maple is worth more than a cord of punky pine, and so is a ton of good coal better than a ton of cheap coal. And the difference of costs between the good and the bad coal is only a fraction of the difference between good and bad wood. Whichever you use, give some thought to getting the fuel to the boiler. If wood, use the trucks with detachable shafts; and if coal, use dump carts.

Next, take hold of the boiler and get information about the Dutch oven. It is worth considering. Build your boiler high enough (you can't build it too high), and if you are burning wood, use the V-shaped fire box, which by rolling the wood to a narrow grate, will in itself reduce your wood bill to an extent that will surprise you. If burning coal, use the coking system of firing, and start covering the grates by putting fire-brick flat along both sides and the back. Ninety per cent. of the fireboxes will stand this treatment. Take every opportunity to keep adding bricks, first the nine-inch way and then the four-inch way, until it is evident that this is being overdone. Then come back half a brick, and if the engineer is watching this movement intelligently he will have a much easier time and your fuel bills will be lighter.

Assuming that the yard has a good engineer, there will be no steam leaks, but it is safe betting there is a surplus of bends, bushings and other fittings that could profitably be dispensed with. The same engineer will have a well set up and quiet running engine, but the exhaust steam must be saved. If dryers are used, every particle can be condensed in the coils, and the live steam needed can be so regulated that it is all used. Watch the steam trap. The levelling of one recently raised the heat of a dryer over 20 degrees. Conduct the condensation from the trap to a receiver to which is connected the boiler feed pump, controlled by a float valve in the receiver. If properly set up, there should be no loss of exhaust steam, and the water can be fed into the boiler at times as high as 112 degrees.

Kiln fuel is a subject for kiln builders to discuss. No yard can expect to get out of the elementary stage without adopting a permanent system of kilns, and let the advocates of the different types show their saving.

Consulting Engineers for the Industry

It does seem a pity that the ceramic industry does not afford a consulting engineer—one who could advise how to work the banks, what kind of a machine best suits certain clays, the dryer most adaptable, and lastly the most profitable kiln to build. At present we are dependent on the agents of some of the other machinery firms, and although good fellows, they naturally have to secure orders for their own product. The average foreman is not competent to distinguish the good and bad points of machines and appliances he has never seen. Many thousands of dollars are thus wasted annually on installations which are not the best adapted for the work they have to do. The machine that is suitable to one stratum of clay may be a dismal failure in another. The same may be said of dryers and of kilns. As was stated, it is necessary to try out everything at least once to learn its value.

A good man would save a lot to the industry, but his time is not yet. The big yard man knows it all, the small yard man's father knew it all, but the small investor generally finds out (after some years) that he knows nothing about it, and cannot get in touch with anyone who does. We look to see the time when there are enough yards of the second class in Canada to guarantee some capable man in opening an office.

The Citizens' Association of Montreal have sent a communication to the Board of Control urging a more efficient inspection of new buildings erected in the city.

Building permits for the year at Vancouver, B.C., will total 13 million dollars, according to the prediction of Building Inspector Jarrett of that city. The twelve-million mark has already been reached.

Brick Masonry in the Light of Recent Tests

Commendable Enterprise of Canadian Manufacturers—Results of Experiments Made in the Laboratory—The Need for a Revision of the Building Code Exemplified

Specially Contributed by Peter Gillespie, Department of Applied Mechanics, University of Toronto

Few, if any, of the constructive arts have a more venerable history than that of brick making. "Begun in prehistoric days when primitive man fashioned the clay and baked it in the sun; developed and improved with the accumulated experience of succeeding ages and perfected in recent times through the investigations of the ceramist and the chemist, the brick-maker's art commands a respect and possesses a prestige analogous to that which attaches to an old and honorable family." The product has been tested and proved through use in all ages and for it there will always be a demand. Especially have Canadian manufacturers shown a commendable enterprise in keeping pace with a progress that insists on an article, structurally and artistically, the best that skill can produce. In these two particulars, the products of our best Canadian plants are not surpassed in America, and, in this expanding period of Canada's history, the outlook is particularly bright. For the further development of this and related industries, a school of ceramics would be of invaluable assistance, and it is hoped that steps, already taken, looking toward its establishment, will not have been in vain.

There have been conducted in the testing laboratory of the Faculty of Applied Mechanics of the University of Toronto during recent years, a large number of crushing tests on brick and brick piers. In the case of the latter, the age, the mortar jointing, the quality of bricks and the height have been various and, in consequence, the results show the influence of a large number of variables. These results and others that are available, have been examined with a view to reaching some generalizations regarding the strength of brick masonry and the permissible stresses to which it may be subjected. The results of some of these experiments are appended.

The physical tests ordinarily conducted on brick in a laboratory are the crushing test, the cross-breaking test, the rattler test and the absorption test. The two first mentioned enable us to judge the fitness of the brick to resist direct and bending stresses, the third is intended to be a criterion of its capacity for wear and abrasion and the last a measure of its hardness, its durability and the completeness of the burning. The modulus of rupture, as found from the cross-breaking test, while determining neither the tensile nor compressive strength, is doubtless a function of both and a means of comparing classes and individual bricks. As in all granular materials, the modulus of rupture, numerically, lies between the tensile and compressive strengths. That there is some relation between the porosity and the crushing strength is generally conceded, for when the absorption is high the strength is likely to be low. The truth of this statement is evidenced from the following table of results taken from the report of Tests of Material collected at the Louisiana Purchase Exposition, St. Louis, Mo., 1904.

Brick	Absorption.	Strength pds. per sq. in.
Dark buff	6.2%	8,620
Common red	13.9%	4,700
Light red, face	20.4%	3,050
Dark red, paver	3.5%	11,990
Light gray, sand lime	13.2%	5,280

That there are glaring exceptions to this general rule is proven by an examination of almost any considerable number of results of tests on the resistance of brick to compression. Of the tests enumerated above, the crushing is probably the most frequently made. The strength is quite variable, running from 1,000 pds. per square inch for inferior clay bricks, to 16,000 pds. per square inch for vitrified pavers, ordinary clay brikes averaging 2,000 pds. per square inch. Mr. James Howard reported in the Proceedings of the American Society for Testing Materials, a test conducted by him at the Watertown Arsenal, in which the crushing strength exceeded 38,000 pds. per square inch. The brick was a vitrified shale manufactured by the St. Louis Vitrified and Fire Brick Company. Our concern in the present article is, however, largely with brick masonry and those things which contribute to its strength. Next to the brick itself is the quality of the jointing. A strong mortar employed with weak bricks, or weak mortar employed with strong bricks, is an unwise combination where strength of masonry is a "sine qua non." Of the two, the latter is of more frequent occurrence. The ideal condition would occur with a mortar jointing whose elastic properties and crushing strength are identical with those of the brick. The structure would then be a homogeneous monolith, with the exception that it would have transverse planes of weakness. The condition, however, is probably never attained and in the general case the strength and rigidity of the brick are of small importance since the mortar is the weaker member. The following table of results from the Watertown Arsenal Report for 1904, shows that the strength of a pier may sometimes be as great as 45 per cent. of the strength of the brick, but ordinarily is much less than that. The influence of the ratio of height to diameter was probably present in the tests recorded. The piers were 12 inches by 12 inches by 8 feet high. Three kinds of mortar were employed, viz., neat Portland cement, a cement and sand mortar, and a cement and lime mortar.

Pier.	Jointing.	Age.	Strength of Pier, pds. per square in.	Strength of Brick, pds. per square in.	Strength of Pier in terms of Strength of Brick.
Face, dry-pressed	Neat Cement	1 mo.	2,880	9,490	.30
do	1 C: 3 S	6 mo.	2,400	9,490	.25
do	1 L: 3 S	6 mo.	1,517	9.490	.16
Face, repressed	Neat Cement	6 mo.	1,925	6,780	.28
do	1 C: 3 S	6 mo.	1,925	6,780	.28
do	1 C: 3 S	6 mo.	1,670	6,780	.24
do	1 L: 3 S	6 mo.	1,260	6,780	.18
Face, wire cut	.Neat Cement	6 mo.	4,021	13,720	.29
do	1 C: 2 S	1 mo.	2,410	13,720	.18
do	1 L: 3 S	6 mo.	1,420	13,720	.10
Hard, W. Cambridge	Neat Cement	1 mo.	4,700	10,490	.45
do	1 C: 3 S	1 mo.	1,800	10,490	.17
do	1 L: 3 S	6 mo.	994	10,490	.09
Light Hard W. Cambridge	Neat Cement	1 mo.	1,510	7,090	.21
do	1 C: 3 S	6 mo.	1,519	7,090	.21
do	1 L: 3 S	6 mo.	732	7,090	.10
do	1 L: 3 S	5 mo.	809	7,090	.11
Hard, East Brookfield	Neat Cement	6 mo.	1,969	4,840	.40
do	1 C: 3 S	6 mo.	1,800	4,840	.37
do	1 L: 3 S	6 mo.	733	4,840	.15
do	1 L: 3 S	5 mo.	866	4,840	.18
Light Hard, East Brookfield	Neat Cement	6 mo.	1,061	4,470	.24
do	1 C: 3 S	6 mo.	1,224	4,470	.27
do	1 L: 3 S	1 mo.	465	4,470	.10
Hard, Mechanicsville	Neat Cement	6 mo.	1,400	5,810	.24
do	1 C: 3 S	6 n.o.	1,411	5,810	.24
do	1 L: 3 S	6 mo.	718	5,810	.12

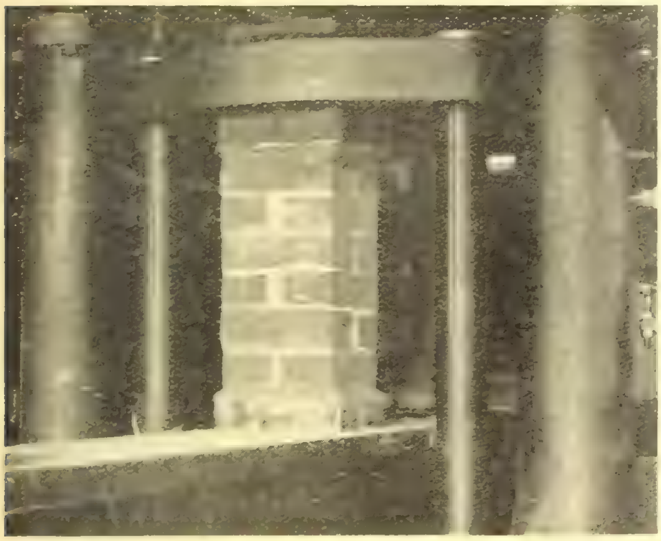
From the above, we obtain the following averages:

Strength of pier in terms of strength of brick:—

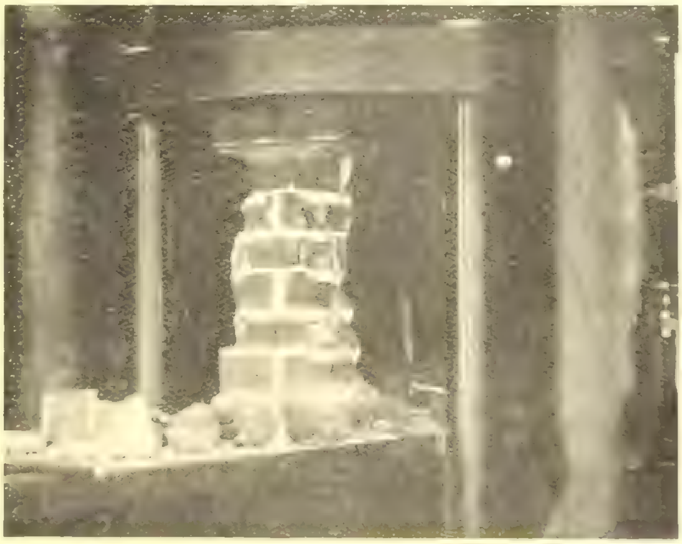
When laid in neat cement.................. 30 per cent.
When laid in cement mortar................ 25 per cent.
When laid in lime mortar.................. 13 per cent.

The manner of failure, shown in the accompanying photograph, is typical. At first, longitudinal rupture of the pier always occurs, occasioning the transverse splitting of the individual bricks. This shows that the tensile strength of the brick is really of very much importance.

There was published in the Transactions of the Association of Civil Engineers, Cornell University, 1900, the results of a series of tests made on brick piers 13 inches square and 80 inches in height, the jointing being a 1 : 2 cement mortar. It was shown that a wire netting laid in every horizontal joint increased the crushing strength of the pier 53 per cent, and when laid in every second joint, only 10 per cent. Iron straps in every fourth, sixth and eighth joint reduced the strength from 17 to 20 per cent. With solid steel plates in every fourth joint, the strength was reduced 7 per cent. The surprising thing about it all is the simplicity of the most efficient method.



Brick Pier Before Testing



Brick Pier After Testing

A comparison of costs for piers similarly laid is interesting. Brick work laid with ⅜-inch to ½-inch joints requires ⅓ cubic yard of mortar per cubic yard of masonry. If we assume lime at 30 cents per hundred pounds, sand at 50 cents per cubic yard, cement at $1.50 per barrel, and labor at current rates, we will find the prices of mortar to be substantially as follows:

Lime one, sand three...............$1.75 per cu. yd.
Cement one, sand three............. 3.93 per cu. yd.
Neat cement .... 11.60 per cu. yd.

If the cost of the lime and brickwork be assumed to be $8.50 per cubic yard, that of cement and brickwork will be $9.23, and of neat brickwork, [illegible] per cubic yard. The relative costs will be

Brickwork laid in lime mortar, 109.
Brickwork laid in cement mortar, 109.
Brickwork laid in neat cement, 139.

From this, it would appear that for the prices assumed, an increase in cost of 9 per cent. through the use of Portland cement will give an increased strength of 92 per cent., and that from an increased outlay of 39 per cent. the strength is augmented to the extent of 131 per cent. These are ample returns indeed and if strength be a desideratum, the use of Portland cement in the mortar jointing is an economical method by which to secure it. Outside of experimental laboratories, neat cement mortar is almost never used. Moreover, mortars high in cement do not trowel as freely as those containing lime. In cases where working stresses are low, and where water is not likely to be encountered, the lime mortar jointing will commend itself, because of its cheapness.

From the tests on Canadian products, whose results are appended, it will be seen that the average crushing strength of brick masonry laid in lime mortar is 67 tons per square foot, and when laid in cement mortar, 122 tons per square foot. The Toronto building by-law gives as the permissible stress for

Kiln run brick laid in lime mortar, 3 tons per square foot.
Ordinary brick laid in cement mortar, 5 tons per square foot.
Hard brick laid in lime mortar, 6 tons per square foot.

On page 37, of the same code, the permissible load per square foot for different kinds of soil, is given as follows:

Gravel and coarse sand, well cemented...... 8 tons.
Dry hard clay .... 4 tons.
Sand, compact and well cemented .... 4 tons.

Apart altogether from the evidence of tests, does it not seem preposterous that a "well compacted sand" should be capable of sustaining more load per unit area than any kind of brick masonry however poor, or that a "well cemented gravel" should have a sustaining power of nearly three times that of the latter?

The building codes of several American cities give the following as permissible stresses in tons per square foot for brick masonry:

Hard Burned Brick laid in	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Portland Cem. Mor..	18	15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cement Mor. & Lime	1[illegible]	1[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lime Mortar	8	[illegible]	[illegible]	[illegible]	11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

In the light of tests and the precedents of other cities, Toronto's code relative to the stresses on brick masonry could be, with profit, revised. It may not frequently occur that the permissible stresses in the masonry will be the governing factor in the dimensioning of the structure, but when such is the case, the discrimination against [illegible] material is [illegible].

Below are given results of a few tests on piers, conducted in the testing laboratory of the Faculty of Applied Science at the University of Toronto [illegible] elsewhere.

Pier No. 1:

Description.—The pier in question was built in December, 1904. It consists of [illegible] brick, best quality, built in 8 courses and laid in 3 : 1 cement mortar. The joints were ½ inch thick.

Size, 8½ inches by 8½ inches; area 72.25 square inches.

Height, 2 feet.

Ultimate load, 184,150 pounds.
Crushing strength per square inch, 2,550 pounds.
Crushing strength per square foot, 183.5 tons.

Pier No. 2:

Description—This pier was tested in January, 1906. It consisted of Carlton 2nd class brick, built in 6 courses, laid in 2 : 1 lime mortar. The joints were ⅜ inch thick.
Size, 8½ inches by 8½ inches—area 72.25 square inches.
Height, 16 inches.
Age, 6 years.
Ultimate load, 75,150 pounds.
Crushing strength per square inch, 1,040 pounds.
Crushing strength per square foot, 74.4 tons.

Pier No. 3:

Description—This pier was tested in January, 1906. It consisted of Kingston Road 2nd class brick, built in 5 courses, in 3 : 1 cement mortar. Joints ⅜ inch.
Size, 8¾ inches by 8¾ inches—area, 76.56 square inches.
Height, 14 inches.
Age, 1 month.
Ultimate load, 117,200 pounds.
Crushing strength per square inch, 1,530 pounds.
Crushing strength per square foot, 109.4 tons.

Pier No. 4:

Description—The pier in question was tested in January, 1906. It consisted of Carlton brick, 2nd class, built in 6 courses and laid in 2 : 1 lime mortar. The joints were ⅜ inch thick.
Size, 8½ inches by 8½ inches—Area, 72.25 square inches.
Height, 1 foot, 5 inches.
Age, 6 years (built in 1900).
Ultimate load, 75,000 pounds.
Crushing strength per square inch, 1,040 pounds.
Crushing strength per square foot, 74.9 tons.

Pier No. 5:

Description—The pier in question was tested in December, 1907. It consisted of Yorkville brick, 2nd class, built in 5 courses and laid in 2 : 1 lime mortar. The joints were ⅜ inch thick.
Size, 8¾ inches by 8¾ inches—Area, 76.56 square inches.
Height, 1 foot 2½ inches.
Age, 2 years.
Ultimate load, 106,000 pounds.
Crushing strength per square inch, 1,382 pounds.
Crushing strength per square foot, 99.5 tons.

Pier No. 6:

Description—This pier was tested in January, 1908. It consisted of Kingston Road 2nd class brick, built in 5 courses, laid in 3 : 1 cement mortar. The joints were ⅜ inch thick.
Size, 8¾ inches by 8¾ inches—Area, 76.56 square inches.
Height, 1 foot, 2½ inches.
Age, 2 years.
Ultimate load, 87,000 pounds.
Crushing strength per square inch, 1,140 pounds.
Crushing strength per square foot, 81.43 tons.

Pier No. 7:

Description—The pier in question was tested in January, 1908. It consisted of 5 layers of Humber brick, 2nd class, laid in 2 : 1 lime mortar. The joints were ⅜ inch thick.
Size, 9 inches by 9 inches—Area, 81 square inches.
Height, 1 foot, 2½ inches.
Age, 2 years, 1 month.
Ultimate load, 43,000 pounds.
Crushing strength per square inch, 531 pounds.
Crushing strength per square foot, 38.2 tons.

Pier No. 8:

Description—This pier was tested in March, 1908. It consisted of Kingston Road 2nd class brick, built in 12 courses, laid in 2 : 1 lime mortar. The joints were ⅜ inch thick.
Size, 8¾ inches by 8¾ inches—Area, 76.56 square inches
Height, 2 feet, 10 inches.
Age, 12 years.
Ultimate load, 67,200 pounds.
Crushing strength per square inch, 878 pounds.
Crushing strength per square foot, 62.71.

Pier No. 9:

Description—This pier was tested in March, 1908. It consisted of Carlton 1st class brick, built in 6 courses, laid in 3 : 1 cement mortar. The joints were ⅜ inch thick.
Size, 8¾ inches by 8¾ inches—Area, 76.56 square inches.
Height, 1 foot, 4 inches.
Age, 2 years.
Ultimate load, 74,600 pounds.
Crushing strength per square inch, 2,281 pounds.
Crushing strength per square foot, 163.94 tons.

Pier No. 10:

Description—This pier was tested in March, 1908. It consisted of Don buff pressed brick, built in 4 courses, laid in 3 : 1 cement mortar. The joints were ⅜ inch thick.
Size, 8⅝ inches by 8⅝ inches—Area, 74.4 square inches.
Height, 11 inches.
Age, 2 years.
Ultimate load, 75,000 pounds.
Crushing strength per square inch, 1,008 pounds.
Crushing strength per square foot, 72.00 tons.

Pier No. 11:

Description—This pier was tested in March, 1908. It conssited of Kingston oRad 2nd class brick, built in 5 courses, laid in 2 : 1 lime mortar. The joints were ⅜ inch thick.
Size, 8¾ inches by 8¾ inches—Area, 76.56 square inches
Height, 14 inches.
Age, 2 years.
Ultimate load, 59,000 pounds.
Crushing strength per square inch, 772 pounds.
Crushing strength per square foot, 55.14 tons.

Efflorescence on Brick Work*

By A. F. Greaves-Walker†

COMPOSITION OF EFFLORESCENCE.—Wherever brick are used for building purposes, brick walls will be noted which are covered or partially covered with a film of scum. This scum is generally white, but may be yellow or green. It appears at its worst on red brick walls, but may be seen more or less plainly on brick of any color. When the walls are new it appears as white blotches at various places. Later it may come out all over the building, giving the brick work a faded or dirty appearance. In a few years a red brick building so affected will take on a faded pink appearance which will stay with it forever.

The scum is simply a film of soluble salts carried from the interior of the brick to the surface by the water which they absorb, and left there after it evaporates. The scumming is always worst near the eaves and downspouts, and under the window-sills and water table. This is caused by leakage of rainwater between the roof and trough and from the downspouts, and through the catching of the water by the sills and water table which consequently soaks into the brick beneath.

The scum is generally composed of sulphates, although it may be composed of any other soluble salt. Chlorides are found in seacoast clays and alkalies in clays of the Western arid region. In the clays of this country, the scum causing salts, in order of their abundance are: (1) calcium sulphate; (2) magnesium sulphate; (3) potassium sulphate; (4) sodium sulphate; (5) ferrous sulphate; (6) aluminum sulphate.

Often all of these occur in a single clay, especially if it has been weathered and subjected to the attack of decomposing pyritiferous minerals.

---

*From a paper in the "Journal of Industrial and Engineering Chemistry" of the American Chemical Society.

†Salt Lake City.

CAUSES.—All of the above salts are very soluble except calcium sulphate, which is soluble 1 : 400. But this is great enough to completely ruin face brick in which it occurs, as the surface is small in comparison with the weight. This particular salt, in fact, is probably responsible for half the ruined walls in this country. The sulphates of soda, potash, and magnesia will often cause scum when present in the most minute quantities. As little as 0.01 per cent. of any one of these salts has been known to ruin face brick.

There are four ways in which salts are incorporated into the brick: (1) Soluble salts in the clays or other materials used; (2) soluble salts in the water used for tempering the clay; (3) soluble salts formed in kilns by oxidation of minerals in clay, or by reaction of sulphurous kiln gases on clay; (4) soluble salts introduced into brick after burning, principally from mortar.

A great majority of clays contain soluble salts, some large quantities, others but a trace. Surface clays are more likely to have a high content than the older deposits. Trouble is encountered in all parts of the world from this source, and probably 75 per cent. of the scumming comes from this cause.

Often materials are mixed with clays that carry soluble salts into them. Examples of this are the brick made around London, England, in which ashes are used to reduce shrinkage, and brick made along the Hudson, in which coal slack is used to aid in burning. In both of these cases the soluble salts in coal add to, if they do not entirely produce, the scum.

In the clays that vitrify, scumming can be overcome by burning them to a vitrified body, in which case the salts form silicates and become harmless.

The water used for mixing and tempering mud brick often contains soluble salts. This, of course, produces the same effect as if the clays contained them. Many good clays are injured in this way.

The formation of soluble sulphates in the kiln is a very common trouble. It is often encountered with clays that contain practically no troublesome ingredients before being fired. In many cases there is really no excuse for trouble at this stage. It is simply a case of ignorance on the part of the brickmaker or poorly designed kilns and stacks. When a kiln is set and the heating-up process is started, the ware contains considerable moisture. If good judgment is used and the fires are kept at such a stage that only so much of the moisture is being driven off as the sluggish draft of a cool stack will carry, trouble is not likely to occur; but if the moisture is driven off more rapidly than the stack can handle it, it is precipitated on the ware again, when it absorbs sulphur from the gases and forms sulphuric acid. This acid attacks the carbonates and other less soluble salts and forms soluble sulphates.

There is no doubt that considerable trouble is caused by the mortar in which the brick are laid. Poorly mixed mortar is dissolved by the rain water and the salts carried into the brick, only to be brought to the surface later. It is therefore always important to take great care with the mortar.

METHODS OF OVERCOMING SCUM.—Many methods are employed to overcome or prevent scum. It is possible to do this in nearly every case, but it is often impracticable on account of the low selling price of the ware. Where facing brick or other wares are made by the wet process or where the ware is vitrified there is practically no excuse for trouble.

The preliminary treatment is the principal method of overcoming or preventing scum. This is done by treating the clay or treating the water used.

TREATING THE CLAY.—Clays that contain soluble salts can be washed before using and the salts leached out. This may be done by treating piles of clay, after mining, with water and then allowing them to dry. This method is only possible where high-priced ware is made. Clays are often allowed to stand in piles for from six months to a year, in which case the rain and snow do the same thing.

In many clays the above methods will only cause the trouble. This would be the case where a clay did not contain soluble salts originally, but upon exposure to the weather insoluble salts were converted into soluble salts. This would be the case with pyritiferous clays.

Chemical treatment is very often resorted to. This is accomplished in clays made up by the wet process, by adding, to the water used, such chemicals as will precipitate the soluble salts and form harmless by-products, such as barium sulphate. Barium salts are the favorites with which to accomplish this reaction, but others can be used; barium chloride and carbonate are most commonly used.

In case soluble sodium compounds are present, the addition of the above-mentioned barium salts would form either sodium carbonate or chloride, both of which are soluble. However, they are so soluble that they would be readily washed from the surface of the ware by the rain, as soon as they formed.

According to Gerlach, a clay containing 0.1 per cent. calcium sulphate, which is 0.4 gram per pound, would require 0.6 gram of barium carbonate to perform the reaction. However, 6 or 7 grams should be added to every pound of clay for safety. This would mean practically 100 pounds per 1,000 brick. If barium chloride is used, but 26 pounds, are required per 1,000 brick. However, when this is used, close to the theoretical amount must be added, for if added in excess it will form a scum itself.

This method cannot, of course, be used in the dry press process, where no water, or at least very little, is added, as the barium or other salts must be used in solution to do the required work.

TREATING THE WATER.—When it is necessary to use a water that contains injurious soluble salts, it is simply necessary to precipitate them before adding the water to the clay. Many good clays are being ruined by bad water, when it needs but a few hours of a chemist's time to rectify the trouble.

CORRECT DRYING.—If ware containing soluble salts is placed in a drier and allowed to sweat slowly, the chances are all in favor of scummed ware, whereas, if the water is carried away from the surface of the ware as fast as it appears this will not often be the case.

It is a remarkable physical fact, not yet fully explained, that where a clay contains soluble salts, they are not deposited on the surface at all, or at least to a less degree, where the drying is steady and rapid, than where it is slow and discontinuous. It seems that rapid drying causes the water to come through the pore channels of the clay as through a filter and a sort of osmosis is set up, by which the saline matters are retained inside the mass of clay, while the water escapes as vapor from the outside. But where the drying is slow the salts get through this barrier and arrive on the surface plentifully.

It is therefore only necessary that brickmakers, in order to avoid trouble from this source, build good driers and install in them hygrometers by which their operation can be controlled.

Many other methods are used to prevent this trouble; some of them, however, have but temporary effects. One of these is to paint the surface of the scummed ware with oil, which for the time being covers up the scum. This is really practising a fraud, for while the ware does not show scum when put into the building it shows up as soon as the oil evaporates.

Another method is to paint one surface of the unburned brick with a heavy oil or tar. This prevents evaporation from that surface, the salts being carried to the other surfaces. The oil or tar is burned off in the kiln, leaving a clean face. This, too, is only temporary unless the brick is vitrified, as otherwise the salts will be drawn to the clean surface after a few soakings.

Notes on the Clay Resources of Ontario

Unlimited Supplies of Red and White-Burning Clays in the Eastern and Western Portions of the Province Respectively—Comparative Analyses

Specially Contributed by M. B. Baker, Professor of Geology, School of Mining, Kingston, Ont.

In response to a request by the editor for a paper on the above topic, I submit a few observations made while preparing a report for the Bureau of Mines on ''Clays and the Clay Products of Ontario.''

I know of no raw building material that is now receiving more attention than is clay, since it lends itself to such a variety of uses. We might define ''clay'' popularly as follows: Clay is an earthy material which, when moistened, becomes plastic, and can then be moulded into any desired shape, which shape is preserved intact upon drying. Furthermore, if heated to redness, the substance fuses, and on cooling assumes a rock-like consistency. From this definition we see that clay has several essential qualities and cannot easily be confused with any other material.

If we wish, however, to define clay more specifically and to deduce its origin, we would say it is a hydrated silicate of aluminium, with the chemical formula $Al_2O_3.3SiO_2.2H_2O$, and owes its origin chiefly to the decomposition of the mineral feldspar, which is such a common constituent of nearly all our igneous rocks. Clay is therefore strictly a decomposition product of rocks.

Deposits of pure clay, the direct results of rock decomposition, are practically unknown in Ontario, or in Canada for that matter; because very recently, geologically speaking, a series of glaciers, passing in a southwesterly direction over Ontario, removed, not only all the products of rock weathering, but also considerable thicknesses of the fresh rocks themselves. As a result of this action, enormous heaps of glacial products, varying from the largest blocks and masses of rock, to the very finest of rock flour, are found everywhere as our soil covering. Such mixed material is familiarly spoken of as boulder-clay (Fig. 1).

In many places this boulder-clay was deposited in the presence of water, which served to sort the materials to such an extent that we get beds of gravel, or sand, or clay, which are comparatively free from other materials. Such clay beds are suitable for the manufacture of clay products. The best known deposits of this character are the so-called blue-clay or hard-pan, with which most people are more or less familiar. It is usually called ''Erie'' clay because first studied along the north shore of Lake Erie and found to extend right across the country to Lake Huron.

If a line be drawn roughly from Prescott, on the St. Lawrence river, in a northwesterly direction through the towns of Perth, Ottawa and Arnprior, then, turning westward, through Pembroke, Bracebridge, Walkerton, to Lake Huron, it will divide Ontario into three areas, in which the surface clays will be distinctly different. In the southwestern area will be found the ''Erie'' clay with its weathered top layers, the ''Red Top'' clay. In the eastern area we will find the ''Leda'' clay, while in the whole of northern Ontario the ''Saugeen'' clay is abundantly distributed. These four clays with the compacted Paleozoic rock-shales yield all the clay products manufactured in Ontario.

The ''Erie'' clay, we have already seen, is that portion of the boulder-clay which has been laid in water, and was thereby sorted sufficiently free from gravel and sand to be used in the manufacture of clay products. I found this clay not only in the area already spoken of, but in every county south and west of the line above indicated. Erie clay is of a deep blue color when moistened, and an ashy gray color when dry; it is usually very ''fat'' or strong, and is rich in lime, carrying about 18 per cent. of CaO. This is sufficient to counteract as much as 7 per cent. of iron oxides, and thereby causes the products to burn white instead of red. All the white brick, tile, pottery, or other white clay products, made in Ontario, are from this Erie clay. Any clay-user can easily detect the presence of this ''lime'' by simply moistening the clay with acid. If lime be present the clay will effervesce, or bubble up. Such clays will burn white, because ferrous compounds form on burning, and these are white to buff in color. There are enormous quantities of this Erie clay in Ontario. The supply, in fact, is inexhaustible.

What I have named ''Red Top'' clay is not a separate formation, but simply the weathered upper layers of the Erie clay. It is given a distinct name because it is an extremely important material to clay users in Ontario. Surface waters have a very solvent effect on the carbonate of calcium, the so-called ''lime'' found in clays. Such waters, therefore, by soaking through the Erie clays dissolve a large part of the ''lime'' and carry it away in oslution. They act similarly on magnesium compounds, but to a much lesser degree. A glance at the analyses given below will show the effect of surface waters on Erie clays. In each case the ''Red Top'' clay was taken immediately above the ''Erie'' clay whose analysis is coupled with it.

Comparative Analyses of Erie and Red Top Clays*

Locality	Kind	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	$(Na_2K_2)O$	Loss by heat	Loss of CaO
Ridgetown	Erie	39.82	12.69	4.67	15.56	3.72	3.19	18.82	
	Red Top	65.06	14.15	4.67	2.36	2.18	4.14	6.76	13.20
Exeter	Erie	37.72	10.72	3.51	16.90	7.05	3.06	21.76	
	Red Top	63.56	19.91	6.24	1.91	2.42	3.85	5.64	14.99
Stratford	Erie	46.16	13.76	5.58	15.74	3.78	2.70	17.48	
	Red Top	69.12	14.03	4.81	1.94	1.10	3.58	4.80	13.80
Waterloo	Erie	44.30	11.21	4.05	16.10	3.81	3.02	17.74	
	Red Top	68.06	14.18	6.13	1.34	1.98	3.42	4.86	14.76
Preston	Erie	51.30	9.80	3.70	13.63	3.82	3.91	13.88	
	Red Top	67.10	15.30	4.80	1.63	1.59	3.21	5.44	12.00
Beaverton	Erie	37.50	10.31	3.59	22.56	2.61	3.45	19.60	
	Red Top	59.96	19.58	5.86	2.62	2.30	4.05	5.00	19.94
Peterboro	Erie	47.50	13.66	4.44	15.58	0.80	4.42	12.94	
	Red Top	64.44	15.26	5.96	3.68	1.78	5.72	2.92	11.90
Picton	Erie	39.48	9.11	3.71	18.33	4.83	2.66	23.30	
	Red Top	59.48	14.80	5.38	4.60	3.32	4.70	6.82	13.73
Renfrew	Erie	50.06	14.58	4.78	14.00	3.47	4.10	9.76	
	Red Top	54.38	19.18	7.30	4.60	3.20	5.24	5.60	9.40
Prescott	Erie	49.85	13.10	6.18	14.32	3.13	4.14	10.28	
	Red Top	55.34	10.80	7.62	2.18	2.40	5.67	5.50	12.14

Our analyses show that the CaO is reduced from over 15 per cent. in the Erie clay, to under 3 per cent. in the Red Top. It no longer equals, much less exceeds, the percentage of iron oxides, consequently our products now burn to the ferric state, and this gives us the red color instead of the white or buff. I have already stated that the CaO is present in the form of the carbonate $CaCO_3$. With the loss of CaO, we therefore have a similar loss of CO_2, and we see this in the diminuation in the amount of loss by ignition in the last column of analyses. The clays chosen for analyses are from sufficiently scattered parts of the province to show that this is a principle and not an accident. Wherever the Erie clay was found in the province, a layer of Red Top clay of some thickness was also found. Naturally, this varies greatly in thickness, which is rarely over four feet, except along a crack, a water-course, roots of trees or shrubs, etc.

Illustrations by courtesy of Bureau of Mines, Toronto

*Analyses by A. G. Burrows at Provincial Assay Office it is easily seen on any clay-cut (fig. 2), and we can now understand why one and the same clay bank in southwestern Ontario will yield both red and white products. As the layer of weathered clay is rarely over three feet deep, we can also see that th supply of red-burning clay in what is usually called "Old Ontario" is extremely limited.

Turning now to the eastern part of Ontario, we have a small area extending from our Prescott-Ottawa line, to the boundaries of the province. The clay of this area appears to be identical with the Erie clay just described. In reality, however, it is quite different. It has the same slaty blue color, is very deep, has the same dense, strong character, and a typical weathered top layer, but even the fresh, unweathered clay here is very low in lime and magnesia, as the analyses below clearly show. This Leda clay, as it is named, will therefore burn to red colored products. This clay, of course, extends on eastward into the Province of Quebec, and there covers a great area. I have not included an illustration of Leda clay, as it would not differ in appearance from the Erie clay beds shown in figure 2.

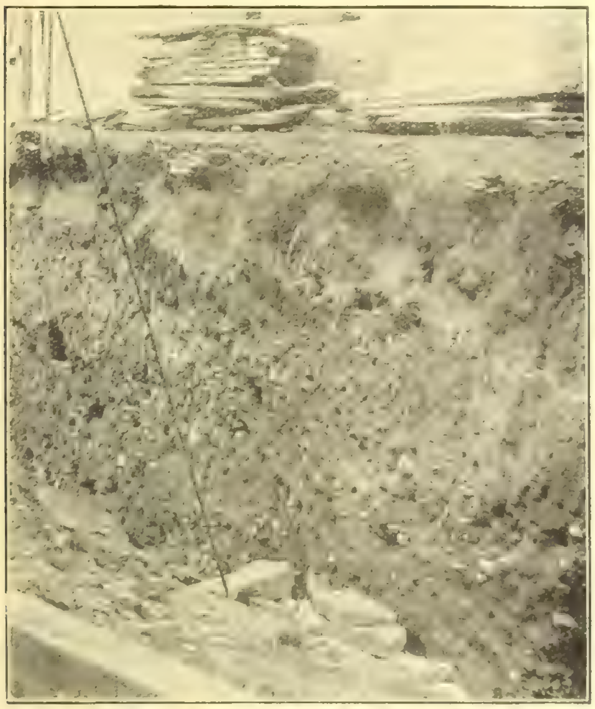


Fig. 1—A Deposit of Boulder Clay

Analyses of Leda and Saugeen Clays*

Locality	Kind	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2K_2O	Loss by Ignition
Arnprior	Leda	57.98	19.00	6.18	3.78	[illegible]	5.68	3.18
5 miles East of Arnprior	Leda	62.06	15.54	5.70	1.91	3.11	[illegible]	[illegible]
Ottawa	Leda	[illegible]	17.07	8.27	4.17	4.55	4.38	[illegible]
Hull	Leda	52.86	17.42	[illegible]	[illegible]	3.37	4.97	5.65
Sault Ste. Marie	Saugeen	64.30	[illegible]	[illegible]	[illegible]	2.02	5.23	[illegible]
Spanish River	Saugeen	61.10	[illegible]	6.34	2.66	3.35	4.68	4.52
Sudbury	Saugeen	[illegible]	[illegible]	4.67	[illegible]	2.73	4.71	4.35
North Bay	Saugeen	64.68	17.21	5.40	2.31	2.75	[illegible]	3.90
New Liskeard	Saugeen	[illegible]	[illegible]	5.41	5.10	3.27	4.77	7.30
Bracebridge	Saugeen	63.00	[illegible]	6.28	[illegible]	2.67	[illegible]	3.63
Pembroke	Saugeen	62.30	[illegible]	5.63	[illegible]	2.68	[illegible]	3.60
Casselman	Saugeen	[illegible]	[illegible]	[illegible]	[illegible]	3.10	4.26	[illegible]

The remaining portion of the province, or that part lying north of the line from Ottawa to Lake Huron, has, on the surface, an entirely different clay, called the Saugeen. It lies unconformably on the Erie and Leda clays in the northern extension of their respective areas. I have seen this clay all the way from Casselman to Winnipeg, and from the line described above to within seventy miles of James' Bay. It is, therefore, exposed over a greater area than either of the other clays mentioned. This Saugeen clay is composed of a great number of alternate bands of strong clay, with bands of fine sand or marl, in some cases. The individual bands are usually not over three-quarters of an inch in thickness, but occasionally reach three inches in depth. The result is a very striking section. (Fig. 3.) Such bands are repeated so often, however, that banks twenty feet or over in height have been formed.

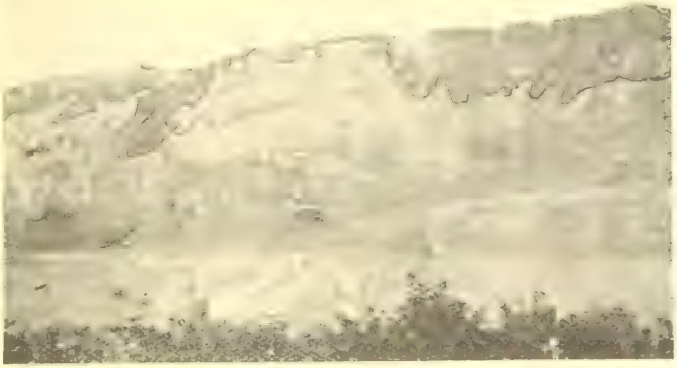


Fig. 2—A Bank of Erie Clay with its Typical Weathered Layer of Red Top Clay

Marl is simply another name for calcium carbonate, or "lime," as clay users call it; consequently where the light-colored bands are marl the percentage of CaO runs so high that the clay is not well suited to the manufacture of clay products. The color is neither a good red, nor yet a white, but a light pinkish shade. This marl, moreover, burns to ordinary lime, which causes the brick or other product to break up easily by slaking. As a rule, however, the light colored layers are fine sand, and this when tempered, or pugged with the strong clay bands, renders the whole mild, and eminently suitable for clay working, and the products are a good red color. The great "Clay Belt" of Northern Ontario is Saugeen, and it is these layers of sand which mix with the clay, to mild it down, and make it so suitable for agricultural purposes.

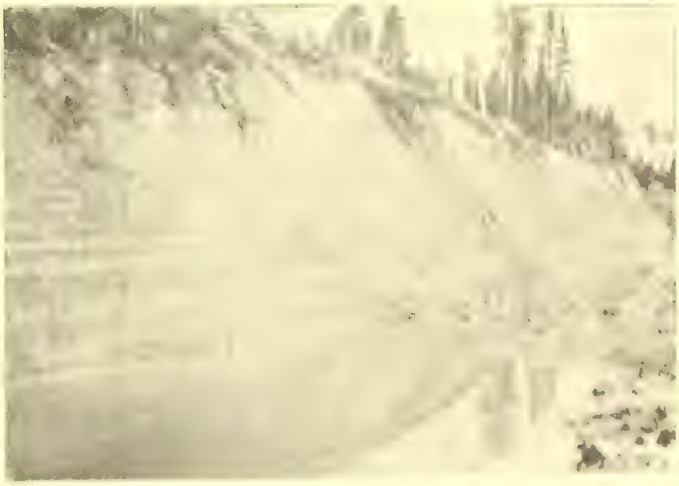
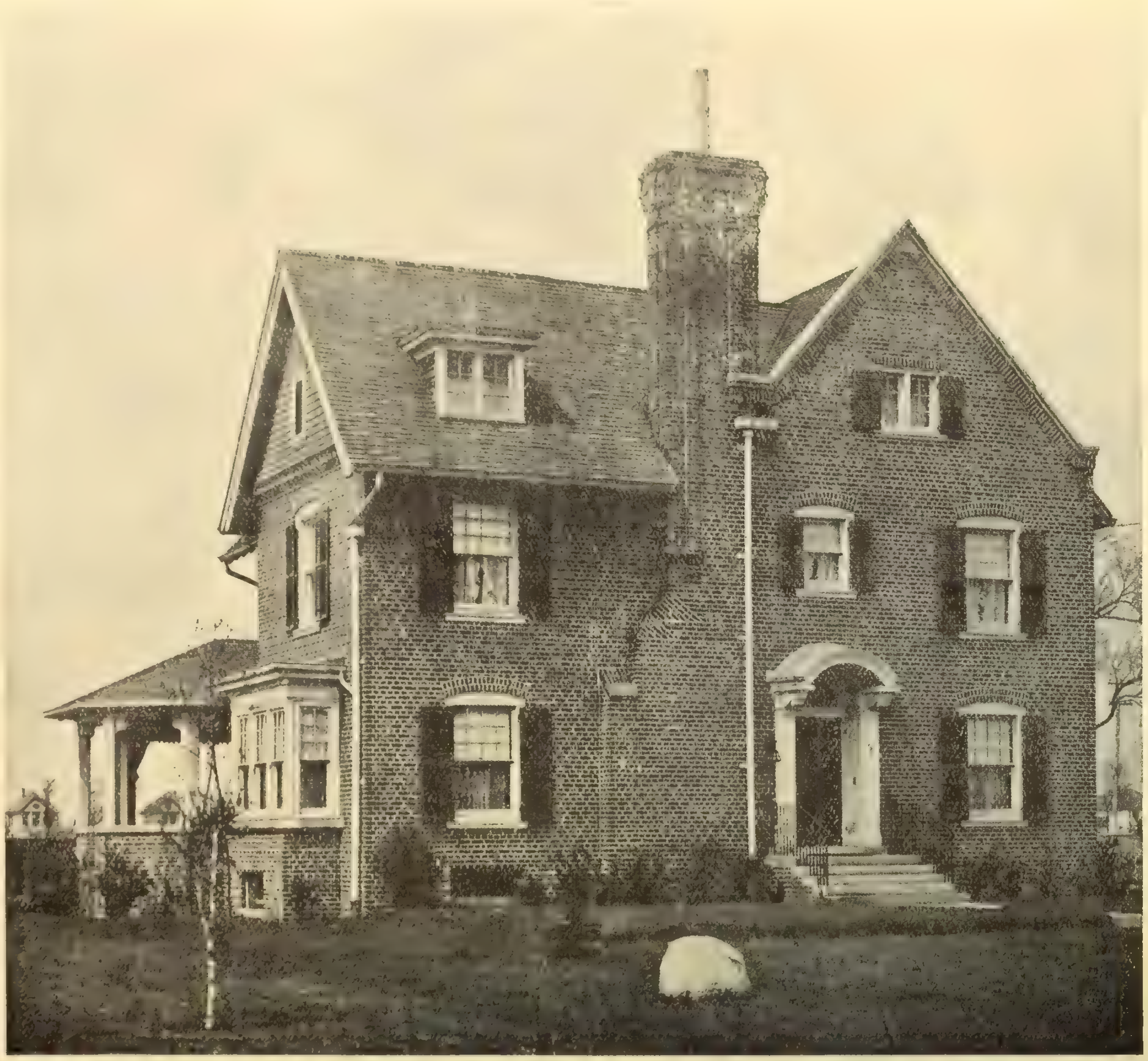


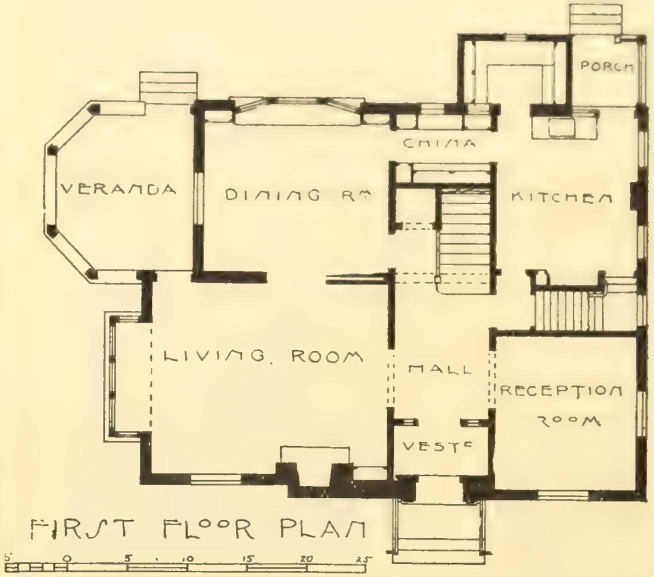
Fig. 3—A Railway Cut in Saugeen Clay. Note the Alternate Bands of Clay and Sand (Lighter)

To sum up our resources of clay in Ontario then, I would say that in Western Ontario we have unlimited supplies of white-burning clay, but very limited supplies of red-burning. In Eastern Ontario we have unlimited supplies of red-burning, and practically no white. In Northern Ontario we have unlimited light red-burning clays and little or no white-burning.

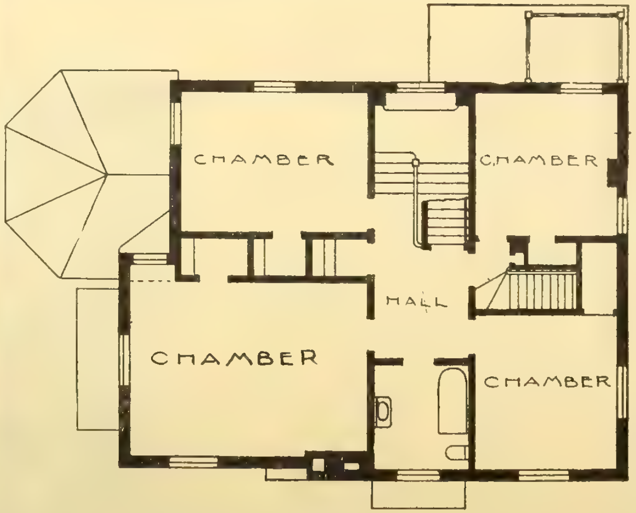
---

*Analyses by A. G. Burrows, B. of M. at Provincial Assay Office 1906





FIRST FLOOR PLAN



SECOND FLOOR PLAN

House at Walkerville, Ont.—A Good Illustration of English Bond Brickwork with Heavy Mortar Joints—Architects: Albert Kahn and Ernest Wilby, Associated.

Possibilities of Brick for House Building

Of Interest Primarily to the Manufacturer— Essential to Cater for Varying Conditions— Study Architectural Requirements— Adaptability the Keynote to Success

By F. S. Atkinson

Bricks have the advantage over almost any other material, and manufacturers should take their opportunity to adapt them to the new conditions of the trade. It is not sufficient to make simply the old bricks and rest content at that. The building trade is changing continually, and new materials, shapes and sizes of bricks are demanded to meet the requirements. One has but to note the improvements made in the last few years in architectural and structural terra cotta to see this. Terra cotta has come into universal use in our cities for outside and inside finish. The modern square blocks of cream-white terra cotta for clothing the outside steel framework of buildings proves more acceptable than stone or marble, and many noted illustrations of this adaptation of the material to a new use could be cited. The terra cotta blocks are lighter than stone or concrete, and when used on very tall buildings they reduce the load on the steel frames materially. Terra cotta flat tiles for domes, arches and stairways are also in considerable use in a number of our best buildings, and they are rapidly tending to supersede the iron and steel domes and stairways.

In regard to ornamental terra cotta one has but to study the newer buildings of large cities to note the remarkable adaptation of this material to a new use. It is lighter in weight than stone, more fireproof, and shows greater durability. It is not easily affected by weather conditions, and consequently requires less cleaning. It will retain its color and form indefinitely, and the front of a building thus ornamented is an imperishable product of the day. There is less danger of terra cotta ornaments getting loose from their moorings at great heights above the street level, and when anchored directly to the steel frames they could not be shaken off by an earthquake. The anchoring of terra cotta blocks for exterior use to the framework is also a work that makes this form of building of paramount value in earthquake countries. The blocks are anchored by embedding the iron rods in the material during the baking, and then twisting them to the iron frames.

Adaptability—Meet the Requirements.

The skill with which structural and ornamental terra cotta manufacturers have studied the architectural needs of the day and then adapted their material to meet the requirements may be taken as a sample of what many brick makers could do in their line. It is true that many brick concerns are to-day specializing on particular forms and shades of bricks in a highly commendable way. In hard burnt enameled bricks for both exterior and interior uses great strides have been made. Enameled bricks are in demand now for exterior ornamental use in connection with terra cotta. In several of the new buildings in New York several million enameled bricks have been used in this way. Their soft, shining surfaces add sufficient contrast to the terra cotta blocks to make the finish highly artistic. The facade of a modern building constructed of ornamental terra cotta and enameled bricks attracts general attention, and is superior in very many respects to more expensive marble and stone. In the first place, the materials retain their color and clean appearance much longer and do not require frequent cleaning.

Enameled bricks for tunnel use, railway stations, lavatories, grill rooms and kitchens, laboratories, slaughter houses, gymnasiums and baths have become within five years the most satisfactory material, and millions of the bricks are thus employed. Many of our first class cities insist upon subway tunnels being lined with these bricks, and also all public baths and lavatories. The sanitary value of enameled bricks is also a point that is worth considering. In laboratories they are of special value where fumes of acids and chemicals will discolor stone, metal and wood. Manufacturers of enameled bricks have adapted their products to a great variety of uses, and with bricks selling at $100 per thousand there is a constant demand for them. In the end they prove more satisfactory than inferior materials at half the cost.

The employment of bricks for mantels and fireplaces is another feature of the industry that has gained greatly in the last few years. The revival of the old brick fireplace is now popular among architects and builders. We have had wood mantels and marble and stone mantels until people are tired of their monotonous finish. Wood mantels, unless done in hard woods expensively carved, are very unsatisfactory. They have a cheap appearance and their durability is questionable. The heat of the fireplace or chimney invariably causes them to warp and crack within a short time. Hard woods, hand carved, are almost too expensive a luxury. Marble mantelpieces have the same disadvantage of cost, and also that of unpopularity.

The old fashioned brick fireplaces were pretty in their way and are being imitated in some instances. But the rough bricks used in them are not satisfactory for modern fireplaces. To obtain this the manufacturer of fireplace bricks should employ all the colors, shades and sizes within his means. Architects generally draw the designs they need for mantels and fireplaces, and experience has shown that these designs can be worked out better with bricks than any other material. The different sizes of bricks lend themselves better to such artistic development than any other articles. But it is a mistake to suppose that all has been accomplished in this direction. A short time ago our bricks and terra cotta were limited to a few plain colors, but to-day we have them produced in a great variety of shades. The first essential to the manufacture of fancy pressed bricks is the right kind of clay. A good many manufacturers have found clay beds of such striking color that their bricks have become popular from the outset. Just now there is a pretty thorough searching of the different parts of the country for clay beds which will show other new colors. Nearly every month the report of some new discovery of remarkable clay deposits is received, and new plants are established to work the deposits. A delicately tinted clay product that shows unusual colors of a durable nature when made in bricks is sure to have a commercial success.

Combination of Clay and Mineral.

But a feature of this work which has been neglected is the combination of various clays and mineral elements for the production of bricks of special beauty. This work is entirely in its infancy and requires skilful working. It is only occasionally that a clay bed of great extent can be found which yields a uniform color for fancy pressed brick. As an illustration, a New Jersey concern which popularized a [illegible] creamy white brick with a delicate shade of light blue running through it had all it could do to fill orders at high prices. The bricks were used for the finishings of mantelpieces and fireplaces of colonial houses. Architects ordered the bricks so freely that the concern made money rapidly. Then the clay bed gave out and the [illegible] of the surrounding deposits was not [illegible]. Complaints began to be received that the new bricks were not up to specification. The coloring was not [illegible] and a [illegible] of bricks began to lose standing. It was impossible to substitute other bricks for the old ones. The company looked in vain for other similar deposits, and then, in desperation, it sought to manufacture similar bricks out of a composition of several clays. This did not answer, and a chemist was called in, who, after analyzing the composition of the old clay, proceeded to specify the mixing of clays and mineral ores. After considerable rather costly experiment, desirable results were obtained. Once more the company produced the right sort of bricks, and to-day they are used freely for interior fireplace construction.

Brickwork—Some of its Uses and Abuses

Semi-circular Arch the most Successful Type—Errors of Construction in Other Forms—Some Examples of Satisfactory Work and Otherwise

Specially contributed by S. H. PENLINGTON, A.R.I.B.A., Toronto

The idea of the writer is to point out briefly some of the means employed in using bricks other than in piers, gable ends and walls.

The commonest use is certainly the arch, of which the semi-circular type is the most successful. Errors of construction, however, appear immediately when other forms are used. Take, for instance, the gauged arch as in figure 1. Now this looks perfectly simple, but in practice it is usually built flat on the soffit, and with the jointing at right angles to the brick courses (fig. 2). The error of his is at once apparent in the sketch. The arch should be cambered about 1-8 inch per foot of span to correct the sagging appearance commonly noted in the flat arch, and it should be jointed as shown in sketch No. 1.

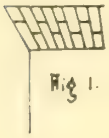


Fig 1.

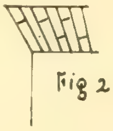


Fig 2.

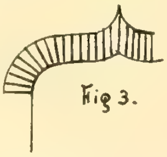


Fig 3.

I have noticed in various buildings arches which are interesting from the point of view of brickwork misapplied. The most glaring example is a window arch, illustrated in fig. 3. It is perfectly patent that the bricks at the crown of the arch depend entirely upon the mortar joint and that they would not carry any weight. Another example of pretty work that is not practical is shown in fig. 4, the inner arch being supported by the brickwork below. This work is also full of triangular spaces which will hold a lot of moisture and which will be sure to make the wall damp inside. I have seen a combined gauged and semi-circular arch in use. This, of course, was carried on the window frame. The jointing needs no comment (fig. 5).

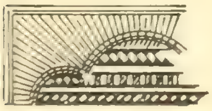


Fig 4.

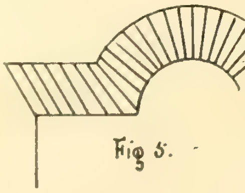


Fig 5.

An example from the Jarvis street Collegiate Institute, Toronto, is interesting as showing the correct application of arches, but bad filling of the spandrels (fig. 6). The main arch should not appear to run down and uspport itself on the small arches. The spandrels should have been bricked up horizontally, as shown in right side of sketch.

A very good example of the brick arch (fig. 7) employed in Gothic architecture is commonly seen. The pointed arch, being the stronger, takes the premier position of weight-carrying. The semi-circular arch, coming beneath, adds to the beauty of the design and leaves a convenient space for the application of ornament between the two arches.

The treatment of the gable is well seen in the Jarvis street collegiate institute, Toronto (fig. 8). This is typical of the churches in Lombardy and other Romanesque buildings where brickwork was commonly used. A common brick gable typical of Norfolk cottages is seen in fig. 9. This raking construction of the coping is only applicable to gables where the weight is so small that sliding motion cannot take place. It is not recommended. The treatment shown in sketch No. 14 is to be preferred. Another brick gable treatment is shown in sketch No. 10, with the slates projecting beyond the face of the work. This is commonly done by laying the cornice raking in cement, but then, of course, the work depends entirely upon the cement to keep it in position, and not upon good brick work, as shown.

Brick corbels, panels and aprons are often effective when judiciously applied. There is the usual moulded apron done with rubber bricks and set in putty (fig. 11) or the square apron (fig. 12), which has little to recommend it. A plain panel set about half an inch, as shown in fig. 13, would be better. A brick corbel under the eaves or parapet wall is the common finish of the brick building. It is of great variety and is so simply done that few errors occur and further comment is unnecessary.

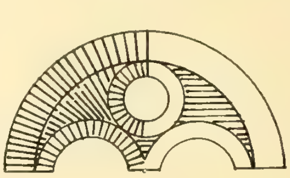


Fig 6.

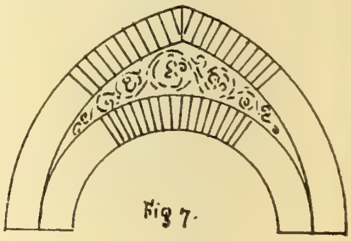


Fig 7.

The chimney stack in old buildings is generally the most noticeable feature, particularly in the Elizabethan period. The structures are of good design, always being quite practical in their brickwork. Special bricks are used so as to get proper bond at the angles. An example I have in mind is one of three stalks (fig. 14). In all cases the bricks are flat-bedded and properly bonded, specials being used where necessary. A single stalk chimney, fig. 15, at the Church of Holy Trinity, Toronto, is an attempt to obtain the same effect without the necessary special bricks, the result being bad; although set in cement mortar, two of the angle bricks have fallen out. The bricks are laid almost on end and it is one of the worst bits of construction I know. The church is only some sixty years old. The

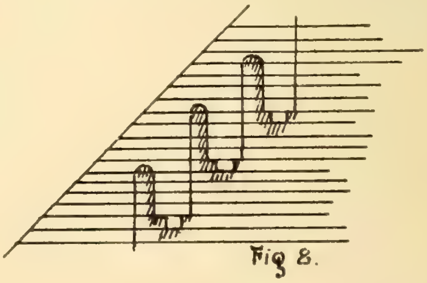


Fig 8.

Elizabethan chimney is 250 years old and is still in good condition. Adjoining this masterpiece is something equally bad. There is a raking battlement, fig. 16, wherein almost every brick would have to be cut. No bricklayer would ever be guilty of such work on his own account. Raking brickwork is never good, but added to this we get the splayed copings wherein every joint is twisted and small fillers have to be used at the angles, the cement alone holding the work together. The end of each battlement has to be rendered in cement to hide the bad work and keep the weather out. This alone tells the tale. Good work need never be hidden.

Now, the question arises: what is good brickwork? This is best answered by a brief consideration of the shapes and manufacture of bricks. Common bricks are made rectangular in shape, of a size 3-inch x 4½-inch x 9-inch. They are made rough, or have a frog or panel impressed upon their 4½ x 9 face. This is in order that they shall have a firm grip of the mortar and not tend to slide. This fact alone is quite sufficient to show that bricks are intended to be laid flat, and not raking. All bricks that are not flat bedded cannot be well laid.

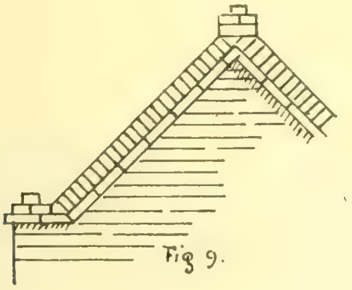


Fig 9.

The next point is that the 3 x 9 and 3 x 4½ face of the brickwork is smooth. This is so that water or snow shall be kept out of the brickwork as much as possible. Therefore this face of the brick should always be exposed to the weather. It also follows that brickwork that is cut and exposed to the weather cannot be good—special bricks should be used.

Bricks are only intended to bear compressive strains, therefore they are quite properly used in arches, but here the bricks are cut to the required wedge shape or voussoir, or the mortar takes up the irregularity of the jointing in big arches.

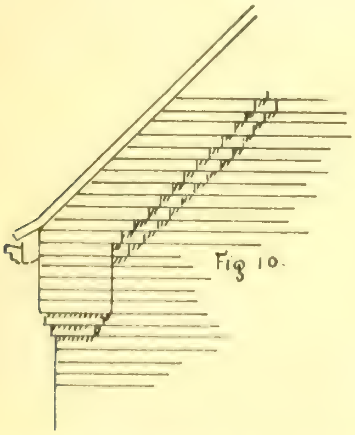


Fig 10.

Good brickwork will always have straight joints of regular thickness. The vertical joints will come over one another. The work will be properly bonded in itself without the use of hoop iron or other reinforcement. Closers will be used at the angles to break the vertical joint into alternate courses. Any panels, mullions, sills, or enrichment must have specially made bricks. The result will then always be satisfactory, from both a structural and an artistic point of view.

STRAINS IN ROPES DUE TO SLACK.

An American engineer has recently been measuring the strains in hoisting and hauling ropes due to the slack in them, and particularly the bad effect of suddenly applying the load

He found that when a load was suddenly applied to a rope with 2½-in. of slack the strain was 40 per cent. greater than when the same load was applied gradually and the work done steadily. With 3-in. of slack the excess of stress was 65 per cent. greater, and with a slack of 6-in. the strain on the rope was equal to more than double the load. With a foot of slack the strain at starting was more than three times that with starting steadily with a taut rope.

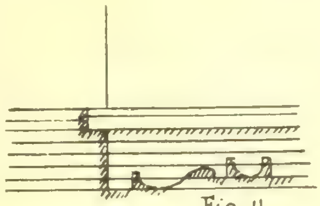


Fig 11.

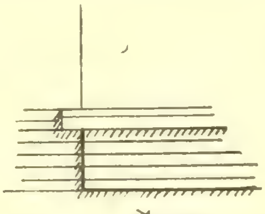


Fig 12.

Such sudden and excessive stresses are very bad for ropes and rapidly cause deterioration which shortens the life of the rope and tends to sudden and unexpected breakage.

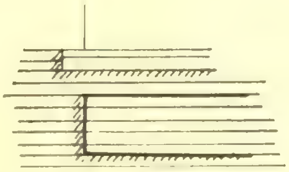


Fig 13.

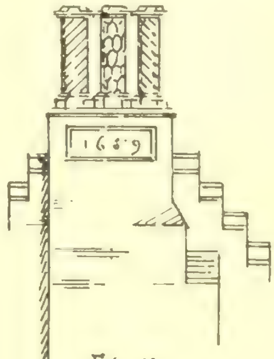


Fig 14.

The jerk can usually be avoided by a little care at the commencement of the haul or hoist, and by the use of powerful springs between the wagons and the rope. These latter are seldom (if ever) used in clayworks, and they are not really necessary if the man in charge of the hauling drum is made to wind slowly until the rope is taut, and to increase his speed as the rope takes up the load.

The advantage of endless chain haulage is that it enables the ropes to last longer because of the more even distribution of the weight and the steadier drive, it being difficult to put on the load with so violent a jerk as in direct haulage.

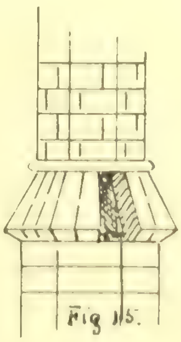


Fig 15.

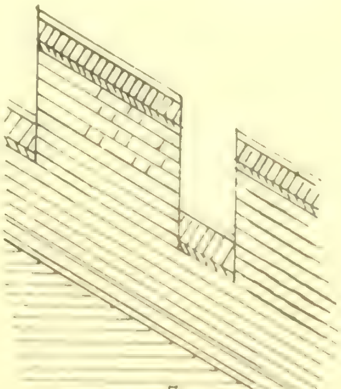
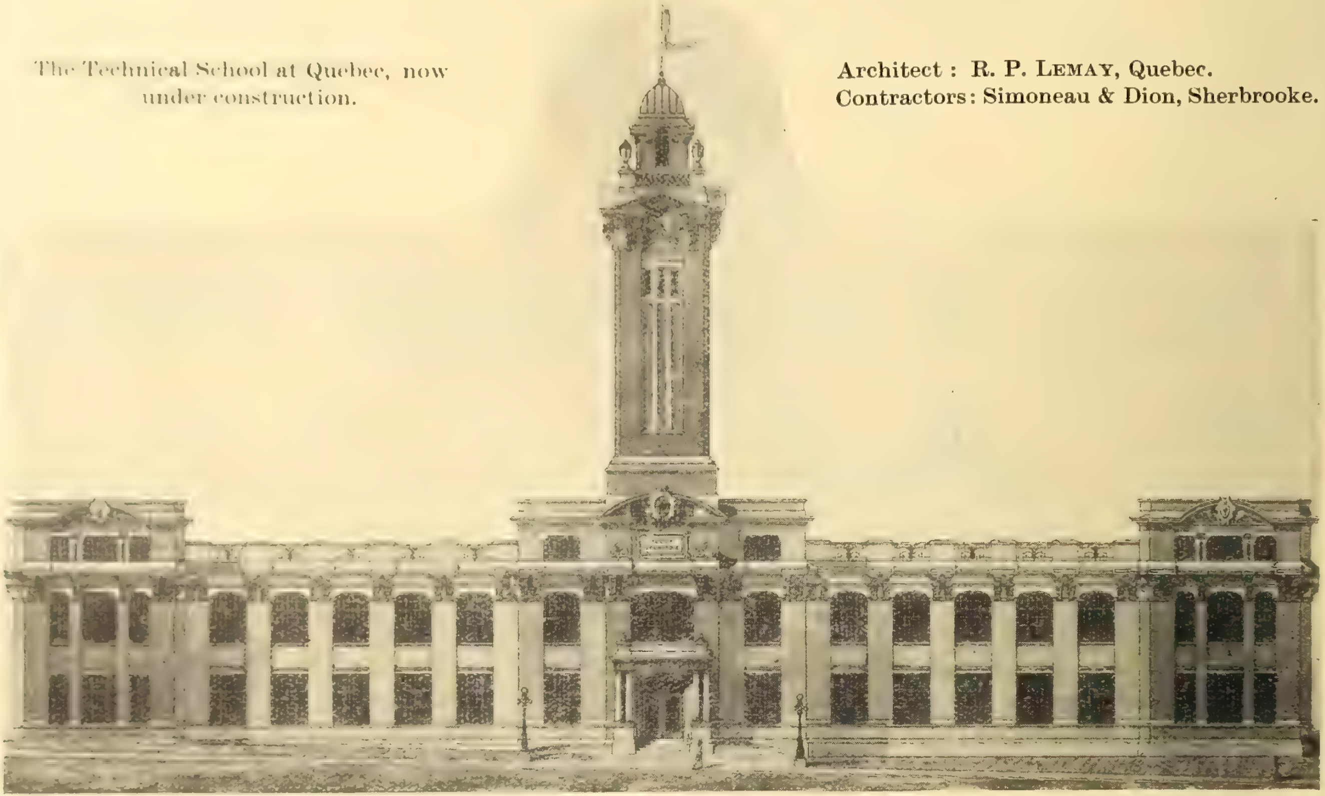
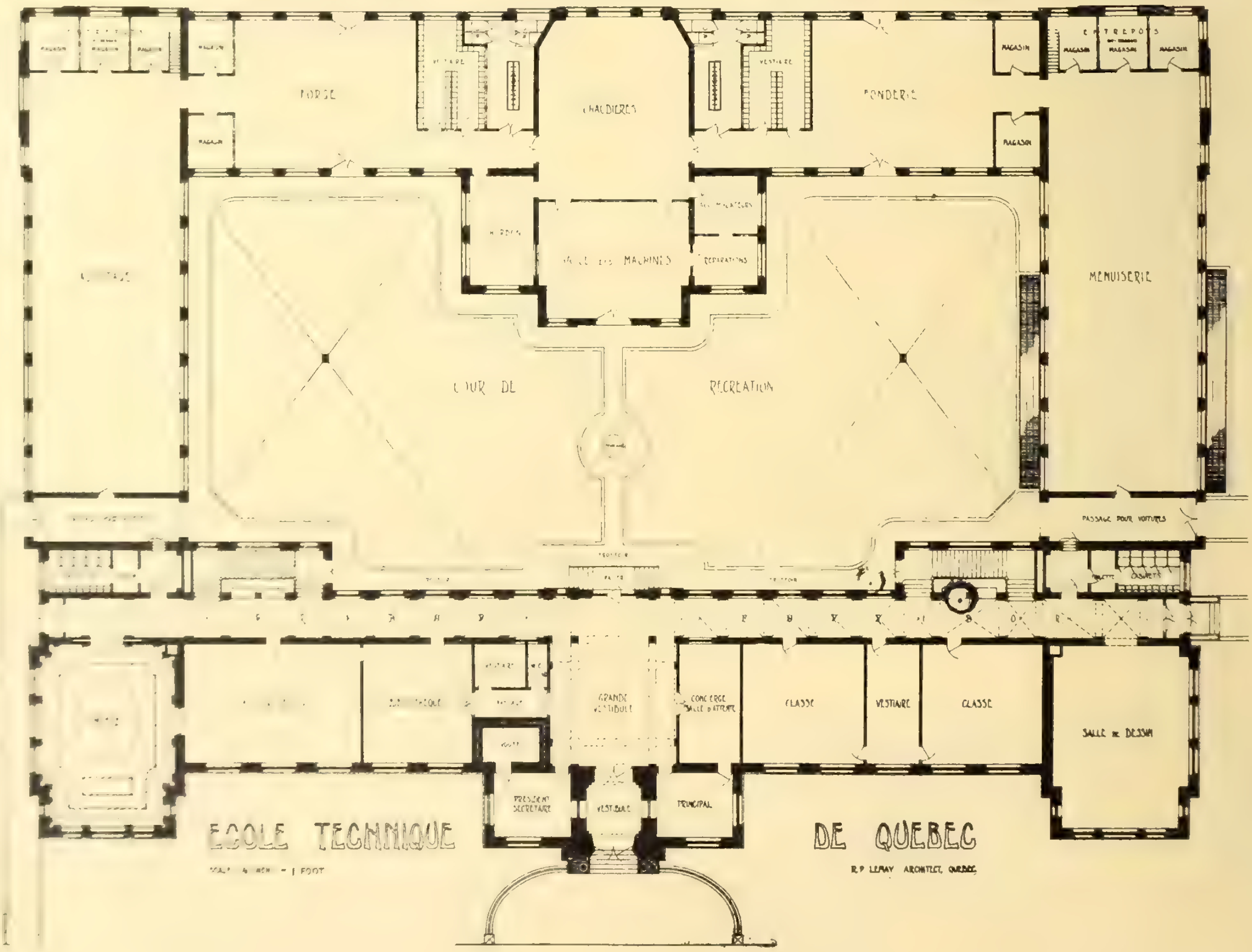


Fig 16.

The Technical School at Quebec, now under construction.

Architect : R. P. Lemay, Quebec.
Contractors : Simoneau & Dion, Sherbrooke.





General Floor Plan, Quebec Technical School

The New Technical School at Quebec

The Quebec Technical School, now under construction, is a particularly noteworthy example of the successful results obtained by the use of pressed brick in buildings of this class. The structure has a frontage of 252 feet and a depth of 176 feet and is being erected on strictly fireproof lines.

An interior open court separates the administration building and technical school proper from the shops. On the ground floor of the main building are located the respective offices of the principal, president and secretary, a museum, library, two commodious class rooms and a large draughting room.

The first storey contains a large academic hall and several good sized class rooms. The principal's apartments, also the janitor's rooms, are located in the second storey of each pavilion. The rear buildings will contain a large boiler and engine room, foundry, blacksmith shop and machine shop. Here also are situated the shops for shoe makers, joiners, carpenters, etc.

The putting in of the foundations to the level of the ground was carried out last fall in twenty days.

Constructional view of the New Technical School at Quebec

The basement of the main building is of granite from Portneuf, Que., a coarse granite of an attractive white gray color. The walls of the building are built of Laprairie red pressed brick with Deschembault limestone cornice and trimmings. A clock tower, 130 feet high, surmounts the main central part, this giving much relief and distinctiveness to the whole structure. The back buildings, reserved for shops and machinery, are also of red pressed brick. The whole space between the pilasters is given to the windows. The pilasters have granite base and cap. A feature of this building is that the arches of all windows are made of square brick. The floors in the main building are of two kinds; terra cotta reinforced, of the Faber system, and a portion of Ferra Lithic plates and concrete. The roof is of Multiplex sheets and concrete.

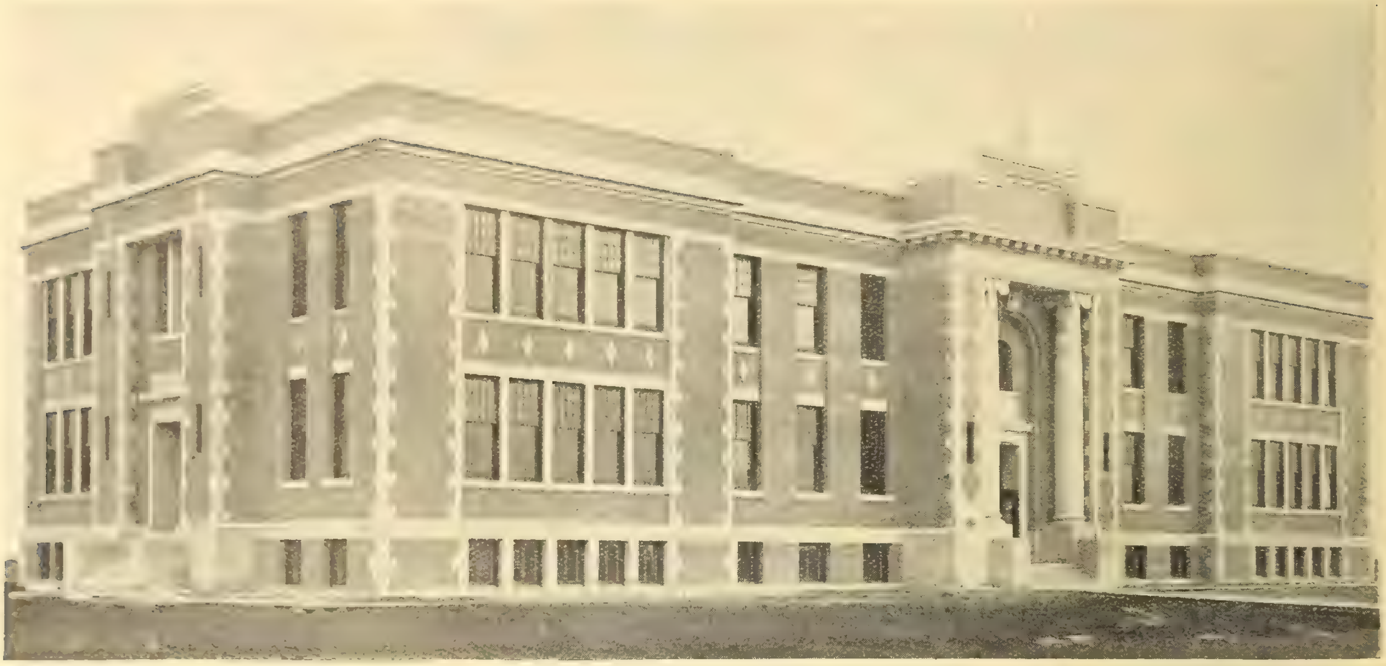
The whole building when completed will cost in the neighbourhood of $400,000. The architect is Mr. R. P. Lemay, of Quebec. Messrs. Simoneau & Dion, Sherbrooke, Que., are the general contractors.

The following extract from a letter received from Mr. H. S. Hancock, city engineer of Fort William, has some significance: "In view of the absence of a good local brick for sewer purposes, we use concrete or tile entirely. This season's tile sewer construction has been much less than usual. The construction of two or three large concrete trunk sewers has consumed most of the available funds."

The Bath Room and Clay Products

In considering the field of clay products, with a view to further extension here and there where the best opportunities present themselves, we are impressed with the idea that the bath room presents an excellent lot of opportunities for those making the line of products used or that may be used in this work, says a recent issue of the Clay Worker. This includes not only the bath tub and sanitary ware, but also tiling for walls and for the floors. The ideal bath room is one which may be made up almost exclusively of clay products, with the bare exception of the piping and metal work. It has been thoroughly demonstrated that, from a sanitary standpoint, nothing equals the enameled clay ware, and gradually a discriminating public is taking notice of this fact and is showing a favorable disposition to use it almost exclusively. Now, aside from the technical matters involved, one important point the trade should take into consideration is this: we are coming to the day when practically everything in the form of a home built in or near cities is to have a bath room, and the more pretentious home, instead of having just one commodious one, is moving toward the idea of one to almost every sleeping room. Moreover, it will extend further and builders of modest homes in the country will include a bath room as a part of their house. Some of the cities have already taken quite a strong stand in this matter, and are insisting that when new homes are built that they are properly equipped with bath rooms.

By and by we may see the day when there will be included in almost every city ordinance a requirement for bath rooms. With things tending this way one hardly needs a pencil and pad of paper to figure out what it means in the way of increased requirements for bath room material. Moreover, it would be almost impossible to figure it out specifically, but we can easily picture the needs multiplied almost a hundred times, and, therefore, this branch of the trade should present openings for further developments that will not only keep the present industries manufacturing such products hustling, but will make room for a number of new ones without in any way endangering the market.

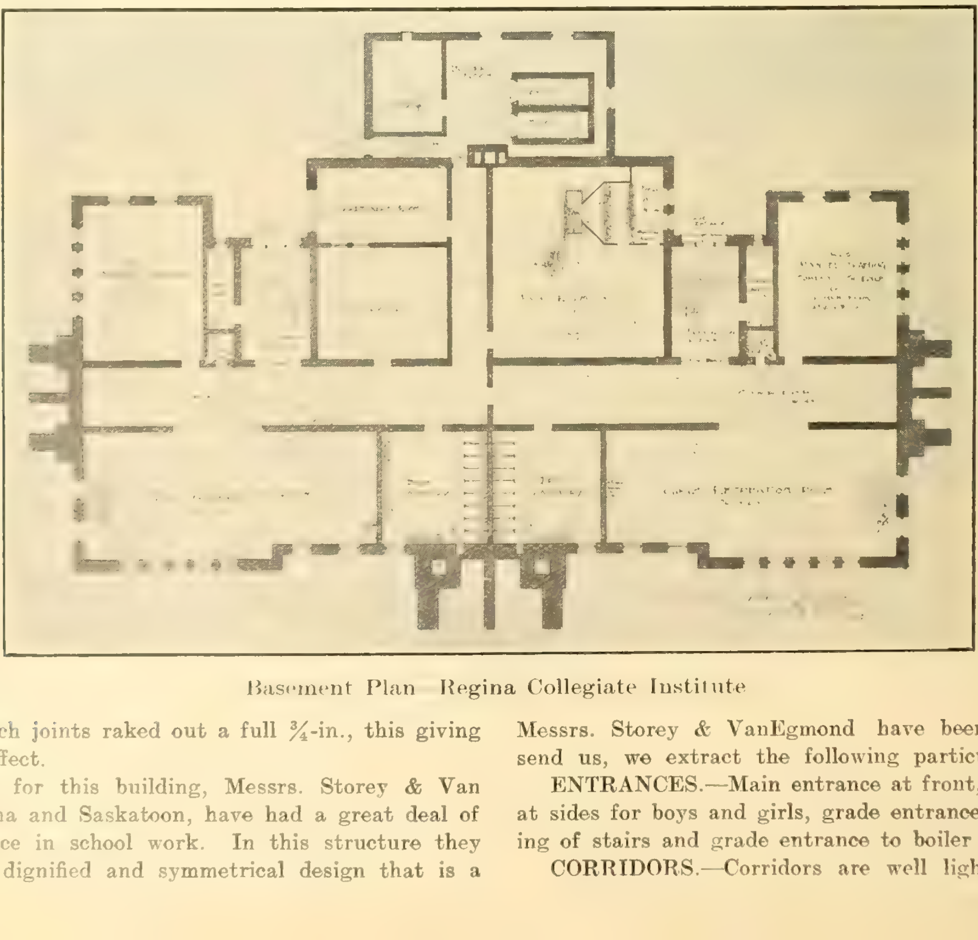


The New Collegiate Institute at Regina

Successful Architectural Treatment of One of Western Canada's Most Noteworthy Brick Structures—Details of the Interior Arrangement

Architects: Storey and Van Egmond, Regina, Sask.

The Regina Collegiate Institute is one of the most noteworthy examples of brick construction in western Canada. The brick used in the building is a St. Louis pressed brick, buff colored, with small iron spots and laid with common mortar with $\frac{3}{8}$-inch joints raked out a full $\frac{3}{4}$-in., this giving a very pleasing effect.



Basement Plan Regina Collegiate Institute

The architects for this building, Messrs. Storey & Van Egmond, of Regina and Saskatoon, have had a great deal of practical experience in school work. In this structure they have produced a dignified and symmetrical design that is a splendid expression of the purpose of the building from the exterior. The interior is so arranged that it will fulfil its usefulness in the most direct manner.

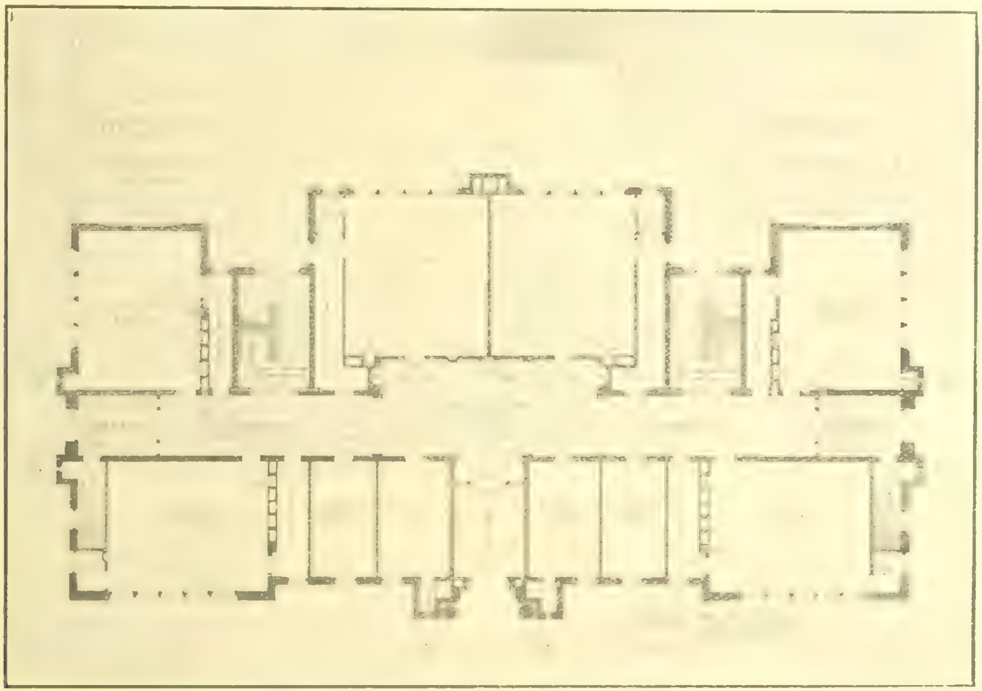
From the comprehensive description of this building which Messrs. Storey & VanEgmond have been kind enough to send us, we extract the following particulars:

ENTRANCES.—Main entrance at front, separate entrances at sides for boys and girls, grade entrance at rear unto landing of stairs and grade entrance to boiler room.

CORRIDORS.—Corridors are well lighted and the usual fire trap stairs in the corridors have been purposely avoided.

STAIRS.—Main staircases centrally and conveniently located and entirely enclosed by fire walls and automatic rolling fire doors. Separate stairs from side entrances are also provided for direct access to recreation rooms.

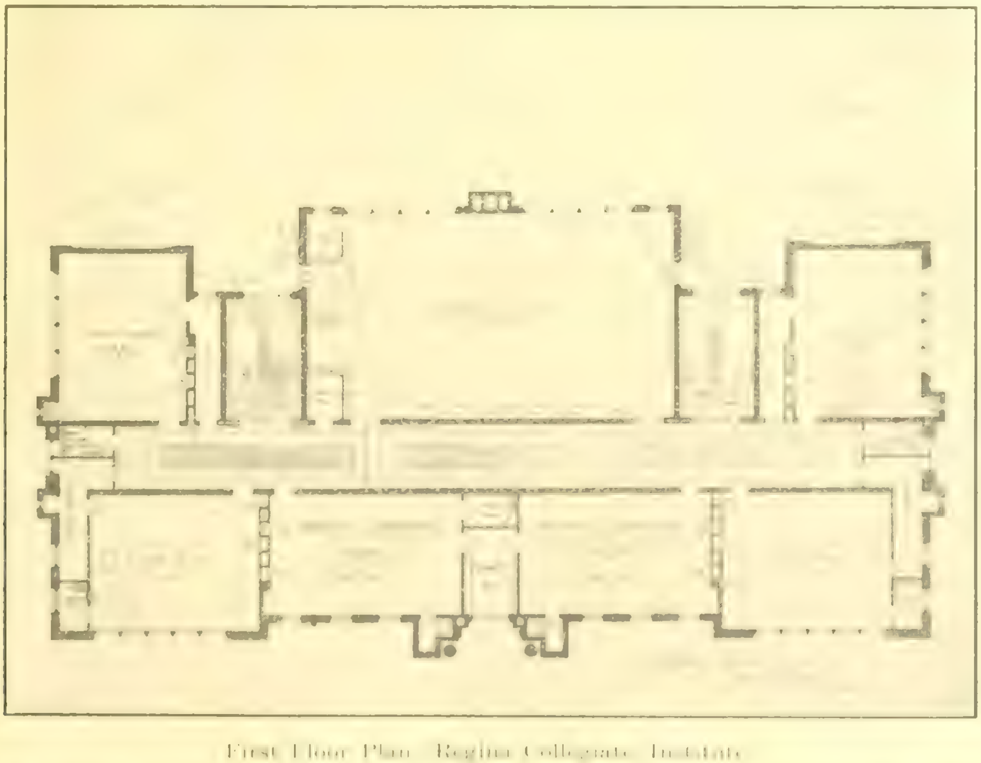
FIRE EXIT.—Special attention has been given to provide for the event of fire, and in addition to fire walls and stairs as above, there are provided two large balcony fire escapes at rear of building with access to same from first and second floors.



Ground Floor Plan Regina Collegiate Institute

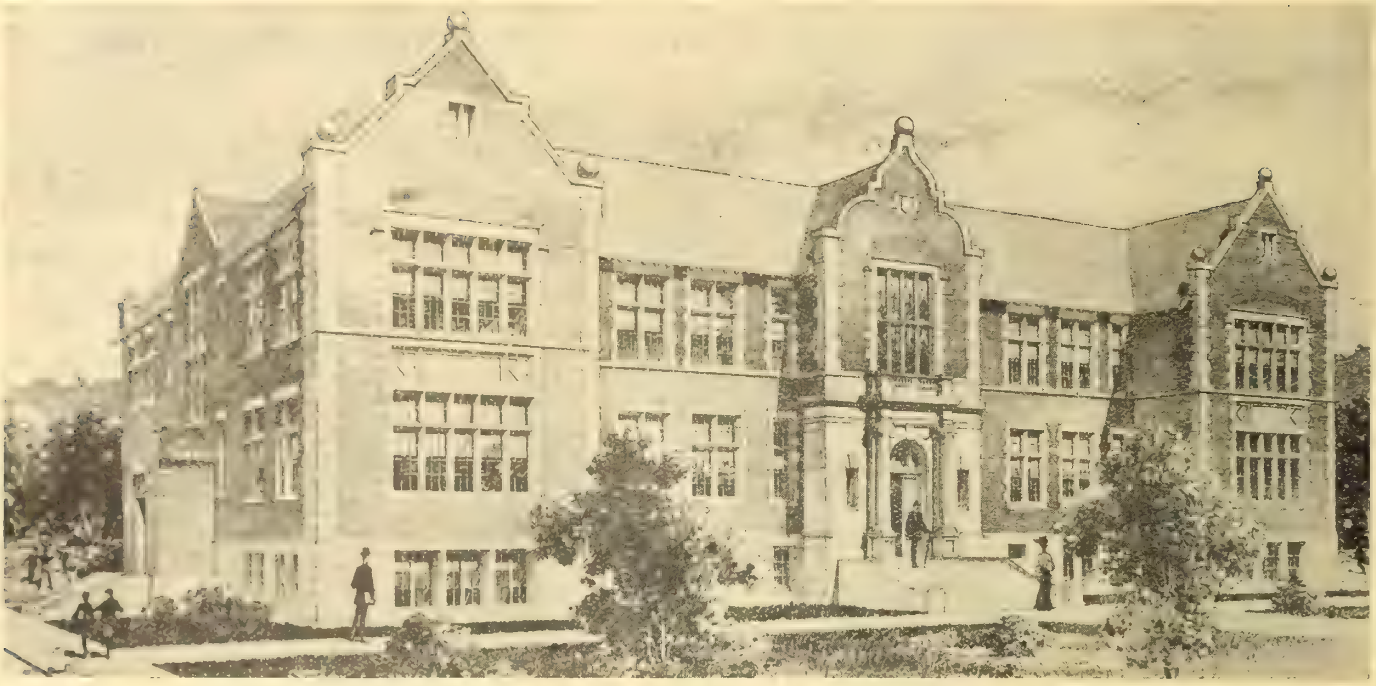
ACCOMMODATION. 12 class rooms, two of which are used as chemical and physical laboratories, and the necessary apparatus room, supply room, dark room, etc., in connection. Principal's room, teachers' rooms and library of commodious size are placed centrally and near the main entrance. Separate lavatories for boys and girls in basement and emergency lavatory on first floor. Large and well lighted assembly hall on first floor with stage and dressing rooms. Recreation or lunch rooms, manual training and domestic science rooms, boiler and fan room are located in basement. Coal storage for three cars of coal and boiler room have been placed outside of the main building.

LIGHTING.—Particular attention is called to the lighting of class rooms which are lighted from one side only by a series of windows, divided by marrow mullions.



First Floor Plan Regina Collegiate Institute

HEATING AND VENTILATION.—The heating and ventilation has been carefully designed so as to insure a uniform temperature of [illegible] degrees at all times and at least six changes of



New School Building at Westmount, Que. Cost $125,000. Architects: Ross and MacFarlane, Montreal

air per hour in class rooms and assembly hall. Low pressure, direct and indirect plenum system of heating and ventilation is used with automatic temperature regulation by thermostats, governing both the direct radiators and fresh air flues. The fresh air enters the building at the intake windows in basement, into the fresh air room, where it is heated by passing over steam coils, provided with an automatic regulating damper and hence through water spray which cleanses the air of all dust and brings it to the proper humidity. The air is then drawn into fan, forced through fresh air ducts and ejected into rooms at a height of eight feet above the floor. The foul air is forced into foul air flues at the floor line, where the foul air lies and ejected into atmosphere above the roof. The boiler installation consists of two return tubular units twinned together in order that only one may be used in the mild weather, which is much more economical than a single boiler. This is the simplest, most positive and most satisfactory system of heating and ventilation that can be installed in a school building.

CONSTRUCTION.—The construction of the building is fire-proof. Reinforced concrete floors are used throughout, with solid brick bearing walls. All partitions are of metal studs and metal lath. The outside walls are lined with hollow tile and plastered direct on these tile. Corridors have Terrazo floors in three colors, wainscotting of enamelled brick in green and brown colors, with all angles rounded. White maple floors in class rooms. Stairs fire-proof with steel strings, cast iron newels and risers, wrought iron railings and slate treads. The outside is executed in buff iron spot pressed brick with raked joints and buff Tyndall stone.

EXTERIOR.—On the exterior, the use of extravagant elaboration has been avoided, and the architects have succeeded in producing a simple, unique and appropriate appearance by fitting architectural treatment. The main entrance is distinctly, but not unduly, accentuated, and the rest of the building has been designed in proper proportion.

The architects lay special emphasis upon the difficulty of securing a good face brick in the West at a reasonable price. The following extract from their recent letter to the "Contract Record" will be of interest in this connection: "We consider that better results can be obtained from brick than from any other materials, for certain classes of work, and when used judiciously under proper treatment. To secure the proper effect, we have had to specify brick manufactured in the United States for a great many of our buildings, and the cost usually runs from $40 to $50 per M. We have done this much against our desire, as we always make it a rule to specify Canadian material where possible. We would ask the eastern manufacturers to investigate the western trade, as we see no reason why they should not compete successfully with American material. There are a number of brick plants in the West, but they have not yet produced a high standard uniform brick, and with the necessary material at hand there is no reason why this should not be done. There are good opportunities throughout the west for the establishment of brick making plants."

Bricks Made From Slag

Brick is made from ore slag in moulds at Brisbane, Australia. The bricks have been found equally useful in the erection of offices and in the construction of water tanks, retaining walls, piers for ore bins, and bases for chimney stacks.

The molds used in making the bricks consist of two L-shaped cast iron plates, and mention may be made of the following features, which have proved important: First, the thickness of the metal, sufficient to chill the slag without becoming overheated; secondly, the reinforcing of the angles to minimize warping; and, thirdly, the adaptation of these reinforcements to form distance pieces by which means space for air circulation is maintained between adjoining moulds. These plates, having been set upon edge on the levelled surface of the slag dump, and arranged to form rows of twenty moulds or thereabouts, are banked up with one and one-half inches of dry sand or ashes.

The slag is poured into the moulds from the ordinary hand-drawn slag pots, which are filled from the double bowl horse pots now in use on this mine. As soon as the bricks have solidified the moulds may be removed and set up afresh elsewhere. After from ten to fourteen hours the bricks are cool enough for handling. Their average weight is eighty pounds, and, when tested with the rough appliances available, they have successfully withstood a crushing stress of thirteen tons per square foot without showing any sign of strain or collapse.

Satisfactory Design of School and Factory Buildings Exemplified at Montreal

The past few seasons have witnessed the erection of many noteworthy structures in Montreal and locality, not a few of which have been described in these columns. Among those which have been completed recently, and concerning which some mention is peculiarly appropriate in this number, are the new school at Westmount and the Ames-Holden office and factory building at Montreal, both of which were designed by Messrs. Ross & MacFarlane, of Montreal.

The new Westmount school was erected at an approximate cost of $125,000, including furniture, etc., and is considered one of the most satisfactory and best equipped buildings of its kind in the province of Quebec, and we might add, at the same time, one of the most attractive. As will be seen by the illustration, the Westmount school is two storeys high and of effective design, the general style being Elizabethan. The school is 165 feet long by 65 feet wide with a basement 11 feet high and two storeys of 13 feet each. It is built of red pressed brick with light stone trimmings. The varying and at the same time harmonious effect produced with these materials provides an illustration of the results attainable with pressed brick under skilled treatment.

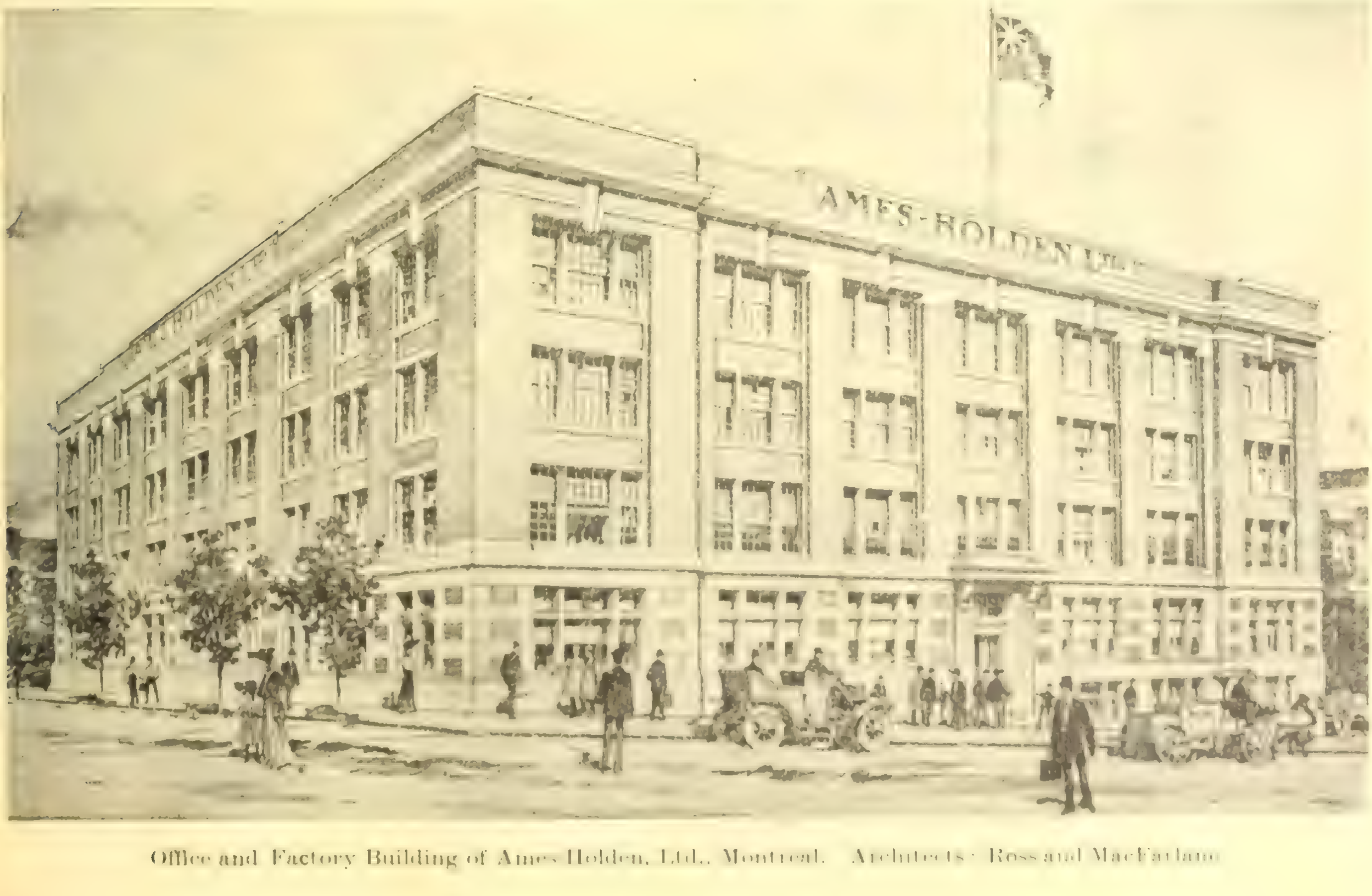
In addition to the main entrance in the centre front of the building there are separate entrances on each side connected by a wide corridor running clear through the building and bisected by the main hallway.

The building contains 16 large class-rooms. On the ground floor, immediately opposite the main entrance, is the principal's office, and at each side of the entrance hall are the teachers' locker rooms, the remainder of the storey being given over to class-rooms. The kindergarten class-room is placed near the side entrance. In the centre of the upper storey there is a large assembly hall, 62 by 44 feet. The class-rooms on this floor open into a wide corridor connecting the stairs with the assembly hall. Every precaution has been taken to provide rapid means of exit. The building is equipped with an up-to-date system of fan ventilation, is heated with warm air and lighted by electricity.

The construction throughout is strictly fireproof, with floors of steel and concrete, and terra cotta partitions. The corridors and toilet room floors are finished with Terrazzo mosaic. The stair cases are of iron with slate treads.

The new office and factory building at Montreal for Ames-Holden, Limited, illustrates the last word in the economical and skilful treatment of buildings of this class. The Ames-Holden building, while necessarily not elaborate, is at once impressive and dignified. It covers an area of 31,679 square feet and has a floor area of 129,709 square feet. Brick enters largely in the construction, stone and reinforced concrete being successfully combined. The stairs are of iron and all partitions of fireproof material. The stairs, elevators and toilet rooms are isolated in separate towers equipped with metal fire doors. The heating system is by a fan ventilation and heating method, by means of which a circulation of pure air is heated and distributed throughout the entire building. One of the special features of the building is the great area of window space, which gives the maximum lighting possible, one of the greatest desiderata in buildings of this character. The large roof area has been turned into a splendid roof garden for the employees, the stairways leading direct from the several factory floors to the roof.

There is a power plant in the central court separate from the building, this including a gas generating plant with Hornsby-Stockport suction gas engines and electric dynamos for the power and electric lighting requirements of the building.



Office and Factory Building of Ames-Holden, Ltd., Montreal. Architects: Ross and MacFarlane

Main Processes of Sand Lime Brick Making

Complete Hydration of Lime Obtained only by Steam Hydrating Method of Manufacture—Raw Material—Chemical Reaction in Hardening

Specially Contributed by Anton Berg, Toronto

Sand-lime brick as its name denotes, is made from sand and lime. The processes for the manufacture of the brick differ in the manner of hydrating the lime and mixing with the sand, but in all cases the mixture of sand and hydrated lime is pressed into brick, which are then hardened by the action of steam at high pressure. According to the manner of preparing the mixture, there are three main processes:

1. The steam hydrating process.—The lime is treated with superheated steam in iron cylinders, and then mixed with the dry sand.

2. Water hydrating process.—The lime is hydrated by adding water.

3. Silo process.—The lime and moist sand are mixed and stored in a silo for periods of 24 hours or longer until the lime is supposed to be thoroughly hydrated.

By far the best results are obtained by the steam hydrating process, as only by this means is complete hydration of the lime obtained.

RAW MATERIALS.—Sand, which chemically is silica, occurs as fine rounded particles or in the form of sharp and irregular grains. For the purposes of sand lime brick manufacture the latter kind is preferable. The presence of clay is injurious to the strength of the brick. The degree of coarseness of sand has also quite an important effect on the strength of the brick. The best brick are made by using a mixture of coarse with some finely ground material. The lime should be free from any unburned limestone, as the presence of this substance causes the brick to crack in the hydrating cylinder.

PROCESS OF MANUFACTURE.—The sand, after being brought in from the bank, is fed into a rotary dryer which is supplied with heat from the steam at high pressure. It is then carried by the rotation of the dryer into a conveyor by means of which it is elevated and discharged onto a screen. From there it passes to the measuring device, where the previously hydrated lime is added in the proper proportion.

The lime, which should be used fresh, is hydrated by exposing it to the effect of steam at high pressure for a period of 4 to 10 hours. The hydrated lime as it comes from the cylinder has mostly crumbled into a fine powder, so that there is little trouble, if any, in pulverizing it before it is mixed with the sand.

The mixture used for the manufacture of sand lime brick is very variable, and depends upon the quality of both the sand and lime, but a usual proportion is about 6% by weight

Luxton School, Winnipeg—A Splendid Illustration of the Possibilities of Sand Lime Brick of hydrated lime to 94% of dried sand. Excess of lime is very injurious to the strength of the brick.

In some cases the use of tube mills or ball mills is advocated for the complete hydration of the lime, but the most efficient, an inexpensive method which is used in American, is the following: The materials pass from the measuring machine into a dry mix mill, and from there to a wet mixer. In this wet mixer the proper amount of moisture is added to the mixture, which is then fed automatically into a heavy steel press, and there molded into bricks. On the thorough incorporation of the mixture and the pressure given in the press depends the success of the finished product. Indeed, Prof. Woolson, of Columbia, has stated that in his opinion, "the amount of pressure a brick receives in manufacture is one of the most important conditions affecting its quality." The press should be massive and built to withstand very excessive and variable strains. A slight difference in the amount of moisture in the mix may cause a much greater variation in the compressibility. In one of the best presses known to the author, the pressure delivered to the material in the molds is about 400 tons a brick, i.e., 25,000 lbs. a sq. in., and the machine in doing this, has three distinct pressures and an up and down motion of the sand in the mold. First, it presses from the top, then from the bottom, then comes the third pressure from the top and bottom together, with the movement of the sand and lime under pressure in the mold, then the lift out. The press contains four molds, so that every time the press lifts, four bricks are delivered on the table in front of the machine.

Besides this press, which is of the vertical type, there are also used rotary presses, that is, those in which the molds are rotated under the plunger.

The green bricks are loaded upon specially constructed steel cars which hold about 1,000 bricks each. The tracks from the press are continuous with those in the cylinders, so that the cars can be run directly into the latter as soon as possible after being filled.

The cylinders which are used for hydrating the lime as well as for hardening the bricks, are each massive steel drums, about 6′ 4″ in diameter, and 60′ long. When filled, the cylinder contains about 20,000 bricks, and is closed hermatically by covers at both ends. Steam is then turned on gradually and the pressure allowed to rise until at the end of two hours, the gauge registers 125°. This pressure is maintained for ten hours, at the end of which period it is again gradually lowered and the cylinder opened. The materials which lay in the sand bank 24 hours ago are ready to be used in the construction of fine buildings as a finished substantial brick.

CHEMICAL REACTION IN HARDENING. The question that interests the chemist in this process is, "What reaction takes place in the hardening cylinder?"

Silica exists in two modifications, known as active and inactive. The difference between the two consists in the solubility of the active silica in hot sod, carbonate solution. In all sands there is always present a certain amount of this active silica; by the action of the steam at high pressure, it readily reacts with the hydrated lime to form a calcium hydration which is the cause of hardening. Hence, the amount of lime to be added ought not to exceed that which is chemically equivalent to the active silica present in the sand. As in general, feldspar sand contains about 5% of active silica, the usual practice of adding about the same amount of lime is thus explained. In the very hot solution, under-pressure attacks the silica forming a calcium hydrosilicate which crystallizes out between the different particles of sand. Gradually the surface of each little particle of sand becomes converted into the hydro-silicate and thereby any further action is prevented. It is known that boiling alkalies will attack silica, and I have seen it mentioned that steam itself at high pressure will dissolve silica. As is well known, sand-lime brick may be hardened at even lower steam pressure than 125°, but the time required for hardening becomes proportionately longer

A Treatise on Dry Press Brick Making

Specially Contributed by J. W. Ball, Toronto

THE brickmaking industry is known as one of the oldest in the world. Since the time that the Israelites made bricks in Egypt under bondage, this industry has taken many various and different forms. To enumerate all of them would perhaps be a waste of time and would answer little purpose. One of the most up-to-date methods for the manufacture of bricks is known as the dry press process. This method of brickmaking has become very popular in this country during recent years. It is productive of bricks of the highest type, beautiful in appearance, high in quality, true in shape and color, and with large tensile and compression strength. Bricks made from this process are what might be termed the nobility of the brick world. A description of the process will enable anyone to understand why these bricks are of such high quality and standard.

With this method of brickmaking the material has to be prepared under the very best possible conditions. It is reduced to a fine state, like powder, therefore any foreign substance, such as limestone, must be reduced while passing through this grinding process, and by so doing become part of the brick and act as a flux to other higher materials while burning. With the roller method of grinding clay, many of these limestone pebbles remain in the brick unbroken and in many cases cause an unsightly appearance, cracks, etc.

Materials.

The material best suited for this particular process of brickmaking is of the shale variety. The color of this material is sometimes blue, red, gray, and a very dark drab. It is found in large stratified bodies in various parts of the country, varying in its degree of hardness according to the depth below the surface. This material is mined in various ways. Dynamite and other explosives of a similar character are used, and in some cases a steam shovel is employed. Its close and hard texture well qualifies this material for the making of a dry press brick.

Preparing.

The preparation of the material takes many various forms for this particular kind of brickmaking, according to the degree of hardness of the raw material. If you take a body of this kind of shale that is of a soft nature and has been somewhat exposed to the atmospheric conditions for a number of years, it is possible to take the material direct from the mine and manufacture it right into brick with very good results. In many cases with some shales this process has been found to be the very best method, owing to its regularity and even texture in its natural formation. With some shales this method is not at all advisable. It is better to allow it, after being mined, to be exposed to the atmospheric conditions for a few months before manufacturing it into brick.

Another method of treating this hard shale is by grinding immediately the shale leaves the mine and passing the material through what is known as a tempering process [illegible]. The dust, immediately it has left the grinding mill, falls by gravity from the hopper through a kind of machine that impregnates the whole with a hot moisture from steam. After that, it is taken and placed into storage bins of large capacity to allow it to mature and become suitable for the manufacture of the higher grade of brick. Another method of preparing material for this class of work may be mentioned. After the shale has passed through the ordinary grinding pan and been screened, the fine dust falls into a mixing mill constructed upon similar lines to the dry pan, where the material receives another milling similar to that usually is received in the dry pan. This second milling toughens it and aids it to withstand the pressure in the press. Material thus prepared will stand more pressure without splitting through the middle while in the press and will be considerably more dense when burnt.

The above are only one or two of the various ways in which it is possible to handle this material so as to bring about the very best results in brickmaking. There are others of a cruder character which are invariably used where a high grade of brick is not an essential feature.

Grinding Machinery.

The machine best suitable for the preparation of this particular brick is known as the dry pan. The construction of the dry pan is so arranged that it not only grinds the material but has a toughening effect. With the dry pan it is possible to add sufficient moisture to the raw material to make positive cohesiveness immediately it becomes subject to pressure. There are other grinding apparatus for the reducing of shale known as pulverizers, rotary crushers, etc., etc., but to the writer's mind and experience the dry pan far exceeds them in the good quality and preparation of shale for this particular kind of brickmaking. The dry pan is not only well adapted for this purpose but it is substantially built; and with care such as is used with all machinery, will last for an indefinite number of years under the very heaviest kind of work. These pans are manufactured in our own country and should appeal very strongly to Canadian brickmakers.

Pressing.

After the material has passed through any of the above treatments it finally passes into the press before entering the kiln.

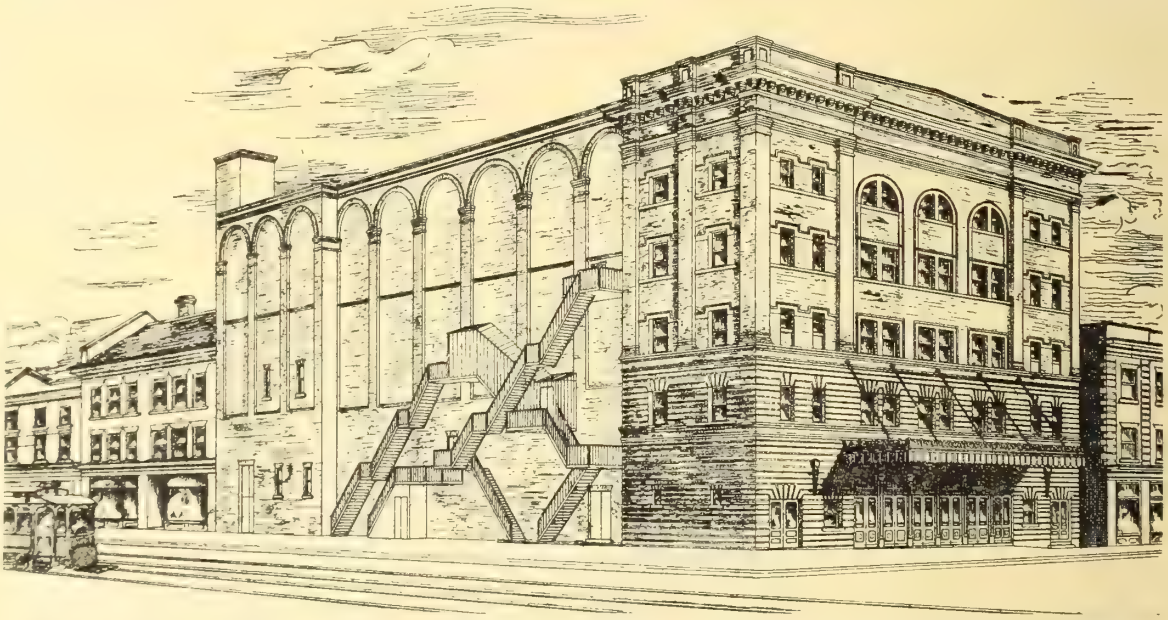
The press plays a very important part in the quality of this brick after due care has been given to the preparation of the material. In this process the press has to take the place of that chemical action, which, in other methods, is brought about by the mixture of water and raw material. Therefore it is very necessary, considering the small amount of moisture that is used in this process of making brick, that the press should be of the strongest manufacture and the best adapted, according to its movements, to bring about the solidity of the brick. In many instances, even when due care has been paid to the preparation of the material, it is finally spoiled when it comes to the press, for the simple reason that the movements of the press are not adapted to give it that even surface and density which a good brick requires. In many cases a granulated centre is the result, giving the brick the appearance of a sandwich.

The press best adapted for this kind of work is one that gives what is known as three distinct pressures, first from the top, second from the bottom, and third from the top and bottom together. The lift-out movement of the press should be such that the brick on leaving the mould, remains perfectly still, so that the bottom edges are not destroyed until the charger comes forward and removes it to the front apron ready for transit into the kiln.

Such machines as are described above are well known and are in extensive use.

Setting.

After the brick has been carefully made, an important feature is that it should be placed very carefully in the kiln and set in such a manner that it is evenly spaced on the side, with two faces and ends together so as to give the very best possible chance of bringing out a perfect face and end, free from blemish and marks of any kind. If the bricks are not properly set, it is very noticeable when they issue from the kiln; 5 over 2 is a good way, giving good faces and ends, plenty of draft, and causing the draft in the kiln to spread well.



The new Shea's Theatre, Toronto, erected this season of pressed brick. Contains 24 fire exits and model interior arrangement. Considered the best equipped building of its kind in Canada. Total approximate cost, $200,000. Architect, Charles J. Read.

Burning.

The last but by no means the least consideration is the method of burning this particular brick. After the brick has been properly made and set, it requires the services of a practical burner to bring it forth to the best advantage. The first point in burning is the water-smoking period when the small amount of added moisture is extracted. If, during this period of burning, the kiln is rushed to any extent and the temperature rises more than 212 degrees Fahrenheit, the chances are that the good work of the preparation of the material and pressing will be destroyed, as the sudden rise of temperature in this period will cause the bricks to expand, thus destroying the bond, and any amount of burning after will not bring the same solidity into the brick that would have been obtained if it had been treated properly during this period.

The oxidization period is another important factor in the burning of this brick. During this period the moisture contained in this material is taken away and the brick is prepared for that higher element of vitrification. All combustible matter is extracted during this stage; therefore it is necessary that this work be thoroughly completed before vitrification takes place. Bricks not properly treated during this period show a black or blue core when broken through and at other times a swelled appearance. This is caused by the outer pores of the brick becoming vitrified and closing up so that the combustible matter cannot escape. As a consequence, the brick are of very little value, and in many cases altogether spoiled.

Vitrification.

During this period of burning the brick is changed from a perishable to a non-perishable material. It receives during this process its stability for future years of use as a building material. It also receives its color at this time. Therefore the burner in charge should endeavor to turn out a product that will not only stand the ravages of time but have a pleasing effect upon the eye.

Drawing.

This last process, when the finished article is being drawn from the kiln and when its quality is being determined, is at all times a matter of great importance worthy of serious contemplation upon the part of the manufacturer. To produce brick in first-class condition means constant attention throughout all stages. Care should be taken in shipping to sort the bricks according to quality and color. They should be shipped in the cars with straw in the very best condition.

When the manufacturer who has been careful in all these matters looks at the finished building he will be proud to think that such bricks have been made under his care, and that they will last long after he has gone, standing as a credit not only to himself but to the industry he represented.

In conclusion, the writer wishes continued success to the industry of which he is a humble representative.

The Hollow Clay Block

Contributed by W. McCredie, Lyons, Ont.

A wall with hermetical air space, impervious to moisture, easy to construct, cheap, strong and of good appearance is an ideal wall. Such a wall is now obtainable by the use of hollow clay blocks. In these days of much experimentation with cement for solid and hollow walls, it is well to study this modification of the old clay brick.

The hollow clay block or brick is now made in a variety of shapes and sizes and is used extensively throughout the western, middle and southern states of America; also in many parts of Eastern Canada. When its advantages are considered, it is strange that farmers have been the first to appreciate these blocks and that they have been considered so little by other builders. Fifteen years, however, is possibly too short a time to allow for the general adoption of any material unless the manufacturer adopts vigorous advertising methods.

In the western states a single air space block, about 8 x 8 x 14 inches, with about 1½-inch wall, is much used. In Ontario, however, for barn foundations and other outbuildings, cold storage and cheese factories, and buildings of similar requirements, there is a general use of and sensible preference for the three-celled block. The most common size is 6 x 9 x 12 inches for such purposes, giving a 9-inch wall.

There is no reason why these blocks or similar ones of slightly different proportions should not be used for factory or warehouse construction, or for house foundations and partition walls. Where a wider wall is required, the smaller size of double or single celled hollow blocks can be used.

These are commonly used in the dimensions, 4 x 6 x 12, laid beside and parallel to the 6 x 9 x 12, then by reversing the courses, making a perfectly bonded wall of 14 inches in thickness and with five dead air spaces. By carrying out this plan, any thickness of wall may be obtained. There is another size of block being used, viz., 3 x 4 x 12, which gives a handsome exterior face to a house or factory. It is important to note the superiority of hollow clay blocks over cement (hollow) blocks and solid cement walls. The hollow cement block, despite the hollow space, is not a bar to moisture—as any one can discover by a little testing. These blocks have little to commend them beyond their claims to provide insulation. The hollow clay block wall is less liable to danger from cracking, is of better appearance, costs no more on the average and gives perfect insulation, the walls being of a kneaded and burnt homogeneous material.

Kiln Costs

I have claimed that I can construct a round down-draft kiln of 100 M. capacity as cheaply as an up-draft kiln, writes Anton Vogt, in "Brick." I have, through the clay journals, invited interested parties to furnish a bill of cost for an up-draft kiln of same capacity. So far none have responded.

In order to prove what I claim I hereby publish a bill showing the cost of material and labor for a 31½-foot kiln, holding 100 M. building brick. This includes a stack 40 feet high and of proper draft area.

70 M. common brick at cost of production, about $4.00 per M.	$280.00
3 M. fire brick at $20	60.00
2 tons fire clay	15.00
Lime, sand and cement for outside wall	40.00
Labor to lay 73 M. brick at $5.00 per M	365.00
Excavating for foundations and flues	25.00
800 feet ¼ x 1½ inch iron strips	35.00
One steel band, ¼ x 8 inches	25.00
2 steel bands ¼ x 4 inches	25.00
500 feet 1-inch wire cable (second)	50.00
Lugs, bolts, turn buckles and two rails 7 feet long for door frame, and two rods	30.00
Total	$950.00

I figure that ground-clay for clay mortar, and also the scaffolding, is furnished by the prospective builder of these kilns. In some localities such a kiln can be built even more cheaply than the cost quoted above, and in other places it may cost a little more. I guarantee to burn 95 to 98 per cent. hard brick and at least 98 to 99 per cent. salable brick, under these conditions:

I would oversee the construction, setting, and burning of the first kiln at a reasonable compensation for my time and expenses.

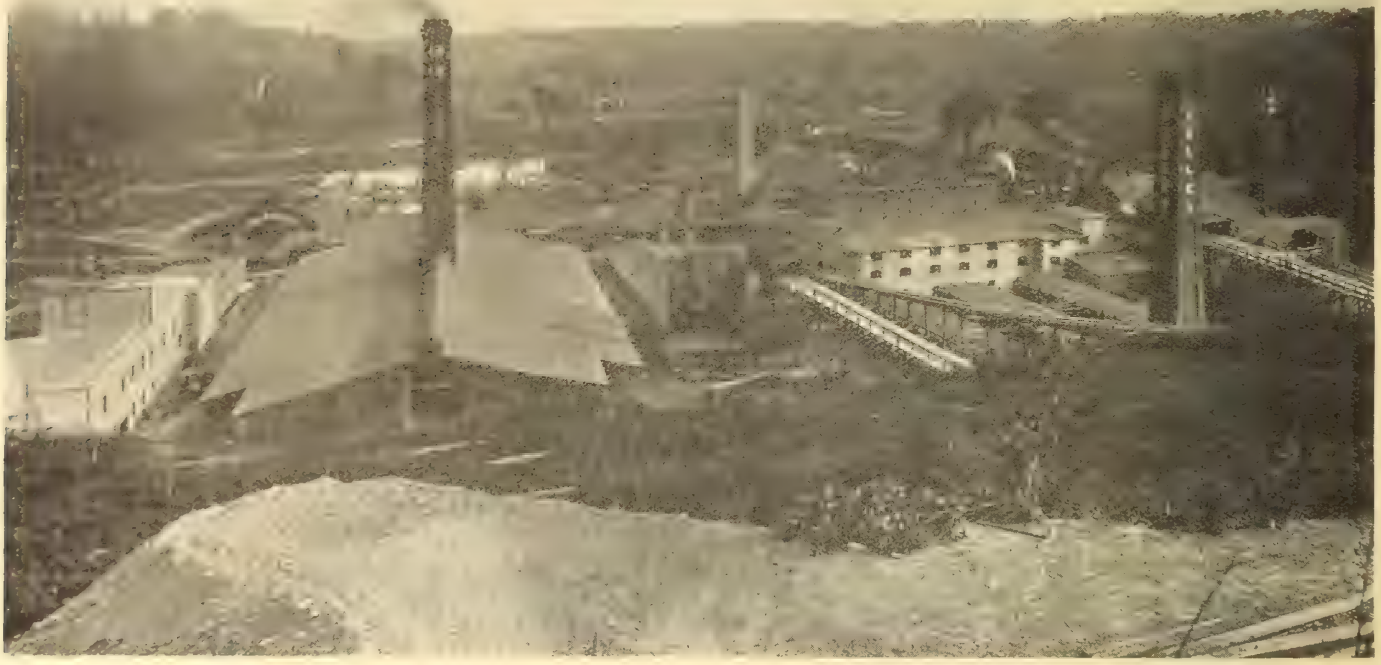
These kilns have no grate whatever and mine-run coal is used from start to finish. I do not claim to use all slack; I guarantee to burn with from 700 to 1,000 pounds of mine-run coal per thousand; and in from six to eight days for stiff-mud and in from eight to ten days for dry-press brick.

A beginner can build one or two of these kilns with unburned brick, except for the outside wall, 8 inches thick, where burned brick must be used, and the crown can be covered with burned bats and grouted. A temporary shed can be put up while building the kiln and by slow heating the first burn one will have a substantial kiln that will last for years, and a cheap one. There are some points of merit in construction and [illegible] which I cannot publish, because these points are my secrets enabling me to build these kilns so cheaply.

By proper care in setting, a high percentage of front brick can be burned in these kilns as well as in the highest priced ones. When it comes to down-draft kilns I [illegible] to take my hat off to any one, and I will do all I can to work for better brick by furnishing kilns that the poor man can afford to build and which deliver the good, hard brick.

These kilns are durable, easy to clean out, burn even from side to side and from top to bottom, [illegible] control of the burner at all times.

Don Valley Brick Works



The Don Valley Brick Works, Toronto

One of the oldest, largest and most modern brick-making plants in Canada is that of the Don Valley Brick Works, now owned by Mr. Robert Davies. Immediately on acquiring this plant, about ten years since, Mr. Davies, with characteristic energy and foresight, made extensive improvements and additions. These have been continued from year to year in order that the plant might be kept thoroughly up-to-date. The improvements of the past season, for instance, included an entirely new stock brick plant, an addition to the fireproofing plant, and four new down-draft kilns.

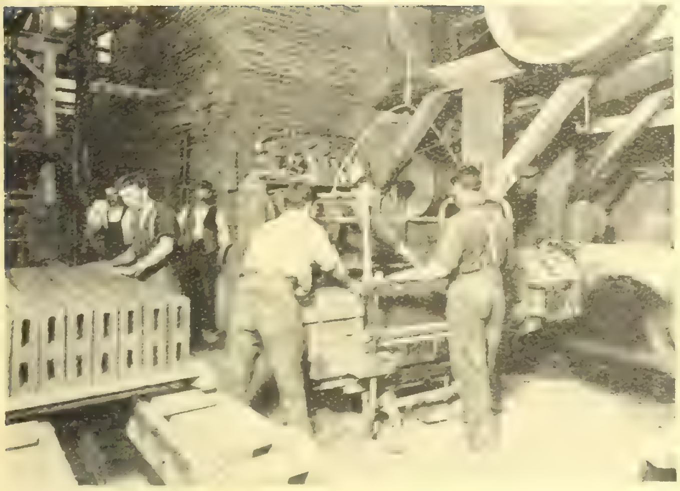
The views accompanying this article give a very good idea of the magnitude of the plant and of the diversity of its operations. Nearly everything in brick or block made of clay is manufactured, such as white stock bricks, red and buff pressed bricks, wire cut bricks, terra cotta fireproofing, porous blocks, foundation blocks, vitrified bricks, hollow tile and blocks for flues and drainage purposes, Roman bricks, arch bricks and enamelled bricks in all colors.

The clay deposits of the Don Valley Brick Works are very extensive, and, as will be noticed by the illustrations, there are exposed a variety of clays and shale which are manufactured into some form of clay product. The shipping facilities of the Company are also of the best, having connection with three transcontinental lines

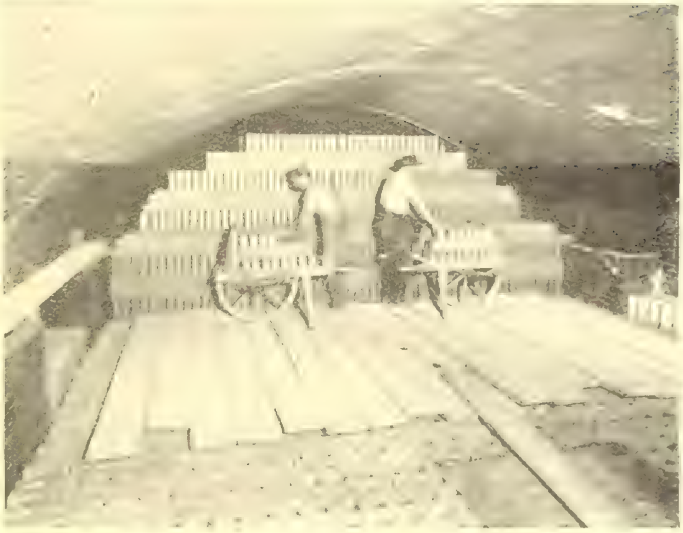
The product is marketed in all parts of Canada. The

Row of Kilns at the Don Valley Plant

Showing Presses in Operation



A Corner of the Porous Terra Cotta Department

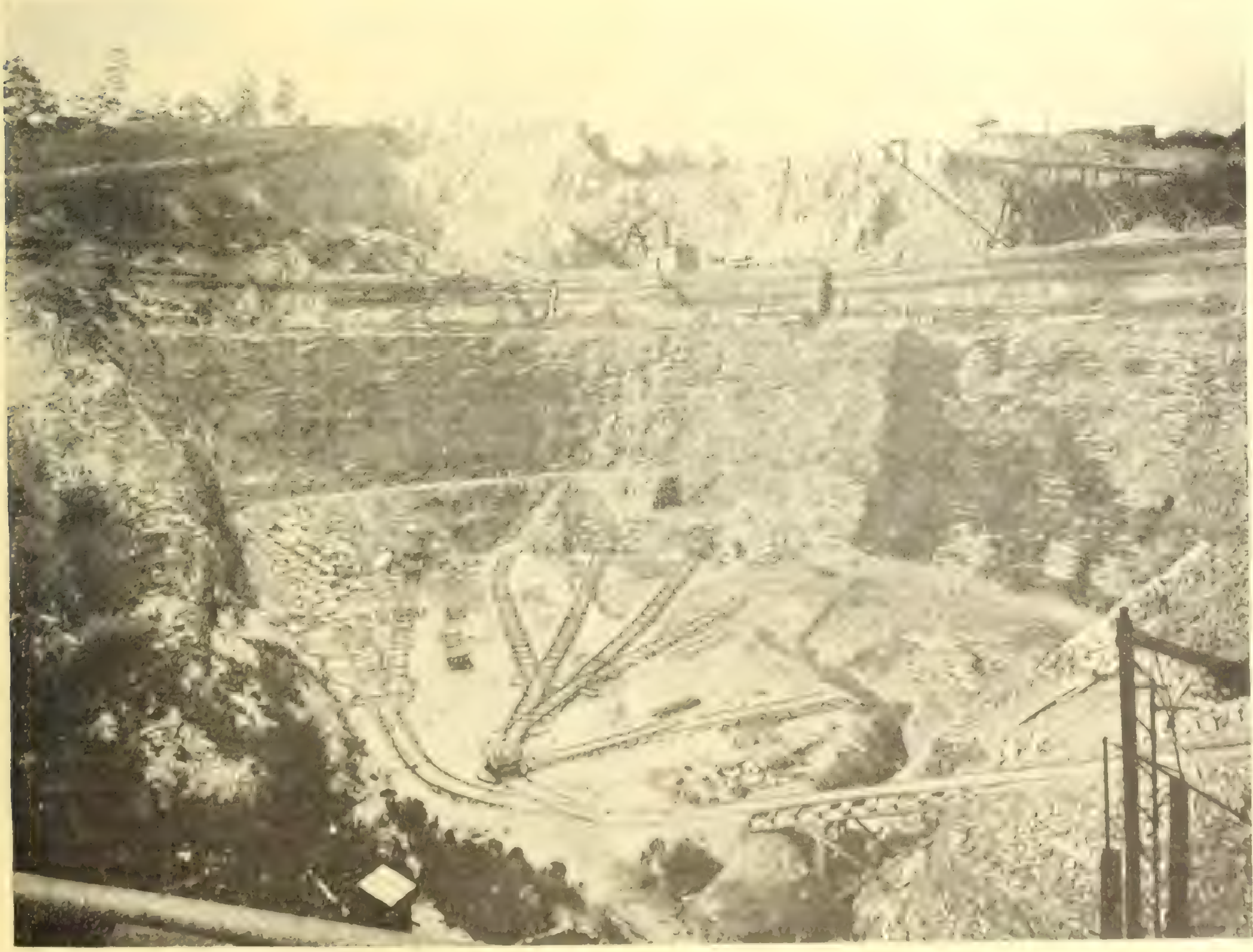


Interior of One of the Kilns

magnificent contract recently secured by the Company for the new hospital in Toronto is a testimonial to the quality of their brick.

Good management and thorough organization are among the reasons for the great success which has attended this enterprise. Each department at the works is conducted independent of the others, and there is one general superintendent over all. The General Manager is Mr. John M. Bowman, who has been connected with the establishment for nearly 20 years. He is very widely known, and to him is due in no small degree the progress which has been made.

It is scarcely necessary to mention in connection with this article that the products of the Don Valley Brick Works are known for their quality wherever they have been introduced. An exhibit of pressed bricks of this plant took the highest



View of Shale Pit and Tracks on the Don Valley property award of the World's Columbian Exposition at Chicago. Enamelled bricks have been ordered from here for important United States buildings. The terra cotta fireproofing has stood some very interesting tests. In connection with the latter product the following report made by Professor Gillespie of the University of Toronto is of special interest:—

Toronto, Ont., Mar. 23, 1910.

Mr. John M. Bowman,
Manager, Don Valley Brick Works,
36 Toronto St., Toronto.

Dear Sir,—On February 25th and 26th at the plant of the Don Valley Brick Works, I witnessed a test of a flat floor panel ten inches thick constructed of Don Valley terra cotta tile, a sketch of which showing dimensions, I enclose herewith. The panel measured 7′ 9″ x 8′ and was built entirely on the end construction plan between two 18″ steel I-beams weighing fifty-five pounds per foot. The loading consisted of sacks of cement and clay piled in tiers of twenty-eight bags each, in such a way as to approximate, as nearly as possible, a uniformly distributed load. Deflections were measured at the centre of the panel and are given in the attached table.

Load, pds. per sq. ft.	Deflection	Remarks.
78	1/40 of an inch	
117	1/32 " "	
234	1/20 " "	
273	3/32 " "	First crack observed in jointing near key.
351	5/32 " "	Crack in jointing 1/30 of an inch in width.
429	7/32 " "	
546	11/32 " "	

The load was discontinued when 14 tiers of sacks had been placed on the panel, the roof of the building not permitting of additional loading without great inconvenience. The panel in consequence was not tested to destruction.

Yours very truly,
(Sgd.) Peter Gillespie,
Lecturer in Applied Mechanics.

Port Credit's Connection with the Industry

The Home of the Port Credit Brick Company, a Progressive Concern with One of the Best Equipped Plants in Canada

A ten mile run from Toronto on the electric car, along the lake shore from Sunnyside, brings one to Port Credit, where is located the yard of the Port Credit Brick Company, used principally in the manufacture of red pressed and wire cut brick, and one of the largest and best in Canada.

The location is exceedingly good, being convenient of access from both Toronto and Hamilton, and, as may be gathered from one of the accompanying illustrations, the shipping facilities both by rail and water, are excellent. The brick are made from a mixed shale, the upper part being reddish; below this the shale is yellowish brown, and lower it is blue. The shale is blasted from the top to the bottom and is hauled by car to two pan mills; the ground shale is elevated to screens, and the oversize returned to be re-ground.

Port Credit Brick Works—General View of Plant from Rear, showing Kilns and Power Houses

The plant consists of five dry pans; two manufactured by the Waterous Engine Co. of Brantford; two by the American Clay Machinery Co., and one of the company's own design. There are three Berg dry presses, each with a running speed of 1,800 brick an hour; also one American Clay Company's No. 65 wire cut machine with a capacity of 10,000 brick an hour. Power is obtained from a 1,000 h.p. electric plant.

There are seven up-draft and six down-draft kilns and continuous kiln. The brick are wheeled from the machine directly to a Hoffman continuous kiln, consisting of eighteen chambers arranged continuously in an oval. The waste heat from one chamber passing through the adjoining chambers first dries off the brick, then, as the fire is led nearer, it heats them up; finally, the fire is led right into the new chamber, and so the process continues round the oval of eighteen chambers, so that when the fire is once kindled, it is never let out, but some chambers are being charged while others are burning, and still others are being discharged. Each chamber is capable of holding about twenty thousand brick; thus the whole kiln will burn three hundred and eighty thousand in one round; and this can be done in sixteen days, once the fire is up. The firing is done from above through small hand-holes about five inches square. A good sized handful of cracked coal is dropped down each hand-hole every twenty minutes. A large flue serving for all the chambers passes along the centre of the kiln, with a small flue connecting it with each chamber, and in the outer end of each of these is a hand damper by which the fire can be regulated from one chamber to another.

An expert analysis of the shale shows a high percentage of iron well fitted to produce the red color of the brick, together with a low percentage of lime, which, therefore, does not counteract the iron. The percentage of sulphur trioxide is very low, consequently the brick are practically free from the so-called "soda," usually found on red pressed brick.

The company specialize in the manufacture of sewer brick, a large quantity of which they have supplied for the trunk sewer construction at Toronto. This sewer brick is much harder, and consequently the absorption lower, than the aver-

Port Credit Brick Works - Method of handling Shale to both Dry Press and Wire cut Plants

ago. Other lines are hard building brick and the usual run of dry pressed brick, Nos. 1, 2 and 3.

The average daily capacity of the plant is 150,000. The approximate total output last year was 50,000,000. It is certainly no exaggeration to say that the plant is one of the finest and most thoroughly equipped in Canada.

Beamsville Brick and Terra Cotta Works

These works, operated by George Crain, formerly a well-known builder and contractor of Brockville and Ottawa, are situated in the heart of the fruit district of the Niagara Peninsula, a short distance west of the village of Beamsville, Ont., near Grimsby Beach. The clay beds consist of sixty-two acres, upon which the works are erected. The red Medina shale, which outcrops here, has the following composition: Silica, 55.90 per cent.; alumina, 18.46 per cent.; ferric oxide, 6.60 per cent.; lime, 3.82 per cent.; magnesia, 2.65 per cent.; soda, .53 per cent.; potash, 3.55 per cent.; sulphur trioxide, .31 per cent.; loss by ignition, 8.74 per cent.

Beneath the red shale is a stratum that burns to a buff color. Both of these clays are of a very fine quality, dense, and hard as a rock, requiring, if not for some time exposed to the weather, the use of dynamite or powder in order to loosen them. When, however, the shale is opened up and exposed to the weather, it becomes more or less disintegrated, so that it can be broken up with a pick-plough and allowed to slack further before being taken to the clay shed.

Port Credit Brick Works — Showing Rail and Water Transportation Facilities

After being stored in the clay shed, the material is fed into two pans or grinding mills, one of Canadian make and the other made by the Whittaker Company, Accrington, England. From these mills the clay is elevated, and screened to hoppers, the oversize returning to be reground. From the hoppers, the ground shale feeds two Simpson dry presses, from which the bricks are loaded on barrows and rolled direct into the down-draft kilns, where they are set and dried slowly under a coke fire. When thoroughly dried, the bricks are brought up to a white heat with soft coal, until they are semi-vitrified. The works turn out a very high grade of pressed brick, in red, brown, and buff colors, including a dark red flashed brick, having black or brown edges, and all forms of brick for ornamental work. The semi-dry plant has a capacity of 30,000 per day. The kilns are six in number, all down-draft, two being round and the others rectangular.

In the manufacture of plastic-made, wire-cut and paving brick, hollow brick, fireproofing and drain tile, the ground shale runs into a pug-mill, which feeds a large auger machine of German design, the capacity of which is 30,000 per day. In making side-cut bricks, thirteen are cut off at a time. They are then piled on steel cars, 550 to each car, and run into a 5-tunnel dryer, built of brick, with a capacity of 40,000. Through these tunnels a draught of hot air is forced by a fan, the air obtaining its heat by passing through arches heated with coal. Only about twenty-four hours is required to thoroughly dry the bricks, when the tunnel cars are run out on a transfer car to the kilns. The bricks are then set in the latter, and vitrified or semi-vitrified as required. The hollow brick, terra cotta, fireproofing and farm drain tile are put through the same process as are the wire-cut brick, the quantity made being in proportion to that of the wire-cut brick, 30,000 per day.

View of the Beamsville Brick and Terra Cotta Works, owned by Mr. Geo. Crain

The brick made from the shale referred to are known by leading architects and engineers all over the Dominion to be of a high grade, dense and hard, withstanding a crushing strain of from 7,994 pounds to 8,012 pounds per square inch, while the absorption test shows only from 10.6 to 10.8 per cent. This was the result of the test undergone by Beamsville brick when several millions of them were used by Messrs. Dawson & Riley, contractors, in the Canadian Niagara Power Company's tunnel at Niagara Falls, Ont. (Mr. C. B. Smith, chief engineer). The same grade was also supplied Messrs. Haney & Miller, contractors for the tunnel under the Bay at Toronto, under the direction of the City Engineer. Beamsville flashed pressed brick were used in the new station on the G. T. P. and T. & N. O. at Cochrane (Mr. John M. Lyle, Toronto, architect).

General View of the Milton Pressed Brick Company's plant. Note the Siding which holds twenty-five cars

Progress the Watchword at Milton, Ont.

An Industry which has just "Come of Age"—A Brief Description of the Plant of the Milton Pressed Brick Company

The Milton Pressed Brick Company's plant, of which Mr. J. S. McCannell is vice-president and managing director, is situated just outside the town of Milton, Ont., and has been in operation for about twenty-one years. Red and buff pressed bricks are manufactured, as well as several varieties of fire flash effects in both red and buff colors. A specialty is made of fireplaces, these having a ready sale through different parts of Canada.

The Medina shale which is worked from the bank with a fifty-foot face, runs in layers of red and buff alternately. The shale is blasted out with dynamite and hauled in cars to dry pans. The material is then ground in these pans, being tempered to a slight dampness just sufficient to let it through the screens, which makes it as fine as flour. A large hopper just above the press carries the supply of ground material. Five Boyd dry presses are in operation. These machines have a capacity of 18,000 to 20,000 bricks each, per ten-hour day.

Portion of Press Rooms where five 4-mould Boyd Presses are working

The bricks are run directly to the kilns where they are water-smoked with wood for about ten days, after which they are burned with coal for about a week. The kilns, of which there are eleven in number, are all, excepting two, of the down-draft rectangular type, and hold two hundred thousand bricks each. The plant is very conveniently situated for loading. A siding holding twenty-five cars runs along the front of the plant, where the bricks are wheeled in from the level of the cars.

This plant has been running summer and winter for many years, and a staff of nearly one hundred and twenty-five men is kept the year round. Twenty men are kept continually loading cars, which are shipped out over the C. P. R. whose main line runs through the plant. The company also ship over the G. T. R., the cars being switched down to the "Y" which is but a slight distance from the plant.

A Busy Spot at the Milton Plant

An Up-to-Date Plant Near Georgetown, Ont.

There are three main points that one must take into consideration in formulating an idea of the successful operation and in making a forecast concerning the possibilities of the future development of a pressed brick industry, granted, of course, that there is a fair market for the company's products.

In the first place, there must be an abundance of good shale available for working; secondly, there must be adequate transportation facilities at hand, and thirdly, the management must be aggressive, progressive, and experienced.

Judging by these standards there is every reason why the Terra Cotta Pressed Brick Company, Limited, of Toronto, should feel optimistic. They have an excellent property of 160 acres on the outskirts of Georgetown, Ontario, 35 miles from Toronto, where, so far as this and a score of other generations are concerned, there is an unlimited quantity of

Toronto Pressed Brick and Terra Cotta Works at Milton, Ont.

material in sight. There are splendid shipping facilities, the works beng located on the Allandale branch line of the G.T.R. Excellent water power is available on the Credit River. The up-to-date electrical equipment at this plant was installed by the Westinghouse Company. At the present time a number of important extensions are being made at the works. When these are completed the capacity of the plant will be greatly increased. The company are employing the American system of down-draft kilns. The presses were supplied by the Berg Machinery Company.

There is a good call for the firm's products, the company having a big shipping territory throughout the provinces of Ontario and Quebec. The plant has only been running three years, but the material therefrom has already made a reputation in building circles.

The Toronto office of the company is located at 37 Yonge street and is in charge of Mr. D. A. Burns, general manager.

Toronto Pressed Brick and Terra Cotta Works

A pressed brick plant, which is probably the pioneer establishment of its kind in Canada, is located at Milton, Ont., on the main line of the C.P.R., 33 miles west of Toronto, and owned by the Toronto Pressed Brick & Terra Cotta Works. The company's property at Milton is an extensive one, covering an area of 103 acres. There is an excellent deposit of Medina red shale, one of the finest in the province, or for that matter, in the country. The clay bank now being worked by the company is shown in one of the accompanying illustrations.

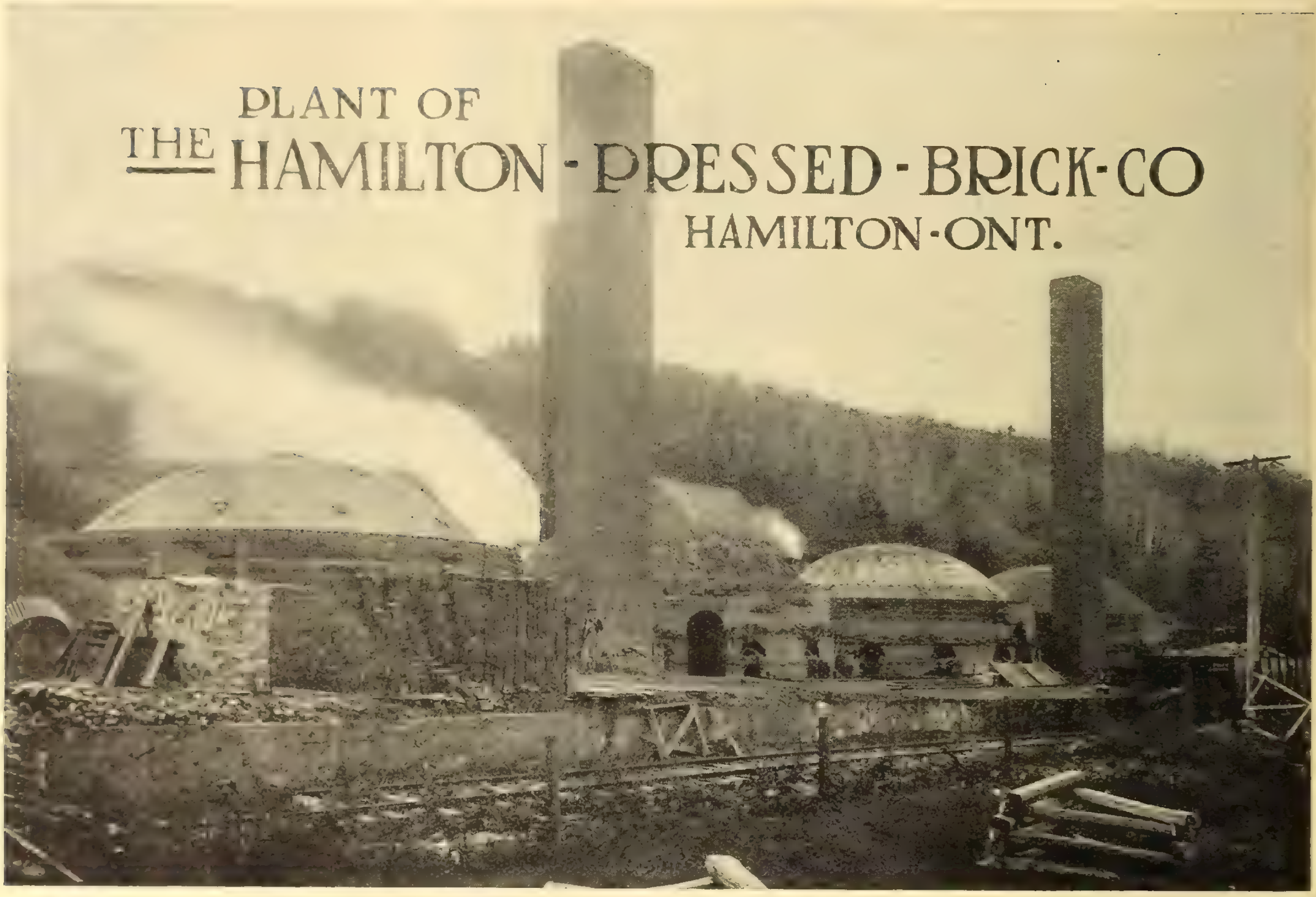
The plant is equipped with the most modern machinery, including five dry-press brick machines of the latest design. It is capable of turning out twelve million bricks a year—a capacity which is now being taxed to the utmost.

In addition to a high grade red pressed brick, the company manufacture architectural terra cotta roofing and flooring tiles, cresting, finials and chimney tops. Recent noteworthy contracts for the company's brick have been with the Cockshutt Plow Company, Brantford; Mammoth Knitting Company, Dunnville, Ont.; and the Massey-Harris Company, Robert Simpson Company, and the Toronto Carpet Manufacturing Company, of Toronto.

The head office of the company is located at Milton, Ont. Mr. C. J. Lewis is the proprietor of the concern and his son, Mr. C. B. Lewis, manager of the plant. The Toronto agent is Mr. John D. MacDonell, 19 Yonge Street Arcade, and the Montreal agent, Mr. E. F. Dartnell, 157 St. James street.

The Dominion Sewer Pipe Co., Swansea, Toronto, is erecting a brickmaking plant at Waterdown, Ont

Clay Bank on the Property of the Toronto Pressed Brick and Terra Cotta Works.



Hamilton Pressed Brick Company, Limited

The plant of the Hamilton Pressed Brick Company, Limited, which is located on the outskirts of Hamilton, Ont., is entitled to particular mention on account of the wide market for its products that has been created in something less than three years.

The company was organized early in 1908 by Messrs. Henry New and Robert W. New. The latter, who manages the plant, has an intimate knowledge of practical brick making, and under his capable management the works have been operated with the greatest success. The company is working a superior and practically inexhaustible deposit of red shale clay just inside the eastern limits of the city. One of the most notable features of the plant is its excellent transportation service, the works being located on the main line of the Toronto, Hamilton & Buffalo Railroad, which connects with the C.P.R., M.C.R. and G.T.R. From the plant to the company's office in the Spectator Building, which is situated in the heart of the city, it is only a fifteen-minute run on the Hamilton, Beamsville & Grimsby electric car.

A Section of the Inexhaustible Shale Property of the Hamilton Pressed Brick Company, Limited

In the manufacture of Hamilton pressed brick, the shale is crushed in a dry pan and screened down to a Berg press, after which the bricks are set in the kilns and burned for about two weeks. There are four down draft brick kilns, each with an approximate capacity of 140,000 brick. The bricks are unloaded from the kilns right onto the railroad cars, as may be seen from the larger illustration. This is facilitated by the construction of the kilns, which have an entrance next to the press and an exit door adjoining the tracks.

The accompanying photo conveys some idea of the resources of the company's property. The depth of the shale bank varies from 30 to 80 feet, and the property has a frontage on the railroad of the best part of a mile.

The bricks of the Hamilton Pressed Brick Co., Ltd., have been specified for a number of important buildings, among which may be mentioned the collegiate institute, Brantford, Ont.; collegiate institute, Grimsby, Ont.; new public school, Goderich, Ont.; hydro-electric power stations at Dundas and Woodstock, Ont.; apartment house, London, Ont.; large addition to factory of Cockshutt Plow Co., Brantford, Ont., and the Oliver Chilled Plow Company's factory at Hamilton.

The firm's shipping territory extends over a wide area from Sault Ste. Marie, Ont., to Halifax, N.S.

With a practically unlimited supply of high grade red shale, unexcelled transportation facilities and an experienced and progressive management, the Hamilton Pressed Brick Company are sure to make rapid advances during the next few years. The annual capacity of the plant, at present, is between 4,000,000 and 5,000,000 bricks. In the near future this capacity will be greatly augmented. Even now the company is contemplating extensions that will double the output.

Few clay working concerns have had such a uniformly successful run of business as the Hamilton Pressed Brick Company, Limited. This is due largely to the fact that the president and vice-president have had a long and valuable practical experience in the clay working trade. It will be within the recollection of many of our readers that for a quarter of a century Mr. Henry New was head of the Hamilton and Toronto Sewer Pipe Company.

A Flourishing Brantford Industry

The fame of the city of Brantford, one of the foremost industrial centres in the Dominion, as a natural outcome, has become world-wide. One of its successful concerns is that of the Schultz Brothers Company, Limited. This industry has been established over forty years and is well known in contracting circles. One of the most recent additions to this company's extensive industry is their silica pressed or sand lime brick plant.

It was in the spring of 1907 that this plant was installed, a splendid stretch of sand banks having been secured. This put the Schultz Company in a position to supply from their own products, the materials necessary for a structure from start to finish.

The accompanying illustration of the plant shows a portion of the sand bank, the process buildings, and the piled up product. The equipment of the plant is complete and up-to-date, and the different machines entering into the process are conceded to be the best of their several kinds in existence. The minimum capacity is 20,000 bricks a day. One feature of the process which puts silica brick on a plane reached by themselves is the short time required from when the sand leaves the bank and the lime the bins, until the bricks are piled up or transported. Twenty-four hours covers the entire process, the bricks being made and ready for use in one day.

We wish to draw attention, in passing, to one particular virtue of these brick. At the Schultz plant a well had to be excavated to take care of the condensation from the cylinders. This well is lined with sand lime bricks laid up loose. One of these bricks was removed after having been subjected to steady contact with the hot water while the plant was in operation, and after the bricks had passed through two winters of freezing. Upon inspection the brick was found to be none the worse for the ordeal,

View of the extensive plant owned by The Schultz Brothers Company, Limited, Brantford, Ont., showing Silica pressed brick plant (left background), planing mills and lumber yard in fact, it was as hard as flint. This is a good example of the density, strength and low absorption of silica pressed bricks.

The Schultz Brothers Company are to be congratulated upon the rapid strides they have made during the four years in which they have been in the brick business. Their make of bricks has become popular all through the western half of the province, shipments having been made from Toronto in the east, to Lake Huron in the west, as far nort has Port Elgin and down through the Niagara Peninsula. A number of the largest factory buildings, schools, churches and residences in the Dominion have been erected with Schultz silica bricks. Each successive season has resulted in a pleasing increase in the total number of bricks sold. It has been found necessary to keep the plant running on into freezing weather in order to supply the demand. The sales for 1910 will run considerably over the four million mark. This condition of affairs is due in no small measure to the fact that only A1 bricks are turned out, quality being the first thing studied. The shipping facilities, too, are such that prompt delivery can always be assured, a private siding connecting the plant with the G.T.R. Deliveries can also be made over the T.H. & B., M.C.R. and C.P.R. Approximately 700 car loads of the firm's output are handled in a year.

In the ordinary course of events, should the production of this plant run in proportion to previous years, extensive additions will have to be made in the near future

New Ontario Concern's Good Product

Topographically speaking, nobody ever accused Sudbury of being level, but its squareness must be admitted. From a post in the centre of the town, lines radiate one mile each way to the cardinal points. These lines form the diameters of the square which encloses the townsite. Just over the southern limit, on the Soo Line, are situated the works of the Sudbury Brick Company.

Their clay is an extensive bank of clean, rich Saugeen, the top eight to ten feet being weathered. This top weathered strata starts at the grass roots and makes an excellent red brick. The clay analysis is as follows: Silica, 63.20 per cent; alumina, 15.75 per cent.; ferric oxide, 4.67 per cent.; lime, 4.32 per cent.; magnesia, 2.73 per cent.; soda, 1.71 per cent.; potash, 2.80 per cent.; sulphur trioxide, .04 per cent.; loss by heat, 4.35 per cent.

The clay is mined in benches, which gives an even mixture of the full face, and is drawn by cars to the machine up an inclined trestle 500 feet long. This trestle is high enough to permit the car to dump its load directly into the machine, which moulds twenty-five thousand bricks a day. The green brick are then racked on Sheldon cars and transferred into a 5-tunnel dryer. The fan was bought two sizes larger than was usual for this size of dryer. The wisdom of this selection was soon evidenced by the splendid results obtained.

Sudbury Brick Company's plant, looking west

The brick machine and hoist are run by a 75 h.p. Leonard engine, and the fan by a 15 h.p. portable engine, both being fed by a 100 h.p. boiler. This arrangement permits the shutting down of the main engine at night. During the day the exhaust steam from both engines is condensed in the heater, the hot water being returned automatically to the boiler. At night the exhaust steam from the fan engine is augmented by just enough live steam to form a complete condensation in the coils. From the dryer the brick are moved on the same cars to the kilns.

The company heretofore have always burned in scoved kilns, but owing to the nature of the clay, 20 per cent. has been lost in burning. They are now adopting a system of down draught kilns, one of which is already erected. Others will be proceeded with as soon as the spring opens. The kiln ground is served with a spur and shipments are made either by car or wagon.

Sudbury Brick Company's Plant, looking east

The company is composed of the following gentlemen: A. B. Gordon, Toronto, president; A. P. Turner, Copper Cliff, Ont., vice-president; L. O'Connor, Sudbury, secretary; N. T. Hillary, Toronto, treasurer; W. A. Evans, Sudbury, manager.

The works are under the direct superintendence of Mr. Jno. Hymas, whose early ceramic education was obtained on the banks of the Don.

National Fire Proofing Company of Canada

Experts have tested clays in the vicinity of Toronto for the past three years but have found nothing suitable for the manufacture of hollow tile fireproofing. Local clays all carry too high a percentage of lime to make fireproofing conform to modern specifications.

The National Fire Proofing Company of Canada have purchased about 150 acres of land situated between the Waterdown Station on the G.T.R. and Hamilton, on which has been found a large deposit of very pure and plastic red-burning clay, which after exhaustive tests they found would make a high grade tile for general fireproofing and structural uses. It is essential in the manufacture of terra cotta fire proofing that the material be thoroughly burned, and without vitrification, as either imperfectly burned or vitrified tile is not suitable for fireproofing purposes.

The plant will be composed of several factory units. Factory number one will be equipped with dryer and kilns of the most approved type, and will have a capacity of fifty thousand tons of hollow tile per annum. This will be in operation in March, 1911. The other factories will be equipped and put in operation as the company's business expands. Factory number one will cover eight acres, and will be constructed with steel frame and hollow tile walls and roof.

The National Fire Proofing Company of Pittsburg have taken a substantial interest in the Canadian company, which will be fully equipped to carry on the manufacture of terra cotta hollow tile and also for general contracting for fire proofing construction.

A Well Known Machinery Plant at Parkhill, Ont.

The brick and tile machinery plant of H. C. Baird, Son & Company, at Parkhill, Ont., was established nearly half a century ago by the late Hugh C. Baird, who carried on a successful business in the manufacture of agricultural implements until 1895, when he bought the Canadian rights of the well-known patent Kells combined brick and tile machinery. Since then the firm has made a specialty of brick and tile machinery, besides carrying an extensive line of brick yard supplies. The concern was reorganized as a joint stock company under the style of H. C. Baird, Son & Company, Limited, in 1906. Their policy has always been one of progress and improvement, until now they claim to have the largest line of soft mud and semi-dry clay machinery, together with one of the best equipped plants in the Dominion.

In the Province of Ontario alone there have been sold over 350 Kells machines, nearly all of which are in successful operation at the present time. The company claim that 85 per cent. of the agricultural drain tile made in the province are manufactured on their machines. Of the soft mud machinery manufactured by this firm may be mentioned the iron and steel Quaker brick machine, operated either by steam or horse power. This machine has a capacity of from 10,000 to 30,000 brick a day. The Monarch and the Martin machines, the latter of which is now known as the Parkhill Martin A brick machine, have both made excellent reputations. Each has a daily capacity of from 30,000 to 50,000 brick.

The company manufacture a full line of iron and steel pug mills, clay mixers in all sizes, winding drums, automatic dump cars, wheel barrows, trucks, brick moulds, sanding machines, furnace doors, cast iron plates, grates, kiln bands and kiln irons of all kinds, shafting, pulleys, hangers and leather, rubber and canvas belting. They also handle new and rebuilt boilers and engines, suitable for brick and tile yard purposes.

The company are on an excellent financial basis, which enables them to buy in the best markets. This fact, combined with their economical production at Parkhill is accountable for their close quotations in all lines. The firm's products are known from coast to coast, the entire territory having been apportioned to the firm's travellers. The company's new business calendar and catalogue for 1911 may be obtained on application.

The Work of the Canadian Clay Products Manufacturers' Association

The Canadian Clay Products Manufacturers' Association was inaugurated some seven or eight years ago and held its first two meetings at London, Ont. The succeeding conventions were held at Waterloo, Toronto, Hamilton, Ottawa, Brantford and Chatham. The work of the Association is practical and helpful. Probably in no other industry is the co-operation of its members so essential as in the various branches of clay working. It is not too much to say that there are no two banks of clay from which identically the same results are produced in moulding, drying or burning, and the interchange of experience and technical knowledge is most beneficial. The main object of the Association, as defined by one of the most prominent members, is "to find out how to make the best article for the least money." The clay workers are fully alive to the value of adequate technical training and for some time a special committee of the Association has been endeavoring to interest the Government in the establishment of a ceramic school. That their efforts have not been entirely in vain may be gathered from the fact that the Government appointed a commission composed of Professor Ellis, Toronto University, Mr. S. J. Fox, M.P.P., and Mr. W. McCredie, President of the Association, to visit the ceramic school established by the Ohio State University. A number of useful pointers were obtained across the border and a special report was duly placed before the Board of Governors of Toronto University and the Minister of Education. So far, no definite action has been taken by the authorities. This is due not to lack of effort on the part of the Association but rather to the failure of the authorities to appreciate adequately the extent and importance of the industry. When it is considered that many of the States of the Union have established clay working schools and that large appropriations are being made annually for their maintenance, it is a matter for astonishment that such a school was not established in Canada years ago. While the apparent results of the efforts made in this connection by the Canadian Association are small, much useful work has been accomplished. A permanent impression has been made, and it remains only for the Association to keep pegging away until they gain their end. With this object in view alone the existence of the Association is amply justified. But no justification is necessary, for it is regarded almost as a sine qua non by the trade in the interests of which it operates.

MR. W. MCCREDIE, Lyons, Ont., President of the Association

Montreal Terra Cotta Lumber Company

The Montreal Terra Cotta Lumber Company have recently purchased a 45-acre site at Lakeside, near Montreal, and will remove their plant at present situated in Maisonniuve. The plant will then consist of five kilns and will be driven by electricity, power being derived from Stawanigan Falls.

A large number of buildings around Montreal and vicinity are built of terra cotta supplied by this firm. Among those are: Royal Victoria Museum, Ottawa; Earl Grey School, Montreal; Sarah Maxwell School, Montreal; Technical Manual Training School, Montreal; Quebec "Telegraph" Building, Quebec; two of the McGill University Buildings; Government Technical School, Quebec; Museum, Laval University, Quebec; the Trust and Laval Building, Montreal, and many others. The firm's output last year was over 20,000,000.

Many things can be said in favor of terra cotta. It is not only absolutely fireproof but is also more nearly soundproof than any other solid construction can be; it carries the lowest insurance rates; is a better fire and water resisting material than dense or semi-porous tiles, and is therefore the most desirable for floor arches, partitions and numerous other purposes.

Brick Resources of the Federal Capital

Interesting Facts Concerning the Supply and Demand at Ottawa —The Principal Concerns, their Equipment and Output—Trade Notes

Correspondence of the Contract Record

Ottawa is particularly a city of brick. A few of the residences, as well as the government buildings, are of stone, but the mass of structures, both residential and commercial, are of red or white brick. In spite of the preponderance of this kind of building there is very little other than the common veneer clay brick or silicate used in dwelling construction. There is no plant in the city, or very near it, where pressed brick is manufactured, and what is used has to be shipped a considerable distance.

At a meeting of the clay manufacturers a few years ago in this city, it was claimed that Ottawa producers made too good brick or not good enough. The explanation was that while no pressed clay brick was made the common brick was unusually good.

The production capacity of the brick plants within or at the borders of the city totals about 18 to 20 million a year. The largest producers are the Silicate Brick Company, of Ottawa, the Ottawa Brick Manufacturing Company, and the Peerless Brick Company—which has just come under the management of the Merckley Brothers, of Casselman. Another company, operating at Russell, has been organized to produce shale brick for the Ottawa market.

Brick ranges in price all the way from the best clay common brick at $21 a thousand to $8 a thousand delivered within the city limits. Manufacturers pay their men with teams $1 per thousand for delivering the brick in all parts of the city.

The demand for brick this spring and summer was the largest, it is believed, in the history of the city. The local producers were unable to cope with the requirements, and a certain amount of building was held up for some time on account of the scarcity. It also resulted in other towns of the Ottawa Valley pouring car loads into the local building districts.

The demand for next spring has every evidence of being greater than that of this year. The Blackburn building, tenders for the construction of which have been called for, will eat up about 1½ or 2 million. The expectations are that the Government departmental building on MacKenzie avenue will be started early in the spring. One or two industries, and perhaps more, are also preparing to erect plants in the spring. These things, added to the general building, ought to produce a big demand. To meet this there is very little brick, comparatively, in the local yards. The Ottawa Brick Manufacturing Company has sold out its supply entirely and the Peerless has very little, if any, on hand. These firms do not manufacture in the winter. The Silicate plant has a larger supply yet in its yards and can manufacture all winter. It is, therefore, anticipated that the supply in the early spring will be none too plentiful. However, once the plants get going, particularly the Peerless, they will be able to produce much more than last year, so that the shortage should not last long.

One of the big users of brick this summer was the Chateau Laurier (The Grand Trunk hotel). It took about 2,500,000, all of which came from Casselman. This was utilized for backing up the stone which forms the outside of the building. Hard red common clay brick was used.

The Ottawa public school board produced an extensive demand on account of its two big schools, built in Ottawa South and Breeze Hill. These two buildings took about 800,000. The Westboro' public school, just outside the city, took about 200,000, and the Eastview school about 200,000. All of this brick, with the exception of that used in the Eastview school, was supplied by a local firm.

The Hope building, now in course of construction, will take about half a million brick. About 175,000 for the interior walls is of terra cotta (red), purchased from Weiser & Sons, Arnprior. The remainder was silicate. The Rideau Club House, nearing completion, took about 300,000 silicate brick. The fronts on all the sides facing the streets are of cream terra cotta, of English production.

The corporation used about 200,000 brick in sewer construction. The Matthew Building is to be faced with enamel brick from the Don Valley Brick Works. This will extend over two sides. The Canadian Life Building, completed in the spring, used about 100,000, and the Rosenthal Building about the same amount. Both these buildings will have facades of terra cotta imported from Great Britain. The big Westminster apartment house was faced with pressed brick from the Milton Brick Works. The National Paper Box factory, just completed, has half a million brick in its walls, and the Slinn-Shouldis bakery will use nearly as many. The latter has been started quite recently.

The Ottawa Brick Manufacturing Company, Limited, produced about 6½ millions of clay brick this summer. It has one plant in Ottawa East and one at Hog's Back, just outside the city. Next year the company expects to produce over seven million, when the Hog's Back plant is running more smoothly. This plant has three machines, operated by steam, and the Ottawa East has two machines, operated by electricity.

A Description of Canada's First Silicate Brick Plant.

J. A. Bullman, Manager Silicate Brick Works

A very popular brick in Ottawa is the silicate. The local firm, the Silicate Brick Company of Ottawa, Limited, will produce this year about eight millions. This was the first silicate brick plant to be built in Canada and began operations about eight years ago. Silicate, or sand-lime brick, are produced by the chemical action of high grade lime and pure sand, under a high steam pressure. Pure sand, when brought into contact with hydrated lime (calcium hydrate) and water under the influence of a high temperature, produces a silicate of calcium. This compound, like all other silicates, becomes a very hard substance, particularly with age, and is claimed to be less affected by frost and water than other brick. It possesses great crushing resistance. In a recent government test, in connection with the construction of the new Ottawa Y. M. C. A., silicate brick crumbled at 83,920 pounds pressure, and clay brick used in the construction at 67,200 pounds. The silicate brick resembles Indiana limestone and can be made any color by the addition of pigments. It is different from natural stone, however, in that chemical action is uniform throughout.

The Ottawa plant is situated on the bank of the Rideau canal within the city limits. It secures its lime from the Wright Company, Hull, in stone shape. Clean bank sand is used. It is contracted for and brought from a bank at Black Rapids, on the

Plant of the Silicate Brick Company of Ottawa, on the Rideau Canal. The two smoke stacks are from boilers which produce steam for drying and hardening. The plant itself is operated by electricity.

Rideau river. It is transported in barges seven miles to the works. About 20,000 cubic yards of sand is used in the manufacture of eight million brick. The lime is hydrated one day and used in the production of brick the next.

The sand and lime are mixed in a mechanical mixer. The proportion varies with different qualities of lime or sand, but is usually about four parts sand to one part lime. The mixture is transferred to the presses, where every two brick are subjected to a pressure of 125 tons. Each press has a capacity of 36 brick a minute. This plant has two presses and the normal output is 34,000 per day. The management allow a bonus of five cents per thousand for each man in the works for any amount over the 34,000 produced in a day. The brick, after coming from the presses, are piled on cars (about 900 on each car) and passed through cylinders filled with steam. This part of the manufacturing is done at night. The brick are submitted over night to a high steam pressure, and when taken out in the morning are dry and ready for use. Although very warm they may be piled in the snow without deteriorating results. Electric power is used throughout, even in unloading the sand from the barges. About 35 horsepower is used. Twenty-eight men are employed in the works, not including teamsters.

There are no hard and soft classes of silicate brick. There is, however, a second class sold, which is of bricks that are less regular, used for interior work. The natural color is greyish white and this color is therefore cheaper than the colors produced by adding pigments. The prevailing demand is for white or dark red.

The marked growth of the silicate brick business in Ottawa has shown that in the three requisites, style, durability and price, the product is right. During the first year that the present manager, Mr. J. A. Bullman, had charge of the plant, that was in 1905, there were 750,000 brick sold. This year more than 5,000,000 have been disposed of. The capacity of the plant was doubled this year and the management will be able to cater to the outside trade in the future.

In most of the largest of the more recently erected buildings in Ottawa, this brick was used, such as in Bennett's Theatre, Canada Life Building, Canadian Building, Hope and Rosenthal Buildings now in course of construction, Rideau Club, Family Theatre, Matthew Building, and the new fire hall. The brick ranges in price from $8 to $11 per thousand, delivered throughout the city.

The Peerless Brick and Tile Company did not produce as much brick this year as usual. It began the season manufacturing wire-cut brick, which did not prove satisfactory, and the company reverted to its former methods. However, the entire plant and equipment has been sold out to a local syndicate and it is expected that the output will be doubled next year.

Fire Brick for Building Purposes

Fire bricks are coming more and more into use for building purposes throughout this country, architects and contractors specifying them for construction work, particularly in large buildings such as hotels, theatres, churches, public halls, etc.

Of the different fire bricks on the market at the present time, those of the "Glenboig" and "Gartcosh" brand, manufactured by the Glenboig Union Fire Clay Company, Limited, of Glasgow, Scotland, are well known to leading architects and contractors. Many buildings in different parts of Canada attest to their superiority. Notable among these are the Chateau Frontenac, Quebec, which was constructed entirely of Glenboig fire brick.

In 1836 "Glenboig" brand fire brick was first placed on the market. Since then the demand has steadily increased, until now in all large centres of the world the brands are to be found in some of the largest construction.

A high degree of infusibility is possessed by the "Glenboig" and "Gartcosh" brick. Another good quality which they have is that of suffering practically no expansion by heat or contraction by cooling, in consequence of which they neither crack nor fall out of the position in which they have been built. The practical test in the furnace is the only reliable one, and it is on that test, with years of experience that the fame of Glenboig rests, and which accounts for the great extensions of the Glenboig Company's business, now the largest of its kind in Europe.

Alex. Gibb, 13 St. John St., Montreal, is the selling agent for "Glenboig" and "Gartcosh" brand fire brick. They are also stocked by all leading dealers throughout the country.

The Jameson Lime Company, of Renfrew, Ont., have lately purchased the two brick industries in Renfrew formerly owned by the Renfrew Brick & Tile Company and F. Hillyard. The Company is now operating the three plants, giving employment to over 80 men. The Renfrew lime manufactured by this firm for so many years is well known to contractors and has a wide sale from Fort William east. The proprietor, Mr. J. A. Jameson, intends making an additional feature of brick and tile.

Mr. R. Forke, reeve of Pipestone, Man., has been elected president of the Manitoba Union of Municipalities. The next annual meeting will be held at Brandon.

Rapid Development in British Columbia

Manufacturers Making a Determined Effort to Supply the Needs of the Home Market — The Clayburn and other Leading Plants

Correspondence of the Contract Record

The momentous progress made by British Columbia during the past few years has far surpassed the expectations of most firms engaged in manufacturing for the supply of the home market, the result being that the output in all lines has been entirely inadequate. When possible the deficiency was supplied by placing orders with Eastern manufacturers, but in the case of various lines the product could not bear the transportation charges, and recourse was had to United States manufacturers, Washington, Oregon and California dealers reaping a rich harvest of orders.

Take the case of brick, for instance. Twenty years ago there were comparatively few brick buildings in British Columbia, hence little attention was paid to spying out possible deposits of brick-making clay. As time passed and a small demand developed, it was supplied mainly by the hand-made article, but later on a number of small capacity steam plants were started up here and there, the trade being entirely local, the quality poor, the price excessive, and the supply always an unknown quantity. When Vancouver and other towns took on healthy growth, and brick business blocks began to replace the frame structures, facing and common brick had to be procured from Seattle, while the fire brick required by the growing industries had to be secured from the old country. Then a number of large contracting firms established plants for the manufacture of common brick, several companies got busy and ordered expensive brick-making machinery, and the number of Chinese engaged in hand-moulding operations was doubled and trebled, yet still the importations grew in volume, owing to the increasing scope of the building operations and the substantial class of buildings being erected.

Pitt Lake Brick and Cement Company's Plant

To-day—twenty years later—the situation is very similar, so far as the market supply is conerned, but it would be unfair to place the blame upon the shoulders of the manufacturers. They are making determined efforts to supply the deficiency and keep the people's money at home, but in several instances have been hampered in their schemes for enlargement by lack of capital. Large brick plants are very costly, and unfortunately two or three hastily-planned enterprises of the kind proved unprofitable for the shareholders, the result being that capital for a time was difficult to secure. However, the industry may now be said to be on a first-class footing, and very soon the combined output will render importations entirely unnecessary. The Clayburn Manufacturing Company, making high grade pressed brick in four colors, fire brick unexcelled by the best Scotch, as well as paving and common, has already attained an output of 55,000 per day—soon to be increased to 75,000; the Anvil Island Brick Company is about ready to commence operations with a daily output of 30,000 pressed red; and the Pacific Pressed Brick Company, Beach avenue, Vancouver, are having a Steger System plant installed, the daily capacity of which will be about 40,000. This will be in operation in the course of a few weeks.

Some of the principal plants manufacturing common brick are: Port Haney Brick Company, Port Haney, on the Fraser river; John Coughlin & Sons, near New Westminster; Victoria Brick Company, Vancouver Island; Port Moody Brick Manufacturing Company; Silica Sand Lime Brick Company, Vancouver Island; Sidney Island Brick Company, Pitt River Brick Company, and the Columbia Clay Company. In addition, there are several good-sized plants at points in the Mountains.

Pitt Lake Brick and Cement Company.

The plant of the above company is located 28 miles northwest of the city of New Westminster, and is owned by Mr. E. J. Fader, a prominent business man of that city. Pressed brick is produced, the output being about 20,000 a day. Mr. Fader has been in England for some months, and has just succeeded in bonding his brick property for a large sum. This will doubtless lead to an enlargement of the plant and the investment of considerable new capital.

Fraser River Brick and Tile Company.

This plant is situated in Ladner municipality, on the south side of the Fraser river, and is owned by Hemphill Bros., the well-known Vancouver contractors. The daily capacity is 40,000 common brick, but the actual output does not average more than one-half that quantity. A six-tunnel steam dryer is used. The firm require the six or seven million brick turned out for their Vancouver building operations, and in addition they have to import some three or four millions of pressed brick annually from Seattle. Messrs. Hemphill contemplate putting in a soft mud plant during the winter, increasing the capacity by 30,000 per day. The plant is opearted with steam power.

"One of the Finest Plants in the Dominion."

This was the verdict of a well-known Vancouver brick expert, following a visit of inspection to the new pressed brick works of the Anvil Island Brick Company, Limited, which is situated on Anvil Island, Howe Sound, about 22 miles northwest of Vancouver. The plant, which is just approaching completion, will be turning out by the first of the year, red pressed brick of unrivalled quality and color, judging from samples shown. The capacity of the works will be 30,000 daily, there being six repress machines, with grinding pans, etc., from England, and three improved down-draft kilns of large size.

Construction work on the plant was commenced about twelve months ago, since which time a large staff has been constantly employed. In addition to the plant proper, a large boarding house, a residence for the manager, and several cottages for married employees, have been erected. Between 80,000 and 100,000 yards of excavating had to be done.

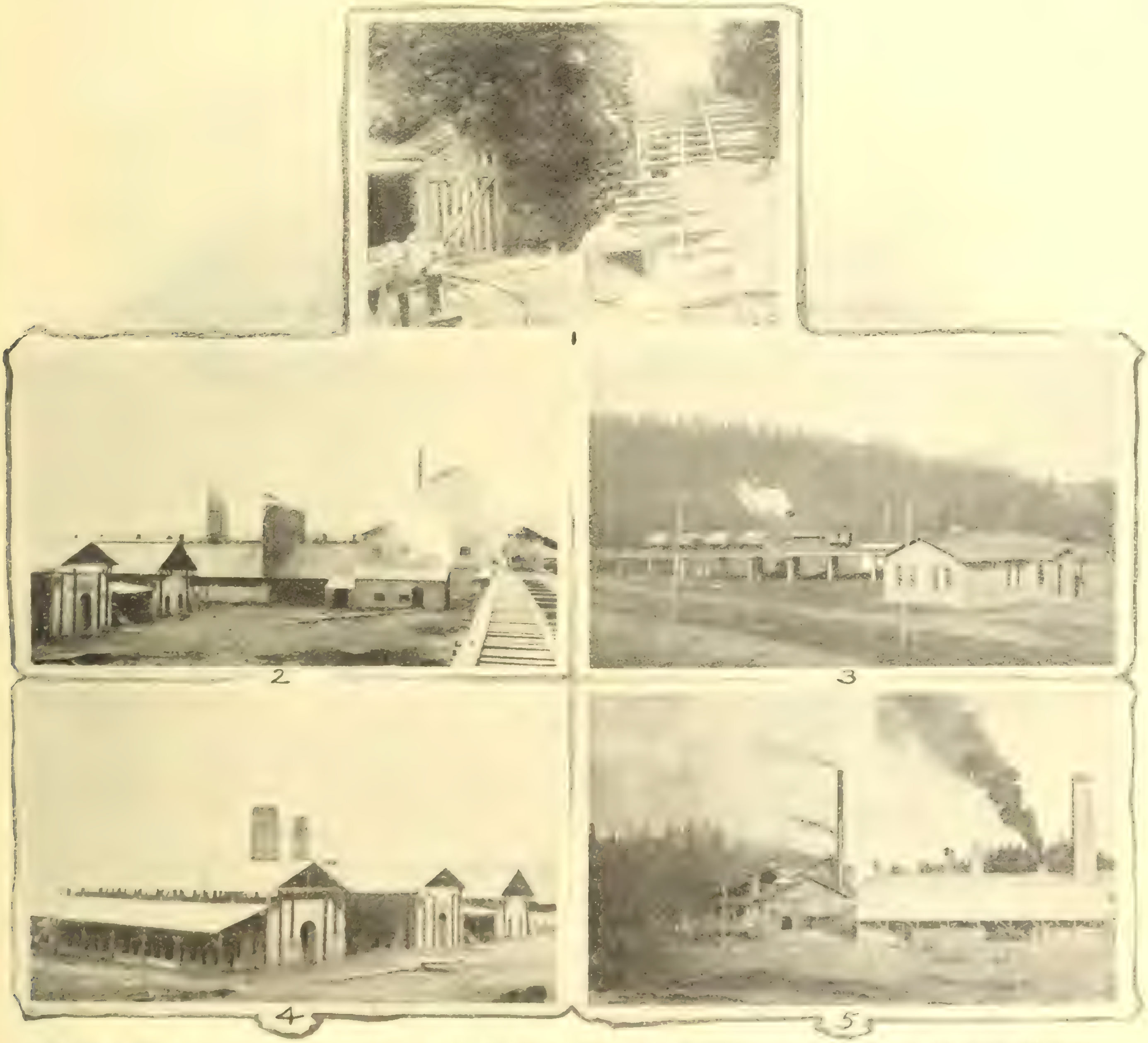
English capital is interested in the enterprise, which is regarded as being one of the most promising brick propositions in the Dominion of Canada. The president of the company is Mr. Frederick Lance, a gentleman of large experience in the brick business; while the manager, Mr. M. B. Taylor, who acted as engineer and superintendent of works during construction, has embodied in the new plant all the improvements suggested by a lifetime of practical association with brick industries in the old country.

British Columbia's Largest Pressed Brick Plant

Some eight or ten years ago fire clay deposits of large extent were discovered in the New Westminster district at a point about two miles west of the town of Abbotsford, on the C. P. R., and about 40 miles east of Vancouver. With the enterprise and energy for which British Columbia people are noted, the ''find'' was not long allowed to remain undeveloped, the growing demand for brick supplying the needed spur to action. The Vancouver Fire Clay Company was organized with a considerable capital, the shareholders including prominent local men and some Eastern capitalists who happened to be looking for an opportunity for investment in that line. Eight hundred acres of land were acquired and in due time a large plant was erected about a mile north of the railway track, the various buildings, kilns, drying sheds and dwellings for employees forming a little village to which was given the appropriate name, ''Clayburn.'' The initial investment was a large one, and the troubles which mark the early history of most brick plants soon cropped up. Bricks of excellent quality were turned out, but breakdowns were frequent; the daily output fell far short of the capacity of the plant, and dividends appeared to have no connection with the industry.

Under such circumstances it is little cause for wonder that when these conditions appeared to have become chronic, some of the stockholders evinced a disposition to withdraw. Eventually they did so and a little over a year ago the plant was taken over by the Clayburn Brick Company, comprising members of the original company who continued to have faith in the enterprise, and several newcomers, among whom were Mr. Roger Miller, of Toronto, and Mr. C. C. L. Wilson, of Ingersoll, Ont., each of these gentlemen becoming directors of the new company. The new owners were determined to profit by the mistakes of their predecessors, and their first efforts were directed to securing a competent expert to assume the management of the plant. They were fortunate in obtaining Mr. J. B. Millar, for eighteen years superintendent of the Don Valley plant, and known elsewhere as a successful manager and first-class brick and tile expert. Mr. Millar reached Clayburn in June of last year. After inspecting the plant and clay deposits, and carefully investigating the possibilities, he manifested his faith in the future of the enterprise by purchasing a large block of the stock of the company.

Then followed an era of progress, the improvements being effected gradually so as not to interfere with the operaion of



Clayburn Brick Company's Extensive Plant: (1) Entrance to One of the Company's Mines; (2) View of Works from North; (3) Office and Transportation Facilities; (4) View of Kilns; (5) View of Plant from South Side.

the plant. In the course of a few months the daily output was raised from 12,000 to 25,000 bricks, simply by readjusting the machinery and adopting better methods in connection with the handling of the raw material. Last winter two new kilns were erected, and there are now three large dry-pans in use, one of which—built by the Berg Manufacturing Company, of Toronto—was installed this season. Other additions to the plant comprised a granulator of large size for the manufacture of common brick, which was supplied by A. E. Doig & Company, of Toronto, as well as new conveyors and rolls for pulverizing, built by the Vancouver Engineering Works, which firm also furnished a number of dump cars of five-yards capacity each, for handling the clay material. As a result of these and other changes completed in June last, the output was further increased to 50,000 bricks in ten hours. Even this does not content the energetic manager, who hopes to reach the 75,000 mark in the near future. At present the machinery is driven by a new Wheeland engine, steam being furnishd by a 150 h.p. boiler. Mr. Millar had planned early in the season to instal electricity, and had purchased motors to generate 500 h.p., but at the last minute the Vancouver Power Company decided that it could not spare that amount of energy until the completion of the new development plant at Lake Coquitlam, which will be some time next season.

Present and Future Facilities.

There are three large rectangular kilns, each of 200,000 capacity, and six circular down-draft kilns of 50,000 to 80,000 capacity. The common brick are burned, for the present, in ordinary scove kilns, which are built as required. During the winter the company will add to their facilities by erecting a large continuous kiln for burning fire brick and common brick. The company also contemplate establishing, in the near future, a sewer pipe plant for making pipe from four to twenty-four inches in diameter. This project is due to numerous requests from contractors and others, who realize that the superior grades of clay available should produce excellent pipe.

A Well-Equipped Private Railway.

To ensure the economical handling of the raw material required to keep the big plant in operation, a narrow-guage steam railway line, three miles in length, had to be constructed to tap the various deposits. The rolling stock comprises two locomotives, and a number of self-dumping cars. The common clay is secured at a point only about a quarter of a mile distant from the works, a steam shovel dumping the material into the cars on the track alongside. Clay used in making the various grades of facing brick is found about two miles away. It is mined similarly to coal, being taken out in small mine cars to an overhead platform and dumped into the larger cars on the track beneath. The shale and fire-clay used in the making of fire brick and paving brick, is found about a mile further on; it is also secured by mining methods, being dumped into large bunkers erected alongside the track, from which it is taken as required. At the plant, the locomotive hauls the loaded cars up a trestle leading to capacious bunkers, into which the material passes to be fed into the several grinding machines as needed, by shovellers stationed below. A combined narrow-guage and standard spur line extends from the plant to the C. P. R. and B. C. E. R. tram tracks, about a mile distant, over which loaded cars for shipment and return empties are moved expeditiously by the company's locomotives.

Mr. J. S. Castleman,
President Clayburn Brick Company

Mr. J. B. Millar,
Manager Clayburn Brick Company's Plant

Nature Has Solved the Fuel Question.

As all brick manufacturers fully appreciate, the fuel question stands for one of the big items of expenditure in the operation of plants. Here in the West, where hardwoods are lacking, enormous quantities of the lighter woods are required for the firing of the kilns. For this reason the directors were enthusiastic when a seam of coal of excellent steaming quality was uncovered some time ago by the miners engaged in blasting the fire clay formation. No attempt has been made to open up the seam, but a sufficient quantity is being taken out daily with the clay to supply the power plants at both mines. As fire clay always occurs in juxtaposition with coal, and as there is a mountain of the material to work upon, there is reason to believe that, when the seam is properly developed, later on another large source of revenue will accrue to the company.

The officers of the company are: S. J. Castleman, president; W. H. Armstrong, vice-president; J. J. Plommer, secretary-treasurer; J. B. Millar, manager. Evans, Coleman & Evans, Limited, Vancouver, are the general sales agents. The head office of the company is located in the Imperial Building, Seymour street, Vancouver.

At Brockville, Ont., last week the death occurred of Robt. G. Harvey, at one time a well known railway contractor and promoter. The deceased was in his 70th year.

The Moose Jaw Pressed Brick Company, Limited, Moose Jaw, Sask., have installed a sand lime brick plant, with a capacity of 22,000 per day, and will commence operations next February. Mr. F. H. Strong, the president of the company is very optimistic over the prospects. When in Toronto recently he told the "Contract Record" that he had sold all the next year's output of his plant.

American Sewer Pipe Co.

General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed

Sewer Pipe

IN THE WORLD
FOR QUALITY

We Simply Invite COMPARISON

Standard and Double Strength

Sizes, 3", 4", 5", 6", 8", 9", 10", 12", 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office:

201 Devonshire St., Boston, Mass.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Tenders

For Roofing and Sheet Metal Work
in all parts of Canada

Communicate with

A Schwoerer & Sons, Inc.
530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

---

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co.
Campbellford, Ont. Limited

Bridge over Spanish River at Massey, Ont

Steel Bridges, Steel Buildings
Roof Trusses
and other Structural Steel

Foundry and Machine Shop in connection.
Estimates on application

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Modern Sewer Pipe Plant at New Glasgow, N. S., operated by the Standard Drain Pipe Company

Standard Drain Pipe Company

The Standard Drain Pipe Company, of St. Johns, P.Q., Limited, was established under Dominion charter in 1884. The company own and operate two sewer pipe factories, one at St. Johns, Que., and one at New Glasgow, N.S., and a fire clay factory at St. Johns, where they manufacture stove linings and all kinds of fire clay goods. At New Glasgow, N.S., the company own an up-to-date plant and an excellent property with 40 acres of clay, and shale 60 feet deep over the whole area. The St. Johns' factory, which was rebuilt in 1907, is located on an excellent property of 50 acres, underlaid with 30 feet of clay over the whole area. The company is operating 18 kilns of 33 feet and 37 feet inside diameter. The capacity of the plants, which is taxed to the utmost, is over 2,000 carloads per annum.

The goods manufactured by the company include salt glazed vitrified sewer pipe and connections, culvert pipe, wall copying, chimney tops, vases, chimney linings, and all kinds of fire clay and vitrified goods. The head office of the company is at St. Johns, P.Q. The officers are as follows: president and general manager, W. C. Trotter (Assoc. Mem. Can. C. E.); vice-president, G. H. Balfour (general manager, Union Bank of Canada); secretary-treasurer, H. G. Perchard.

The First in the Field

The Hamilton & Toronto Sewer Pipe Company, Limited, of Hamilton and Toronto, is said to be the oldest sewer pipe company in America, it having been established in 1860. The factory is located on Wentworth street, North Hamilton, Ont., and the head office is also in that city. There are branch office at Toronto, Ont. Mr. J. H. New is the president of the company and Mr. R. H. New, vice-president. Being centrally located the company are in a position to give prompt shipment to their large list of customers throughout Ontario. They also have an extensive business in the other provinces of the Dominion. The corporation of the City of Winnipeg recently ordered upwards of one hundred cars from the firm. They manufacture the famous "Hamilton Salt Glazed Vitrified Sewer and Culvert Pipe" in various thickness and sizes; also all lines of sewer pipe fittings, chimney tops, flue linings, wall coping and other articles well known to buyers of clay products. During 1909 their output was about one thousand carloads. During 1910 they have had a considerable increase over last year's business, and 1911 is expected to be an all round record-breaker.

The Largest Paving Brick Industry in the World

A concern which lays claim to be the largest producer of paving brick in the world is the Metropolitan Paving Brick Company, of Canton, Ohio. The output, according to Government statistics, is 125,000,000 paving brick and block annually—more than one-eighth of the entire production in America. Six enormous plants are operated by the company.

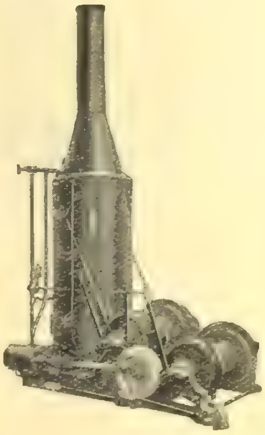
One of the features of Metropolitan Paving Brick is its uniformity. Carload after carload is sent out year after year without there being the slightest change of character in the material. And the company can maintain their production at the same rate for generations, the supply of shale being practically inexhaustible.

Selected Metropolitan block in different shades of colors is now being used extensively for building purposes. During the last few years architects have begun to realize the possibilities of this block and it is now becoming an important feature of the company's business.

The officers of the company are: C. W. Keplinger, president; W. E. Keplinger, vice-president; J. J. Sullivan, vice-president; H. S. Renkert, treasurer and general manager; H. G. Barbour, secretary; A. P. Maurer, manager of sales.

37-foot Kilns at the St. Johns Factory

St. Johns, Que., Factory of Standard Drain Pipe Company



Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

—The Philosopher of Metal Town.

Specify in the Contract

"Metallic"
Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

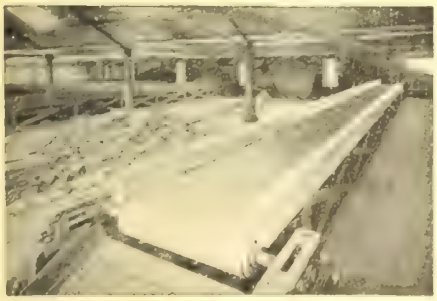
Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1952

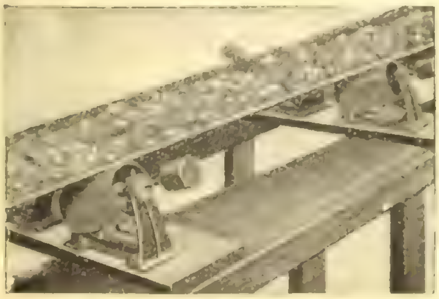
The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

for Transmission and Conveying



Troughed Conveyor



Flat Conveyor

For conveying **Clay, Brick, Coal, Ore** etc.
Equally good in **Wet** and **Dry** places.
This is a **solid** belt, and can be furnished in any thickness up to 9-16" and in widths up to 66".
Ask for Bulletins and Price lists.

Federal Engineering & Supplies Limited
284 Yonge Street, TORONTO

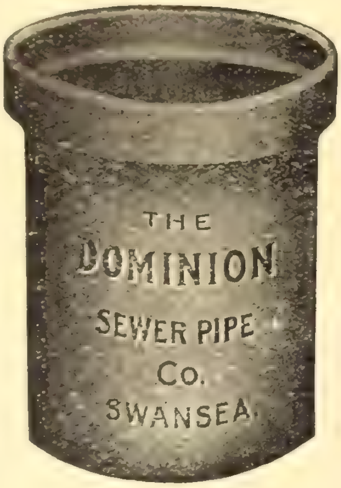
AGENTS: Power Economics Ltd., Montreal. McDougall Hardware Co., Ottawa
Marks-Clavet-Dobie Ltd., Pt. Arthur. Great West Saddlery Co., Calgary
Geo. Taylor Hardware Co., Cobalt.

Agents Wanted in Other Cities.

Dominion Sewer Pipe

Company, Limited

Swansea, - Ontario



Manufacturers of

Sewer Pipe

Wall Coping, Flue Linings,

Chimney Top Inverts . .

Our salt-glazed vitrified sewer pipes are true to size and impervious to water. Sizes 4 to 24 inches always carried in stock. We guarantee prompt service and satisfaction.

Get our quotations for your next contract

Dominion Sewer Pipe Company

Limited

Swansea, - Ontario

J. H. NEW, President

R. H. NEW, Vice-President

Do you know about the Sewer Pipe that are being made at Hamilton?

We are working overtime to keep up with the orders that are coming in from all over the Dominion. This immense business is coming to us for no other reason than that the contractors, engineers and consumers throughout Canada are convinced that

Hamilton Salt Glazed Vitrified Sewer Pipe

is without an equal. Then, too, our prompt delivery and careful loading have contributed their quota to this wonderful result. Just write us statting your requirements. We are positive we can prove our claims

Others Say So!

The Hamilton & Toronto Sewer Pipe Co.
Limited
Hamilton and Toronto

SEWER PIPE

Salt Glazed

Vitrified

Connections
Inverts
Stove Linings
Loco Blocks
Range Bricks
Wall Coping
Culvert Pipes
Flue Linings
Fire Bricks
Gulley Traps
Cupola Linings
Drain Pipe

All Kinds of Fire Clay Goods

We are the largest manufacturers of Stone and Range Bricks in Canada and make the best quality.

We also make "Special Shapes" any pattern and size required.

We invite correspondence with Stone manufacturers.

The
Standard Drain Pipe Co.
Limited
ST. JOHNS, QUEBEC

Consumers of Sewer Pipe
Fix your Eye on the Centre
of this page. We can't
always be with you,
but ask that you
bear in mind
that

Mimico Sewer Pipe

are
all that you
could desire in a
First Class Article.
The Aim of the Makers is
to do One Thing Well

The Ontario Sewer Pipe Co. Limited
MIMICO, ONT.

Telephones, Toronto Connection: Office Parkdale 422
Nights and Holidays
Mr Skelton Park 3889 Mr Dods Park 3888

The Deckman-Duty Brick Company

Cleveland, Ohio, U.S.A.

CAPACITY: 30,000,000 paving block annually.

Three Brands:

Medal, Collinwood, Deckman-Duty Block

QUALITY: " Not better than best, but better than the rest."

RECORD: Hundreds of cities succesfully and with complete satisfaction using our product during the past **twenty-five years.**

Inquiries and correspondence solicited

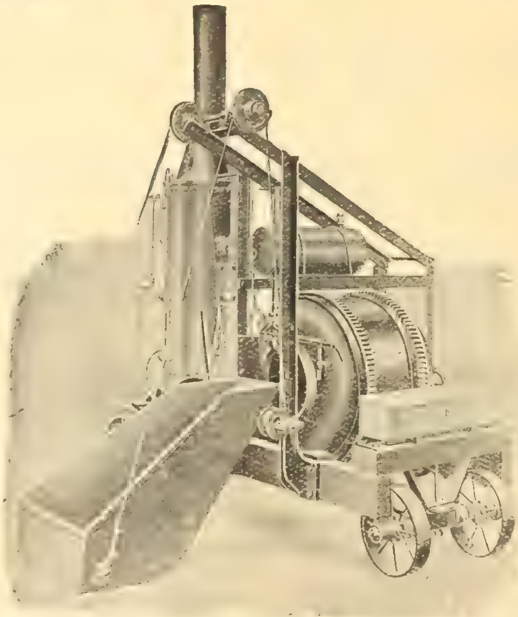
Koehring Concrete Mixers

Steam, Motor or
Gasoline Drive

Simple in Operation

Substantial in
Construction

Made in sizes to meet all requirements.



Koehring Mixers have proved their superiority by quick action — uniformity of mixture, and reliability under the most exacting conditions.

MANUFACTURED AND SOLD IN CANADA BY

CANADA FOUNDRY COMPANY, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Something about Brick Dry Kilns

The "Van Duzer Exhaust and Live Steam Condenser System Dryer" will save you TIME, TROUBLE and MONEY

End view of Fuel and Air Furnace.

We have been years gaining the knowledge that assures our success. We have never failed to dry brick perfectly. The more trouble a manufacturer has drying his clay products, the greater is our opportunity to give him perfect results with our "Rarefied Air Condenser System."

We will build a Dryer any size, any time, anywhere, and at a price to suit your plant. Some of the advantages of our system are :—

No change in your machinery required.

No change in your Car or Truck system.

If you have boiler power to run your machinery successfully, it will be alright to run the dryer also. We build dryers utilizing all the exhaust steam when you are manufacturing your brick, and live steam at all other times. If you are not using steam power, we can build for you our "Rarefied Air Furnace Dryer," adapted for using any kind of fuel, wood, coal or oil, and **Guarantee** to dry your products in 12 to 14 hours at less cost than any other system "On Earth."

BRICK DRYER.—The furnace extends across the end of the dryer, and is connected to the air conduits and pipes, which are inside of the air conduits. The air passes around the furnace into large air conduits which carry the rarefied air through the drying room. This air passes out through the openings in the conduits and then through the bricks, moving towards the ends of the rooms. The perfect circulation of the rarefied air is a superior advantage in drying clay products. Bricks have been dried perfectly, in 12 hours, at a cost not exceeding 11c. per 1000—for labor and fuel.

Extracts from letters by satisfied owners:

> "We are making a better brick than in the 27 years' time we have been in the business. Have no bats, where without the Dryer we lost at least 20 per cent of the output in bats. The fact is I would not do business without your Dryer."
>
> "It was just 16 days from the morning I put the first clay in the machines until the first lot of brick was delivered from the kiln. Not a small wheelbarrow of bats.

Correspondence Solicited

CLAY DRY KILN COMPANY

Room 41 Mezerott Building, Washington, D.C.

What's in a Name BERG

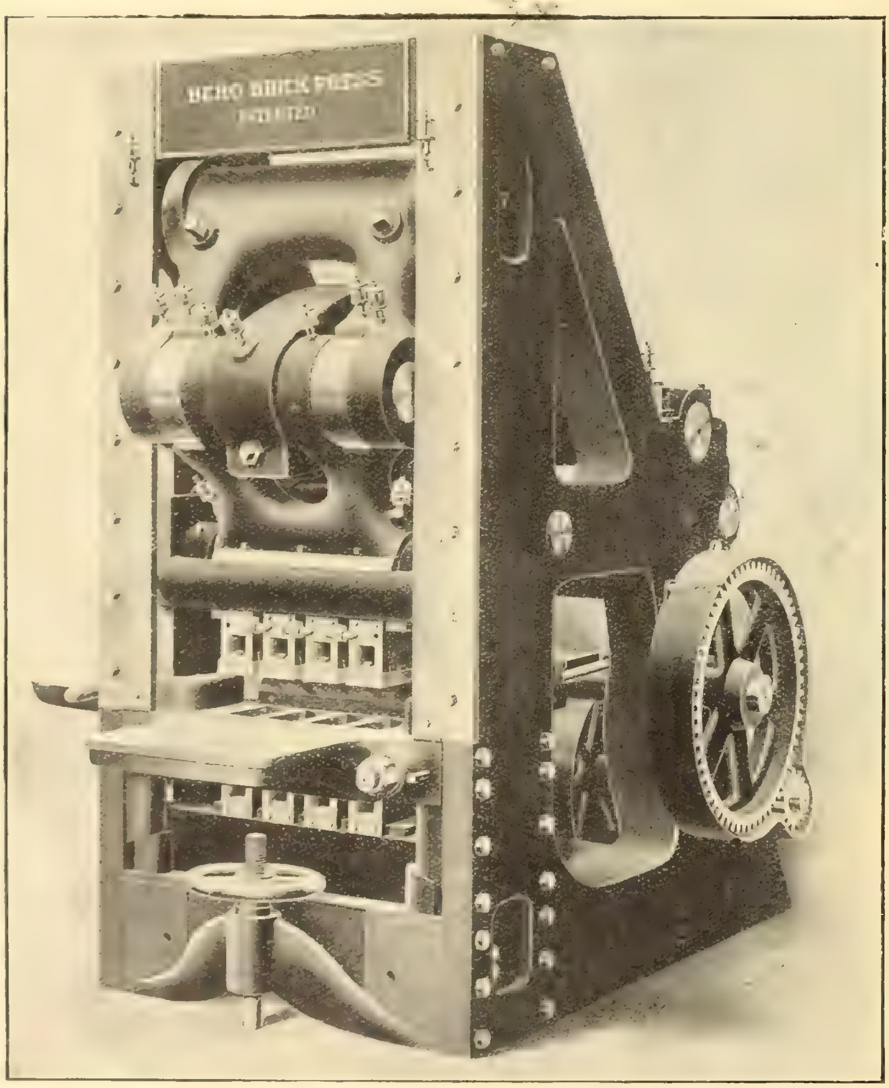
B: SIMPLICITY STRENGTH DURABILITY

E: ACCESS TO ALL PARTS

R: GREATEST PRESSURE

G: BEST PRODUCT

The "Berg Press" is the Highest Development in the Art of Brickmaking Machinery, so Pronounced by the U. S. Government



IMPROVED BERG BRICK PRESS

The Berg Press Excels
for
Shale Pressed Brick
Clay Pressed Brick
Sand-Lime Pressed Brick
Sand-Cement Pressed Brick
Fire Brick

The Berg Press
Gives Three Distinct Pressures
Result is:
No Granulated Centers

The Berg Press
Has All Working Parts Above
Clay Line

The Berg Press
is fitted with "The Berg Patented Mold Box"—The Delight of Brickmakers, and which many others have tried to imitate.

All Sizes and Shapes
Can be Made
Molds Can be Changed in a Few
Minutes
Owing to the
Simple Mechanical
Construction

Cut Gearing, and many other steps forward in improvements, and built of the Highest Grade of Material and Workmanship. Fully Guaranteed as to its success.

Manufactured by its inventor in Toronto, Canada, exclusively. Also all equipments for Pressed Brick Plants to make Sand-Lime Brick, Sand-Cement Brick, Shale Brick, Clay Brick and Fire Brick.

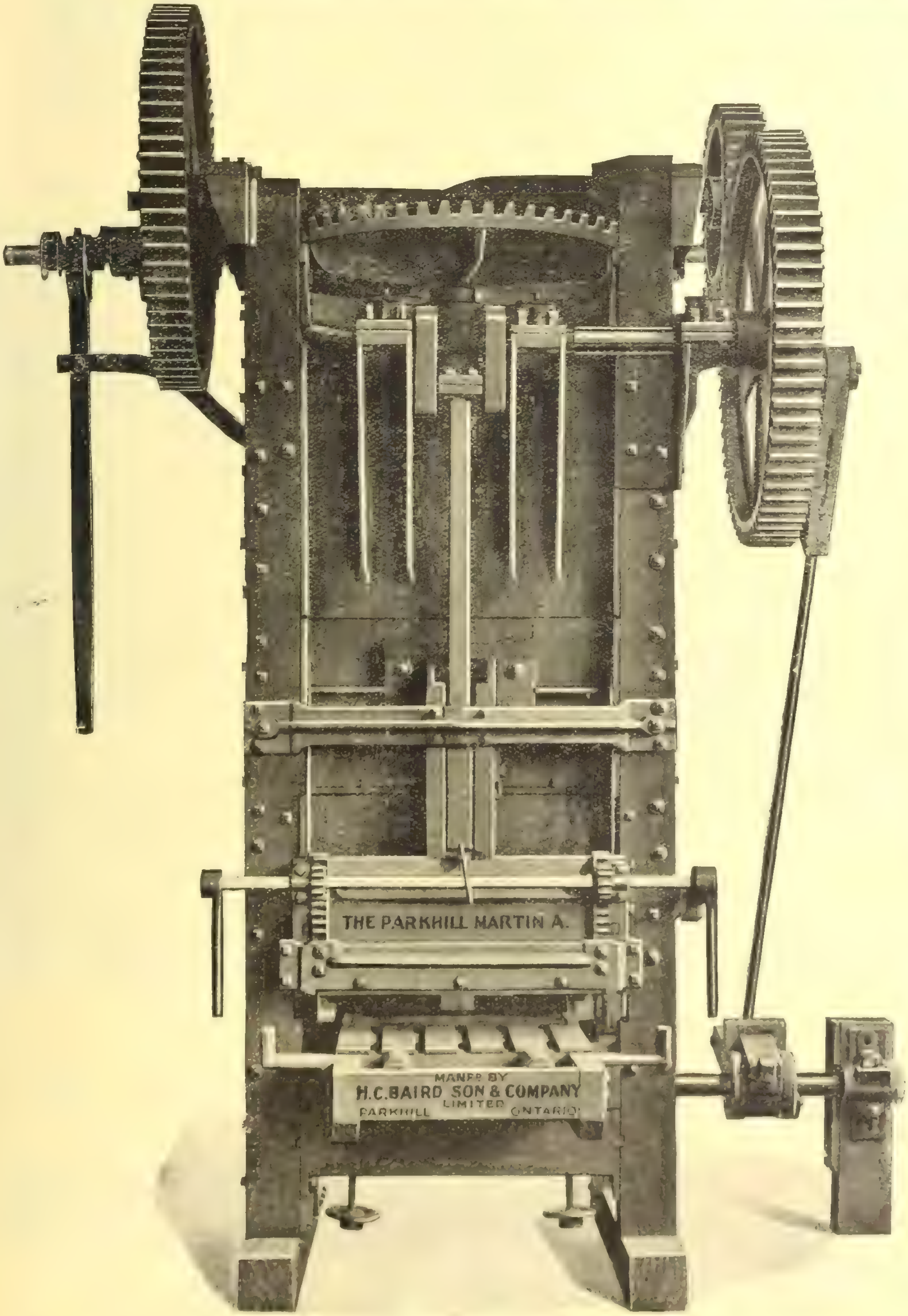
Correspondence Solicited-

The BERG MACHINERY MANUFACTURING CO., Limited

Office and Works: Bathurst and Niagara Sts., Toronto Canada.

The New Parkhill–Martin A

The Machine that gives the largest capacity at the smallest cost



Everything for the Clay-worker

Brick Machines

Mould Sanders

Pug Mills

Friction Clutch Pulleys

Tile Machines

Crushers

End Cut-off Brick Tables

Tile Cut-off Tables

Kiln Doors Plates and Bands

Grate Bars

Turn Tables

Sand Machines or Pounders

Friction Hoists

Kiln Platform and Dump Barrows

Trucks, Transfer Cars and Dump Cars

Sand Dryers

etc., etc.

H. C. Baird, Son & Co., Limited

PARKHILL,
ONTARIO

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

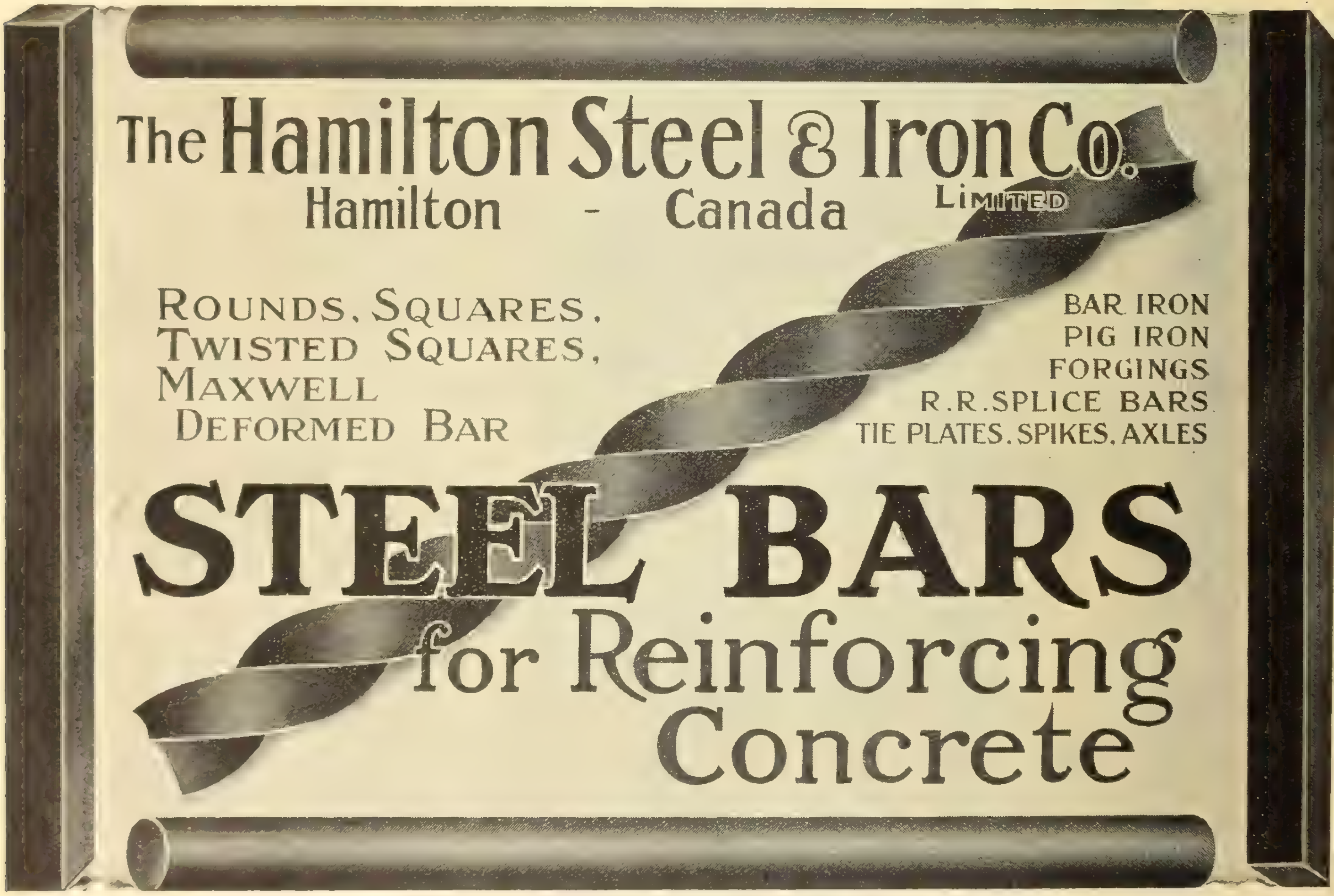
CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.



The Hamilton Steel & Iron Co. Limited
Hamilton - Canada

Rounds, Squares,
Twisted Squares,
Maxwell
Deformed Bar

Bar Iron
Pig Iron
Forgings
R.R. Splice Bars
Tie Plates, Spikes, Axles

STEEL BARS
for Reinforcing
Concrete

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE CARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

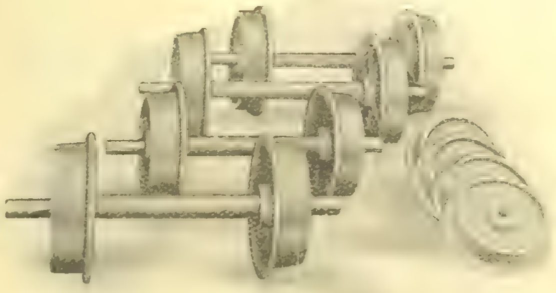
Manufacturers

Flexible and Flange Pipe,
Special Castings and all kinds of
Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que.
Hamilton, Ont.
Three Rivers, Que.
Midland, Ont.
Londonderry, N.S.
St. Thomas, Ont.
Fort William, Ont.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 685—686

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridges' Bay, TORONTO

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

45 inch and 42 inch Pipe for Brantford, Ontario

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

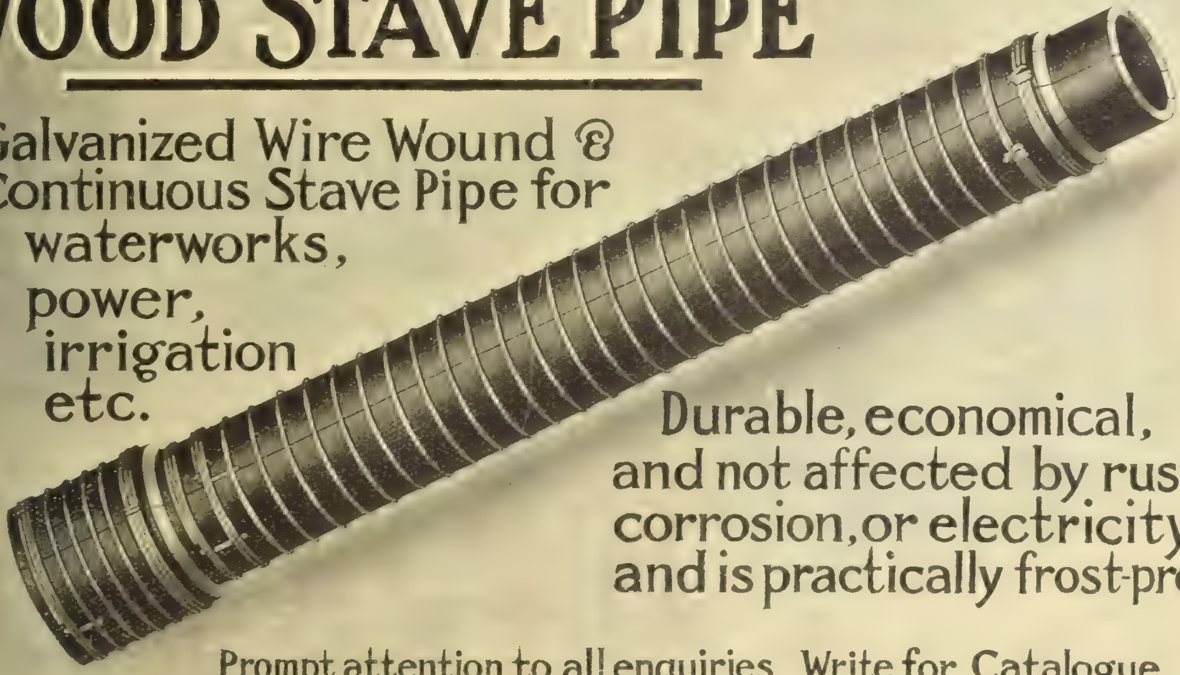
Write for Illustrated Catalog

WINNIPEG, MAN.—F. H. McGavin Co., Ltd.
SEATTLE, WASH.—Pacific Lock Joint Pipe Co.
LOUISVILLE, KY.—Harris Engineering Co.

MONTREAL, QUE.—Francis Hankin
CHATTANOOGA, TENN.—Howard Egleston
HAVANA, CUBA.—Huston Concrete Co.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



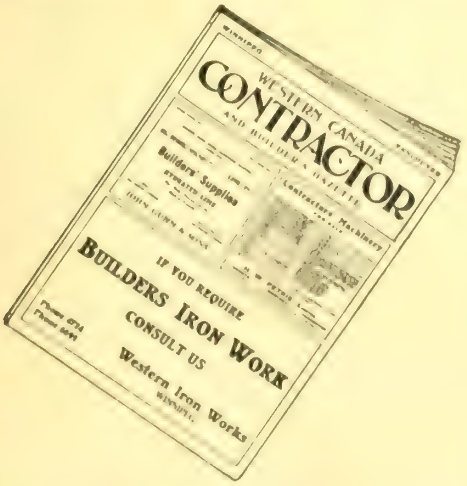
Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.



WESTERN CANADA CONTRACTOR AND BUILDERS' GAZETTE

Builders' Supplies

IF YOU REQUIRE BUILDERS IRON WORK CONSULT US

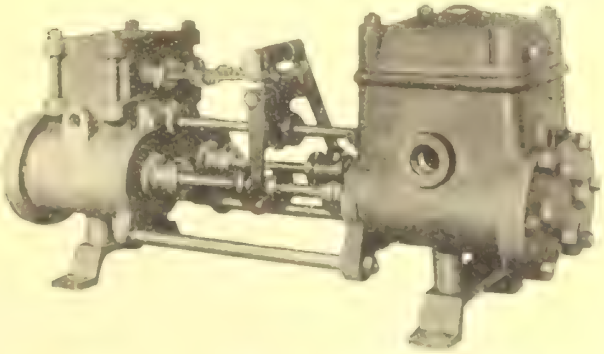
Western Iron Works

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery

Martin Pump & Machine Co. Limited
Toronto, Canada

Climax Hoisting Engine

for running two platform Material Elevators

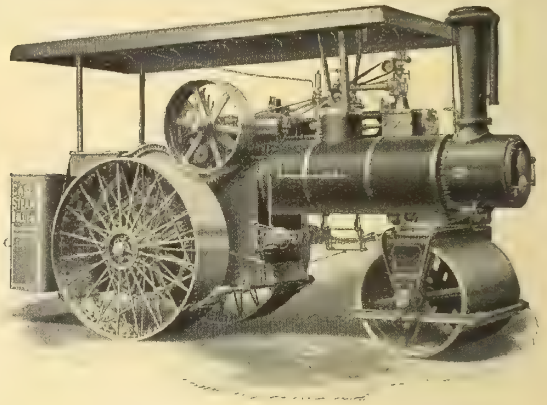
Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company

Hamilton, - - Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

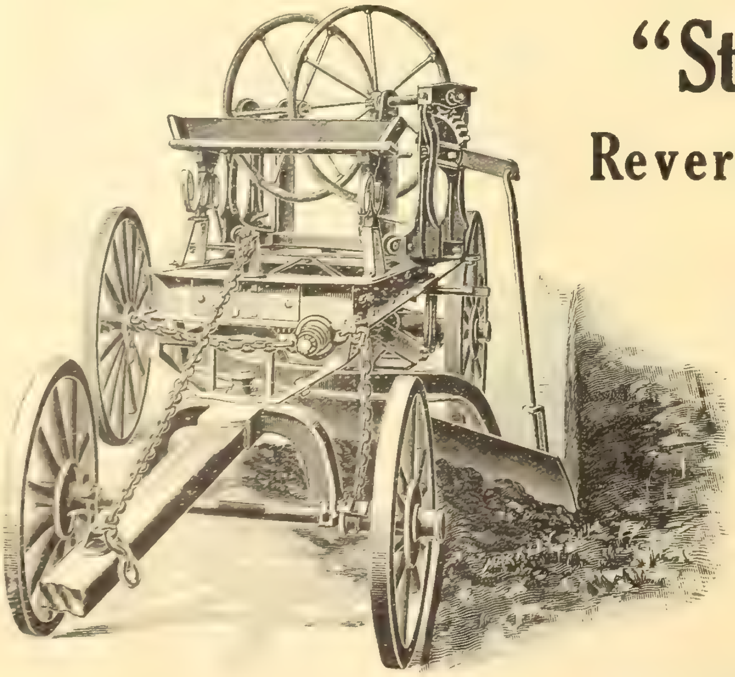
Racine, Wis., U. S. A. **(Incorporated)**

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY if you do your Road Making with a



"Steel Champion"

Reversible Road Machine

This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.

of Canada, Limited

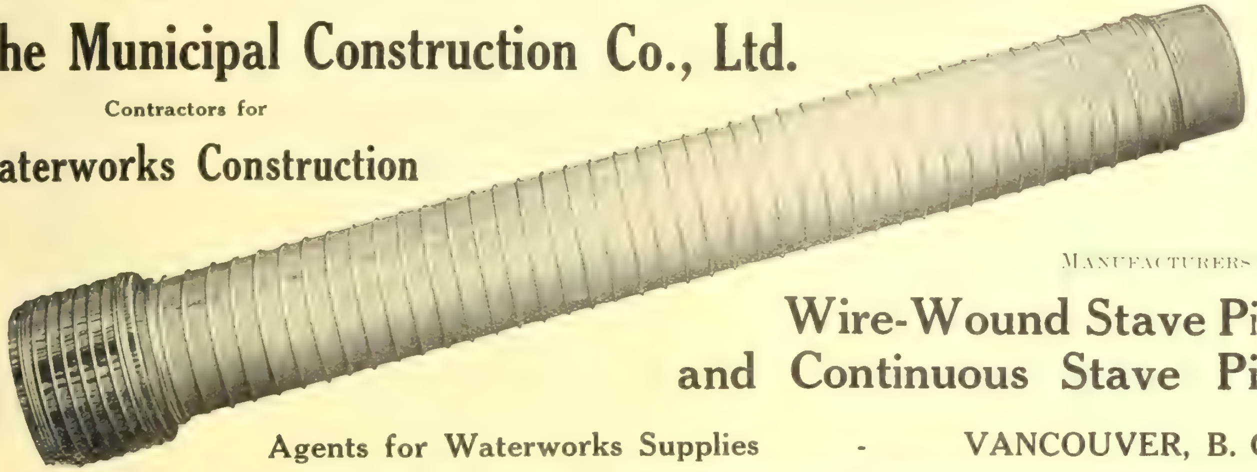
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction



MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

Everything for the Builder

Sand and Gravel Screened, Pit Run and Pea Gravel Building Sand

We can also ship promptly, Building and Crushed Stone, Lime, Cement, Fire Clay, Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile.

LET US FIGURE WITH YOU.

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North 2107

Chestnut House Trim

Our Specialty

also Pine and Hardwood

Our work gives satisfaction

The Tillson Co., Limited

Tillsonburg, Ont.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

The

Willson Portable Flare Light

Good contractors know that it always pays to get the best appliances.

The Willison Portable Flare Light, which is specially adapted for use in all kinds of construction work, cannot be beaten in efficiency or cost. Think of it, this light gives a candle power of 8,000 at a cost of less than six cents an hour.

International Marine & Signal Co.

Limited

OTTAWA - CANADA

Our Specialties

- Special Mantels
- Staircases
- Panelling
- Bank Fittings
- Office Fittings
- Glass Partitions
- High Class Doors
- House Fittings

Phone Main 3166 After Business Hours College 1097

Lickleys Limited

MAIL BUILDING

TORONTO

Estimates Given

We supply Contractors with high class Interior Fittings of all kinds.

Enquiries for Ontario and East should be addressed to
LICKLEYS Limited,
Mail Bldg., Toronto

For Winnipeg and District,
J. MALCOLM SUTTIE,
Travellers Bldg.
Winnipeg

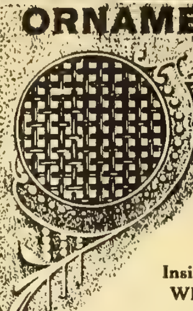
For British Columbia,
E. V. ALBURTY & CO.,
Dominion Trust
Bldg., Vancouver

The Original
MARSH-PAUL AIR VALVE
Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture — also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our
WINDOW GUARDS
Insist on having HARD STEEL WIRE
WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Mixed Cars

We make a specialty of mixed cars of builders' material.

SASH, DOORS (pine or veneered hardwood), **MOULDINGS, CEILINGS, FRAMES, EMPIRE BRAND HARDWOOD FLOORING, STAIRS,** etc.

These materials are strictly high grade and will give a FINISH to house that is sure to please even the most critical.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent:
The Hardwood Flooring Co., 55 St. Francois Xavier St.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

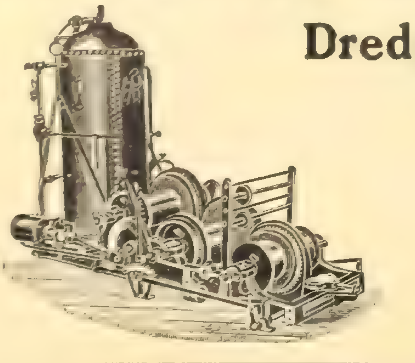
Prompt Deliveries   Write for prices

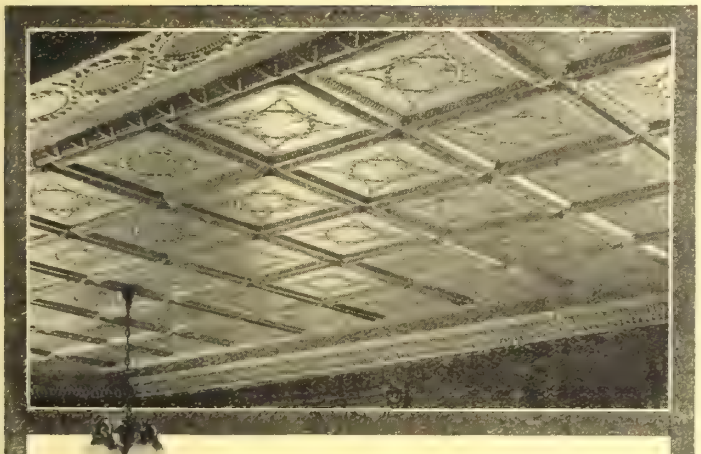
L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W.   Phone Main 5912   TORONTO
Planing Mills, East Toronto - Phone Beach, 230

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery





WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superioity** and faithfulness to art in styles they typify.

Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

One reason for Herringbone popularity

Because Herringbone is the Self Furring Lath!

The Herringbone ribs project outward.

They sustain the twisted filaments away from the wood backing

They also allow plaster to entirely surround the lath.

Every brand of metal lath used on wood studs should be self furring at the studs.

Other brands adopt special devices to secure self furring.

All Herringbone lath is **always** self furring.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

All International Varnish Products are Sold in full Imperial Measure Cans

That means more satisfaction and better goods for your customers at the same money. Their satisfaction means trade insurance—A permanent clientele for you.

Many prominent architects are kind enough to say that all International Products are hall-marked "Superior Quality."

Be that as it may, when you specify International Products your reputation is protected as far as the ingenuity and experience of any manufacturing concern can protect.

Secure our new album of Superior Finishes and judge for yourself.

Specify the following International Products in the contract:

Elastica Floor Finish

Satinette "The Enamel that stays white."

Kleartone Stains

Flattine Finishes

Full Imperial Measure is used in all Packages

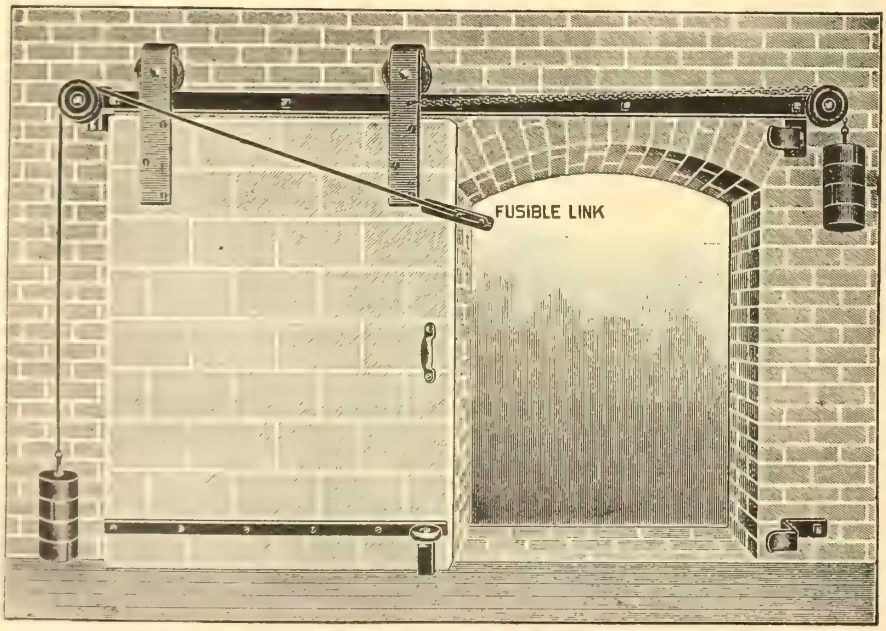
Made by

International Varnish Co., Limited

TORONTO WINNIPEG

2768

Level Slide Fire Door



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

DB

DOUGLAS BROS LIMITED

TORONTO, ONT. MONTREAL, P.Q.

DB

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper, but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PILE DRIVING

LAND OR WATER

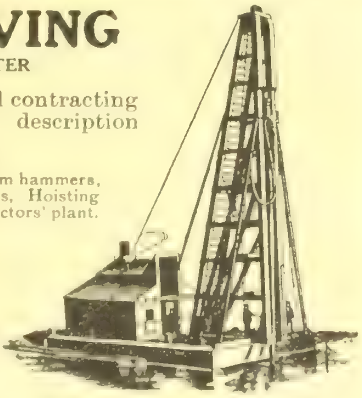
Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.



Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engin

Established 1882

THE COMMERCIAL

The WEEKLY FINANCIAL, COMMERCIAL & GENERAL TRADE NEWSPAPER of the GREAT WEST,

Winnipeg Manitoba

The Calkins Tile & Mosaic Co., Limited

Wall Tiles, Hexagon Floor Tiles, Quarries, Ceramic Mosaic, Marble Mosaic

Interior Marble, Slate and Granite Work

The
Smith Marble & Construction Company, Limited
458 Bleury Street, Montreal

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

DOMINION BRIDGE CO.

LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges and Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

——Bridge and Construction Dep't.——

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y. -	71 Broadway
Baltimore, Md. - -	Continental Trust Bldg.
Boston, Mass. - - -	70 Kilby Street
Chicago, Ill. - - -	Western Union Building
Mexico City, Mex. -	Edificio de "La Mutua"
Philadelphia, Pa. - -	Morris Building
San Francisco, Cal. - -	1505 Chronicle Building
St. Louis, Mo. - -	Commonwealth Trust Building
London, England - -	110 Cannon Street
Steelton, Penna. - -	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
Limited

Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1040

Steel and Wood **TANKS**

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever together with the design and sturdy construction of the jack, makes it the speediest and easiest working lifting apparatus on the market. Made in plain and [illegible] styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 30 tons capacity. Now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company Montreal

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

JAMES TAYLOR

Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red Stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch -square, 1-inch hex, and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.
High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions. 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.55.
Cement, car lots, f.o.b. Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $10.00.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, $1.05 per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

[illegible] & [illegible], contractors, Montreal, Que., are stated to have dissolved.

New Century Wall Plaster Co., Montreal, Que., are stated to have dissolved.

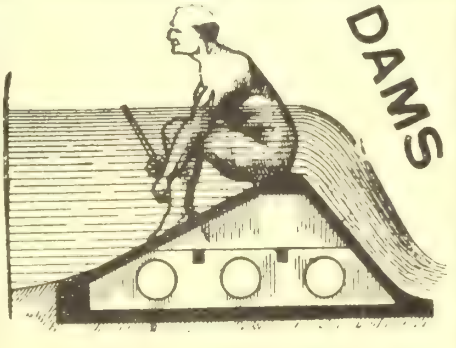
Huntsville Engine Works Co., Ltd., Huntsville, Ont., are stated to have assigned to [illegible] [illegible].

[illegible] & [illegible], sash and door manufacturers, Isle Verte, Que., are stated to be [illegible] to compromise.

Craig & Anderson, lumber and implement manufacturers, [illegible], [illegible], are stated to be [illegible] partnership.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock
Office and Works:
Phone M [illegible] [illegible] Esplanade, E. TORONTO

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P. Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The
Katie
Foundry,
Galt, Ont.

Municipal
Water Pipe,
Service B[illegible]es,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or
Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe rerequirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

MILL WORK

Sash, Doors, Frames, Stair and Veranda Material to Detail

S. Anglin & Company
Kingston, Ontario

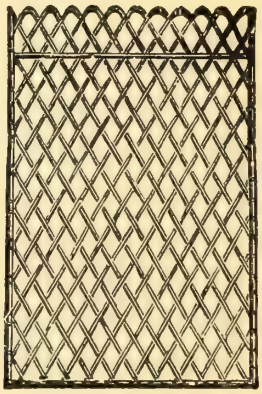
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequaled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

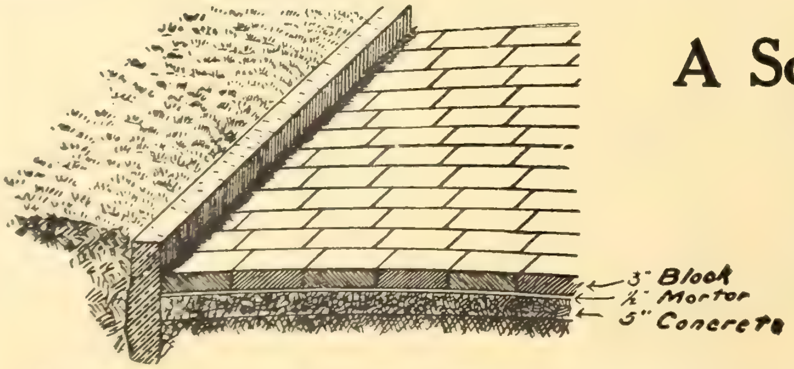
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co., Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

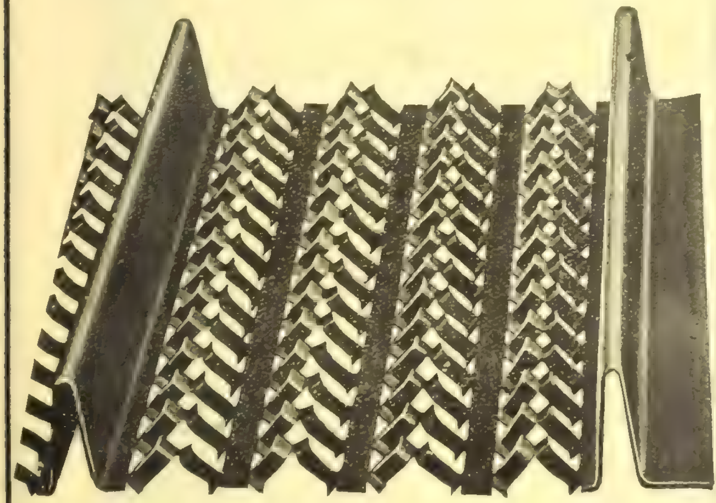
The Ontario Asphalt Block Company, Limited - Windsor, Ont.

KAHN SYSTEM

Products include

HY-RIB

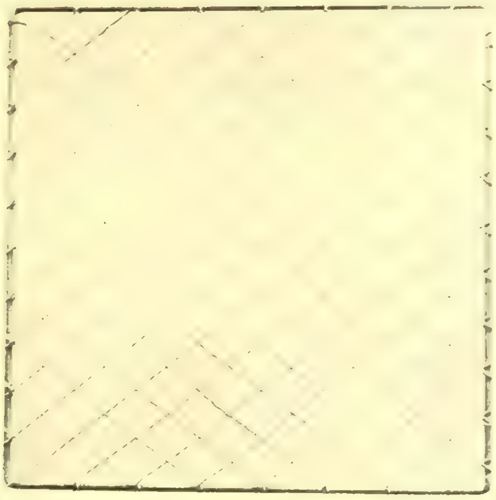
Combination of metal, lath and chourul in one sheet. Does away with expensive wiring, studding also Form work when used as reinforcement for floor or roof slab.



Trussed Concrete Steel Co.

of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.

Limited

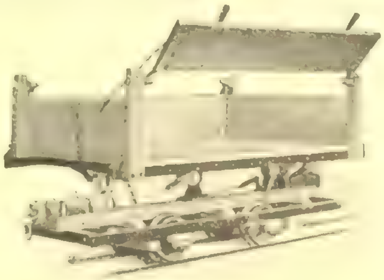
LONDON - - TORONTO

The

Meaford Wheelbarrow Co.

Limited

MEAFORD, ONTARIO



Manufacturers of Contractors' Supplies, etc.

WHEEL SCRAPERS—Pressed Bowl and Square Box.

DRAG SCRAPERS—Pressed Steel, Handles on top or sides, with or without runners.

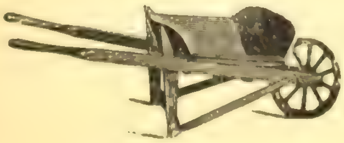
DUMP CARS—**GRADING PLOUGHS.**

STERLING line of Roller Bearing, Easy Pushing Wheelbarrows and Concrete Carts.

WHEELBARROWS of every description, both in steel and wood.

TIMBER DOLLIES, TRUCKS of all kinds.

ASK FOR OUR CATALOGUE



SELLING AGENTS.

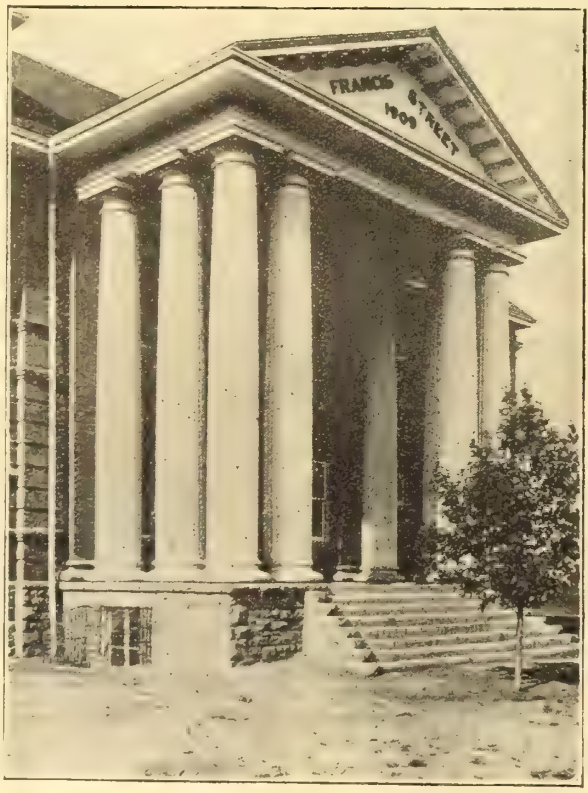
Alexander Gibb, 13 St. John Street, Montreal.
Bissett & Loucks, Ltd., 151 Notre Ave. E. Winnipeg, Man
John Burns, 313 Water Street, Vancouver.

Column Style B. L. No. 2

BATTS

Limited

The place to buy Staved Columns, Pine and Veneered Doors, Sash, Newel Posts, Trim and Cypress Greenhouse material.



Francis Street Public School, Fort William

The above Fluted Columns, which are 36 inches in dia- at base of shaft and 26 feet long were manufactured by us.

Our column department, which contains 10,000 square feet of floor space, is equipped throughout with special machinery mostly of our own design. We have appliances to make plain or fluted columns up to 48 inches in diameter and 40 feet long.

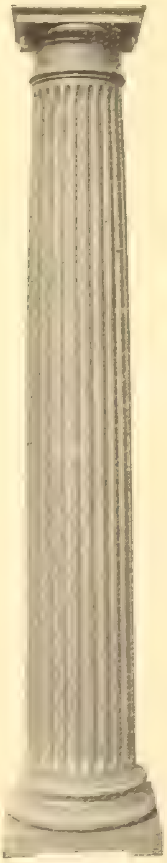
Send for Illustrated catalogue

Batts Limited

374 Pacific Ave. - West Toronto

Door Style No. B L. 310

Door No. B.L. 312



Column Style B.L. No. 3

The Jacobs Building, Montreal

Fire-Proof Throughout

Furred Exclusively With | **Lathed Exclusively With**

PEDLAR

FURRINGS | **LATH**

Architects: MITCHELL & CRIGHTON
Contractors for Lathing: D. G. LOOMIS & SONS, and CHURCH ROSS & CO.

Thousands of yards of **Pedlar Galvanized Lath** used.

The PEDLAR PEOPLE of Oshawa

ESTABLISHED 1861

HALIFAX 16 Prince St
LONDON 86 King St
WINNIPEG 76 Lombard St
MONTREAL [illegible] Craig St. W
PORT ARTHUR 45 Cumberland St
OTTAWA [illegible] Sussex St
TORONTO [illegible]
CHATHAM 200 King St. W
QUEBEC 127 Rue du Pont
REGINA 1901 Railway St. S
CALGARY Room 7 Crown Block
VICTORIA 434 Kingston St
ST. JOHN, N.B. [illegible] Prince William St
VANCOUVER [illegible] Pender St
EDMONTON [illegible] North of Jasper

Address Our Nearest Warehouse We Want Agents In Some Sections Write For Details Mention This Paper

Barrett Specification Roofs

Longest Wear for Lowest Cost

THE cost **per year of service** is the only true test of a roofing.

It discloses the absolute superiority of Barrett Specification Roofs. That is why on large manufacturing plants where costs are carefully computed, such roofs are almost invariably used.

Barrett Specification Roofs are inexpensive, costing much less than tin for instance, and little more than the best grade of ready roofings.

And their cost of maintenance is nothing, for they require no painting; they can't rust, and they will give satisfactory protection for 20 years or more.

Insurance underwriters classify these roofs as "slow burning" construction acceptable on "fire-proof" buildings.

Barrett Specification Roofs are immune from damage by acid fumes.

They are used extensively on railroad round houses. On cotton mills with their humid interiors, these Roofs give perfect satisfaction for dampness does not affect them from below.

The Barrett Specification Roof illustrated above is 50,000 square feet in area and covers the Round House of the Vandalia Lines.

We will be glad to supply a copy of The Barrett Specification on request to anyone interested in the subject. Address nearest office

The Paterson Manufacturing Co., Ltd.

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?

Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists **London, Canada**

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, its officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

1200-1210 Morton Bldg. - CHICAGO, ILL.

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting
your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

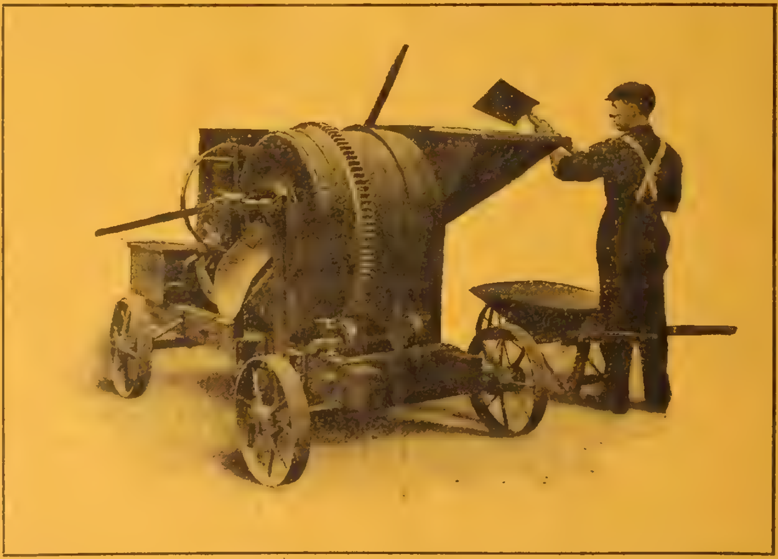
Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

"The Ransome"

Everybody who builds concrete walls, concrete walks or curbs, concrete anything, can have the best concrete that can be made at the least possible cost, because our new No. 4 Ransome, in efficiency, is the equal of our larger machines, and it is sold at a price which makes it an easy and a wise purchase for anybody.

The No. 4 Ransome is a truly marvelous little machine. It is an exact reproduction on a small scale, of the ransome that made the correct mixing of concrete cheap—it's the same wonderful mixer in miniature. This is the first really modern, effective, and economical small mixer ever put on the market.



No. 4 Ransome Equipment

This machine is equipped with Gasolene Tank, Ignition Batteries, Cooling Tank, Improved Steel Squaring Plates and all necessary Engine and Mixer fittings—an absolutely complete outfit, ready for perfect operation.

Mixer, with engine, Charging Hopper on Trucks complete, weighs 1750 lbs.

F.H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **Ritchie Contractors Supply Co., Vancouver**

ol. 24 Toronto, December 14, 1910 No. 50

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

STEAM AND POWER PUMPS

A-1 Ex.

PACKED PISTON PUMPS

For any service up to a water pressure of 150 pounds.

CENTRE OUTSIDE PACKED PLUNGER PUMPS WITH POT VALVES

Specially adapted for marine work.

AUTOMATIC FEED PUMPS AND RECEIVERS. COMPOUND DUPLEX PUMPS. INDEPENDENT JET CONDENSERS. CENTRIFUGAL PUMPS. OIL SEPARATORS.

All suitable for export. Write for Special Prices and Discounts.

HE SMART-TURNER MACHINE CO. LTD.
01 BARTON ST. EAST, HAMILTON, CANADA

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited

(HILL & RUTHERFORD, Managing Directors)

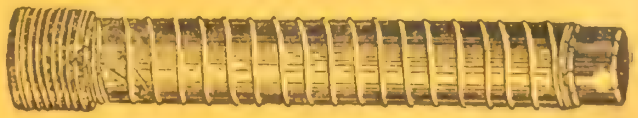
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

Rand Quality Machines

- AIR COMPRESSORS
- ROCK DRILLS
- HAND HAMMER DRILLS
- TEMPLE ELECTRIC-AIR ROCK DRILLS
- CALYX DIAMONDLESS CORE DRILLS
- SUBMARINE ROCK DRILLS
- SHEET PILE DRIVERS
- DRIFT BOLT DRIVERS
- IMPERIAL SAND or CONCRETE RAMMERS
- IMPERIAL RIVETTERS
- COMPRESSED AIR PUMPING SYSTEMS

Every machine here mentioned has back of it not only a record of success but the reputation of the largest pneumatic machinery manufacturers in Canada.

CANADIAN RAND CO., LIMITED
Commercial Union Building, MONTREAL, QUE.
Toronto, Cobalt, Winnipeg, Rossland, Vancouver, Halifax



Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company
Limited

MANUFACTURERS OF HIGH GRADE
PORTLAND CEMENT

Mills at
Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :
Montreal

Sales Offices :
Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work

	Page
Canada Wire Goods Mfg. Co	19
Dennis Wire & Iron Works	10

Air Compressors

Escher Wyss & Co	54

Belting

Federal Engineering & Supplies, Ltd	49

Boilers

Inglis, John	22
Jenckes Machine Co	2
Leonard & Sons, E	49
Marsh & Henthorn	49
McDougall Caledonian Iron Works	20
Mussens Limited	30
Taylor-Forbes Co	15
Waterous Engine Works Co.	

Brick

American Enamelled Brick Co.	
Canadian Pressed Brick Co.	51
Don Valley Brick Works	7
Hamilton Pressed Brick Co.	10
Milton Pressed Brick Co.	
Port Credit Pressed Brick Co.	51
Toronto Pressed Brick Co.	

Bridges (Steel)

Canadian Bridge Co.	52
Cleveland Bridge Co.	52
Dickson Bridge Works	
Dominion Bridge Co.	52
Phoenix Bridge and Iron Works	53
Pennsylvania Steel Co.	52

Builders' Hardware

Taylor-Forbes Co.	15

Cement

Alsen Portland Cement Co.	58
Britnell & Co.	18
Bremner, Alex.	55
Canada Cement Co.	3
McNally & Co., W.	51
Morrison & Co., T.A.	56
Rogers, Alfred	4
Rogers Supply Co.	29

Conduits

	Page
Conduits Co., Limited	55

Concrete Pipe

Lock Joint Pipe Co.	

Concrete Mixers and Machinery

Canada Foundry Co.	10
Cropp Concrete Machinery Co.	6
Hopkins & Co., F. H.	60
Jenckes Machine Co.	2
London Concrete Machinery Co.	21
Mussens Limited	30
Morrison & Co., T. A.	56
Rogers Supply Co.	29

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co.	57
Canada Wire Goods Mfg. Co.	19
Hamilton Iron & Steel Co.	
Trussed Concrete Steel Co.	54

Contractors' Plant

Beatty & Sons, M.	19
Hepburn, John T.	32
H. & E. Lifting Jack Co.	
Hopkins & Co., F. H.	60
Katie Foundry Co	57
Marsh & Henthorn	49
Mussens Limited	30

Crushers (Stone and Rock)

Hopkins & Co., F. H.	60
Jenckes Machine Co.	2
Mussens Limited	30
Morrison & Co., T. A.	56

Corrugated Iron

Galt Art Metal Co.	
Metallic Roofing Co.	49
Metal Shingle and Siding Co.	20
Ormsby, A. B., Limited	5
Roofers Supply Co.	55

Contractors

	Page
McIlwraith, Jas. A.	56
Nadel & Adler	56

Drills

Beatty & Sons, M	19
Canadian Rand Co.	1

Deafening Felts

Cabot, Samuel, Inc.	51

Drilling Contractors

Harvey, J.	57

Dredges

Beatty & Sons, M	19

Engines

Canadian Boving Co.	2
Inglis, John	22
Jenckes Machine Co.	2
Leonard & Sons, E.	51
Mussens Limited	30
Waterous Engine Works Co.	

Excavators

Harris, J. W.	11

Electrical Apparatus and Supplies

Northern Electric & Mfg. Co.	19

Engineers (Civil and Mechanical

Barber & Young	56
Chipman & Power	56
Bowman & Connor	56
Farmer, John T.	56
Fuce, Edw. O.	56
Galt Engineering Co., John	56
Glaubitz, H. J.	56
Hunt & Co., Robt. W.	51
Inglis, John	22
Kennedy, Jas. C.	56
Lea & Ferguson	56
Mace, T. Harry	56
Mitchell, C. H.	56
McRae, John B.	56
Moore & Scollan	56
Taylor, James	56

Fire Apparatus

	Page
Morrison & Co., T. A.	56
Seagrave, W E.	53

Fireproof Doors and Windows

Douglas Bros.	14
Mussens Limited	30
Ormsby, A. B.	5

Gauges, Steam, etc.

Marsh, Jas. P.	1

Granite and Marble

Laurentian Granite Co.	56
Missisquoi Marble Co.	
Rogers Supply Co.	29
Smith Marble & Construction Co.	

Glass

Chance Brothers & Co.	12
Consolidated Plate Glass Co.	
Luxfer Prism Co.	2
Thompson & Co., B. & S. H.	12
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E.	51
Taylor-Forbes Co.	15

Hoisting Machinery

Beatty & Sons, M.	19
Inglis, John	22
Jenckes Machine Co.	2
Hopkins & Co., F. H.	60
London Gas Power Co.	59
Marsh & Henthorn	49
Mussens Limited	30

High Pressure Pipe Lines

Escher Wyss & Co.	54

Hydrants

Canada Iron Corporation	55
Gartshore-Thomson Pipe Co.	54
Kerr Engine Co.	

Interior Fittings

Lickleys Limited	16

Lime

Christie, Henderson & Co.	17
Jamieson Lime Co.	53

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

MODERN.

STRONGER.

CHEAPER.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in Canada for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

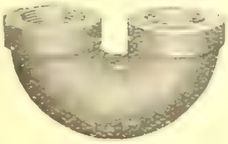
51 VICTORIA SQUARE,

MONTREAL.

MADE UP TO 40 FEET IN LENGTH.

RELIABLE

Semi Steel Fittings



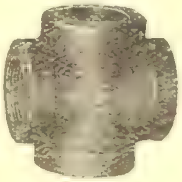
RETURN BEND

PIPEHANGES

Y BRANCH

REDUCER

HEADER



CROSS

A fitting for every purpose

TRY THEM

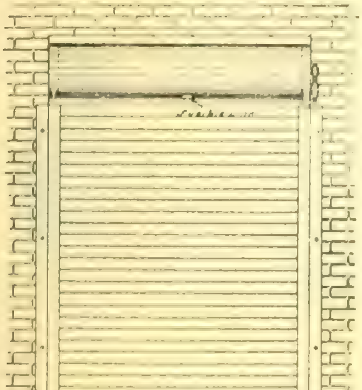
Standard Fitting & Valve Co.

Limited

GUELPH - ONTARIO

The Durability of our Rolling Steel Door

is extraordinary



At the N. Y. C. R. R. Sheds, 31st Street, New York, our **Rolling Steel Doors** have been in continual service **for over twenty-three years** and still give the very best of satisfaction. Durability and ease of operation are as big a feature in our Rolling Steel Doors as their Fireproof Quaiities. Specify our patented Rolling Steel Door. It has everything in its favor.

Experts in Fireproof Windows and Doors.

A. B. ORMSBY, Limited

Factories:

Cor. Queen & George Sts. TORONTO

677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:

Sand & Supplies, Limited,

Foot of Spadina Ave

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited

Hagersville - Ont.

Lumber and Interior Finish Page
[illegible] S [illegible] 58
[illegible] Limited 16
[illegible] Ltd 20
[illegible] & Sons, J. R. 21
[illegible] Bay Shook Mills 50
[illegible] & Co
[illegible] Floor Co 58
[illegible] Bros. 59
Tillson Co.... 18
Woodstock Lumber Co. 58

Metal Lath
Galt Art Metal 59
Metallic Roofing Co. 49
Noble, C. W 20

Meters
Hopkins & Co., F. H. 60
Neptune Meter Co............. 17

Paving and Paving Materials
Dominion Carbolineum Works.....
Metropolitan Paving Brick Co. .. . 21
Ontario Asphalt Block Co. 58
Silica Barytic Stone Co. of Ontario 57

Plaster
Albert Mfg. Co......... 15
Britnell & Co 18

Pipe
Canadian Pipe Co.............. 51
Dominion Wood Pipe Co.... 9
Gartshore-Thomson Pipe Co. 54
Munderloh & Co.......... 5
Municipal Construction Co 16
National Iron Works......... 55
Pacific Coast Pipe Co......... ... 1

Power Engines
Inglis Co., John........ 22

Paints
Cabot, Samuel, Inc 51
Canadian Supply Co. 18
Glidden Varnish Co...... 32
International Varnish Co. 15
Paterson Mfg. Co....... .. ....

Pile Driving Page
Lincoln Construction Co.... 53

Pumps and Pumping Machinery
Beatty & Sons, M.......... 19
Escher Wyss & Co................. 54
Goulds Pump Co...... ....•... 59
Hopkins & Co., F. H. 60
Inglis Co , John,............... 22
Leonard & Sons, E 51
Martin Steam Pump Co. ....
McDougall Caledonian Iron Works, John 29
Mussens Limited......... 30
Ontario Wind Engine & Pump Co. 19
Smart-Turner Machine Co. 1
Waterous Engine Works Co ......

Roofing Materials
Barrett Mfg. Co............ ......
Galt Art Metal Co. 20
Metallic Roofing Co........... 47
Metal Shingle & Siding Co. 20
Noble, Clarence W 20
Rogers Supply Co................ 29
Roofers Supply Co.......... 55

Railway Supplies
Factory Products Limited..........
Gartshore, John J..... 56
Hopkins & Co., F. H.... 60
Mussens Limited...... 30

Road Machinery
American Road Machinery Co. 11
Case Threshing Machine Co.. 11
Climax Road Machine Co.... 11
Morrison & Co., T. A 56
Mussens Limited. 30

Sewer Pipe
American Sewer Pipe Co...... 13
Britnell & Co 18
Canada Iron Corporation.... 55
Dominion Sewer Pipe Co...... 13
Gartshore-Thomson Pipe Co.. 54
Hamilton & Toronto Sewer Pipe Co. 13
Lock Joint Pipe Co....... ....
National Iron Works 55
Ontario Sewer Pipe Co.... 14
Rogers Supply Co............... 29
Standard Drain Pipe Co..... 13

Sand
Rogers Supply Co.... 29

Stone Page
Britnell & Co............. 18
Christie, Henderson & Co. 17
Consolidated Stone Co.... ....
Contractors' Supply Co.... 18
Corinthian Stone Co.... 17
Crushed Stone, Limited...... 51
Doolittle & Wilcox....... 55
Hagersville Contracting Co.. 5
Laurentian Granite Co..... 56
Maloney John................ 53
Morrison & Co., T. A.... 56
Myers, Oakley.......... 51
Rogers Supply Co...... 29
Roman Stone Co 17
Sackville Freestone Co. 9

Submarine Driver
Rouleau, Joseph N.,......... 57

Structural Iron and Steel
Dominion Bridge Co.......... 52
Hamilton Iron & Steel Co..... ....
MacKinnon Holmes & Co. 53
Pennsylvania Steel Co....... 52
Phoenix Bridge & Iron Works 53
Reid & Brown.... 56
Salter, W. H............. 53

Shovels (Steam)
Beatty & Sons, M........ 19
Canada Foundry Co.... 10
Hopkins & Co., F. H......... 60
Mussens Limited........... 30

Shingle Stains
Cabot, Samuel, Inc..... 51

Roofers Supply Co.......... 55

Steel Shingles and Ceilings
Galt Art Metal Co............. ....

Smoke Stacks
Leonard & Son, E...... 51

Safes and Vaults page
Taylor, J & J 53

Stone Cutters
Bailey-Underwood Co. 58

Sheathing Papers
Cabot, Samuel, Inc...... 51

Telephone Supplies
Northern Electric & Mfg Co.. 19

Tiles
Smith Marble & Construction Co .

Tanks and Stand Pipes
Inglis, John 22
Jenckes Machine Co.... 2
Leonard & Sons, E......... 51
Marsh & Henthorn.... 49
McDougall Caledonian Iron Works 29
Ontario Wind Engine & Pump Co. 53

Valves
Canada Iron Corporation.... 55
Gartshore-Thomson Pipe Co 54
Kerr Engine Co.............. ......
Marsh & Co, Jas................... 19
Standard Fitting & Valve Co...... 5

Ventilating System
Gardiner & Gaskill........... ......

Waterproofing for Cement and Brickwork
Cabot, Samuel, Inc. 51

Wire Rope
Dominion Wire Rope Co.... 60
Greening Wire Co., B.. 58
Smith, Thos. & Wm.......... 8

Wire Guards and Screens
Canada Wire Goods Mfg. Co. 19

Water Wheels
Canadian Boving Co..... 2

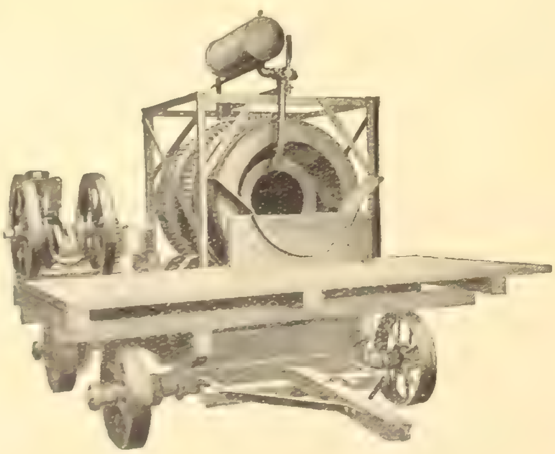
Water Turbines
Escher Wyss & Co................. 54

The Low Charging

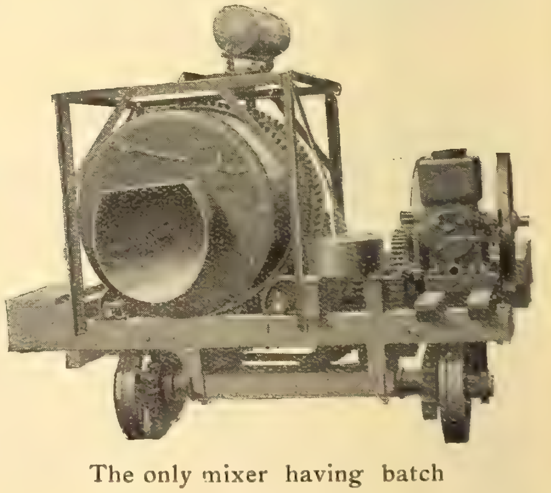
CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge
covered by Patent 947196.



Either
Steam or
Gasoline
Engine



Our Prices will
Interest You.

The only mixer having batch
constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street,
Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering	**Furring**
Arches	**Blocks**

T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick	Enamelled Brick
Vitrified Brick	Wire-Cut Brick

Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: David McGill, 206 Merchants Bank Chambers

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

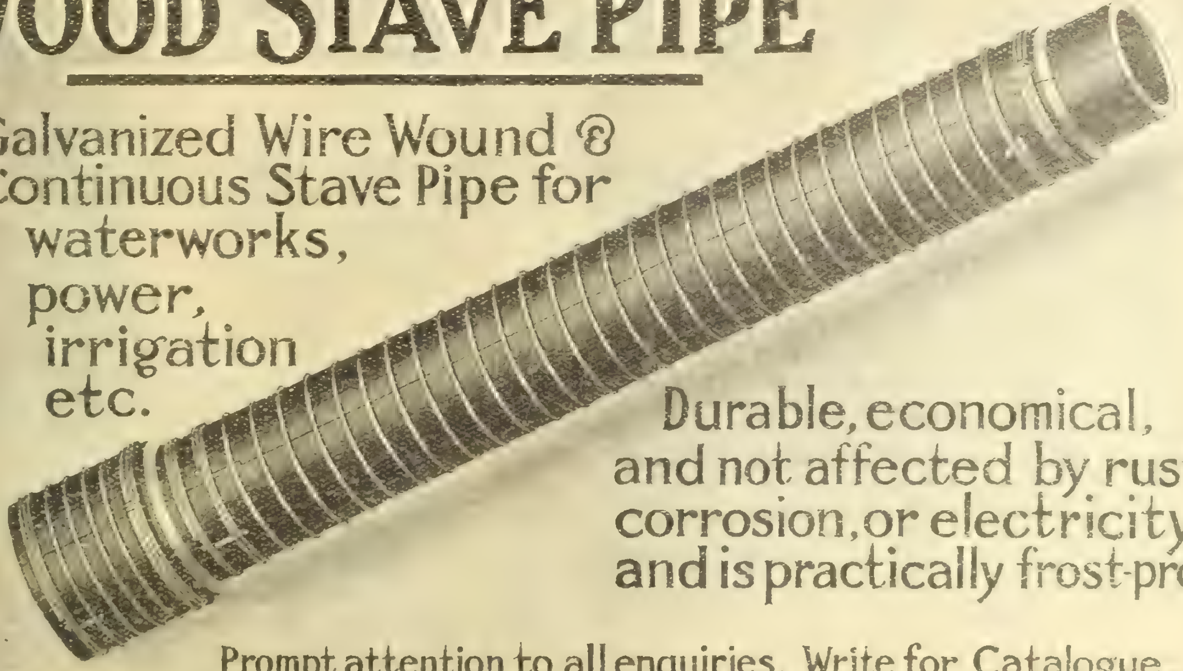
Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C. ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man. BAINES & PECKOVER, Toronto, Ont.

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.



Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

HENRY NEW, President. ROBERT W. NEW, Vice-President.

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company, Limited

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

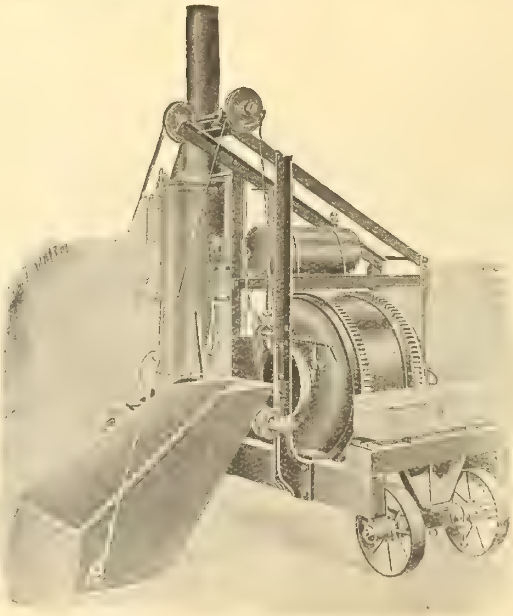
Koehring Concrete Mixers

Steam, Motor or Gasoline Drive

Simple in Operation

Substantial in Construction

Made in sizes to meet all requirements.



Koehring Mixers have proved their superiority by quick action — uniformity of mixture, and reliability under the most exacting conditions.

MANUFACTURED AND SOLD IN CANADA BY

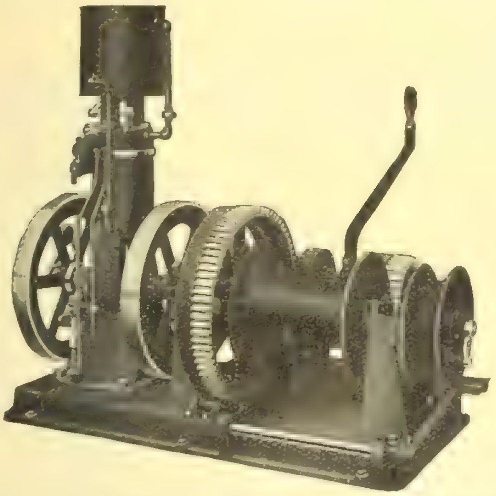
CANADA FOUNDRY COMPANY, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Climax Hoisting Engine

for running two platform Material Elevators

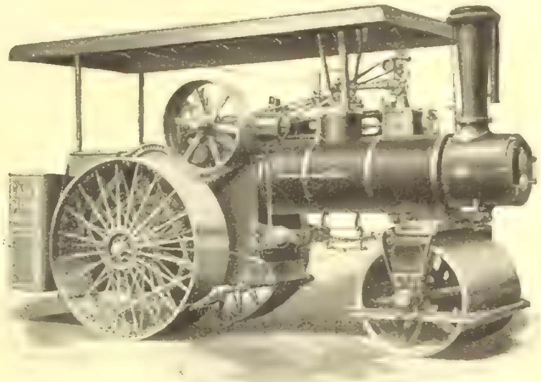


Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company
Hamilton, - - Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

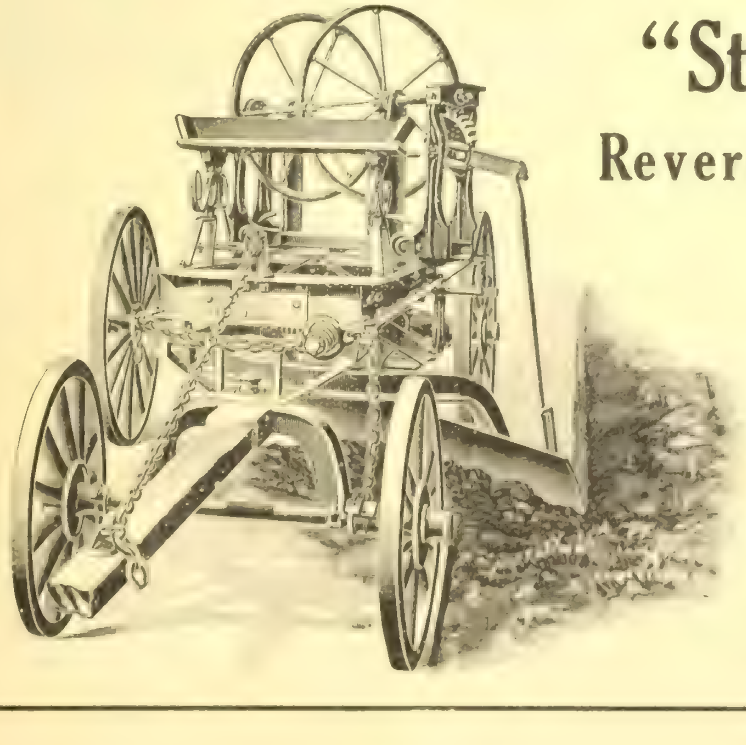
Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY if you do your Road Making with a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

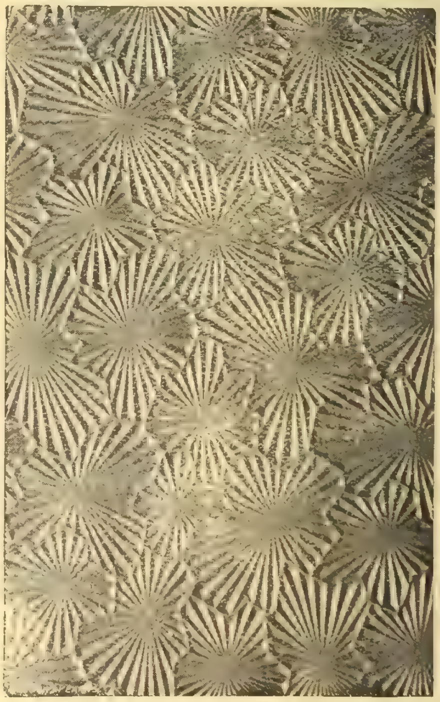
American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

Chance's
Double Rolled Cathedral Glass

is brighter and more translucent than the ordinary Rolled Cathedral Glass. It cuts true and easily, and works up handsomely into leaded windows. Made in a very large variety of tints.

Chance's Figured Rolled Glass is famous for its deep, brilliant patterns, easy cutting qualities and attractive tints. The popular "Muranese" pattern illustrated here is made in three sizes, of which this shows the smallest.



Chance's Figured Rolled
Muranese (small) Pattern

"Flemish" Glass, made only in the glass works of Chance Bros. & Co., near Birmingham England, is a new and most attractive Ornamental Window Glass, unsurpassed for character and brilliancy.

Write for samples of Chance's Figured Rolled, Muffled, Double Rolled Cathedral and Flemish Glass.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

J. H. NEW,
President.

RYLAND H. NEW,
Vice-President

Quality Is Our Leading Feature

Since 1860 our foremost thought has been to make the **best** sewer pipe **possible**, and today we feel that our ambitions have been **realized**. We believe so because many of the largest consumers **insist** on—

Hamilton Vitrified Salt Glazed SEWER PIPE

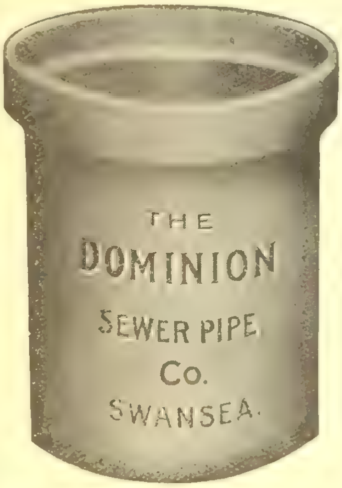
Is it not time for you to investigate?

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert Pipes

We manufacture [illegible] Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength [illegible] Culverts.

We also manufacture [illegible] Wall Coping, Flue Linings [illegible] Chimney Tops, [illegible] and all kinds of Vitrified goods.

Fire Clay Goods, [illegible] Bricks, [illegible] Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited

American Sewer Pipe Co.

General Offices: Akron, Ohio, U.S.A.

LARGEST MANUFACTURERS OF

Vitrified Salt Glazed Sewer Pipe

IN THE WORLD
FOR QUALITY

We Simply Invite COMPARISON

Standard and Double Strength

Sizes, 3", 4", 5", 6", 8", 9", 10", 12", 15", 18", 20", 22", 24", 27", 30", 33", 36", 42".

Vitrified Pipe is SANITARY, Most Substitutes are NOT, because they are Porous

Address for Prices, Etc., our Boston Office

201 Devonshire St., Boston, Mass.

Do You Want Sewer Pipe

Before Winter Sets In?

PRICES ALWAYS RIGHT

We still have a large and

Complete Stock

with which to

Fill Orders Promptly

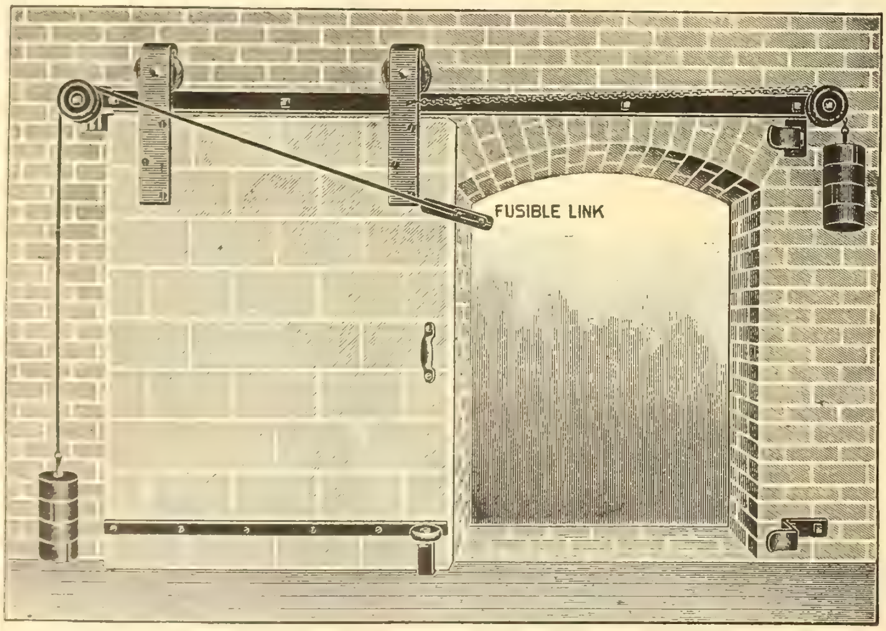
and

we will pay for your telegrams if

you are in a hurry

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones:—Toronto Connection, Park 422—Evenings, Park 3888 and 3889

Level Slide Fire Door



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

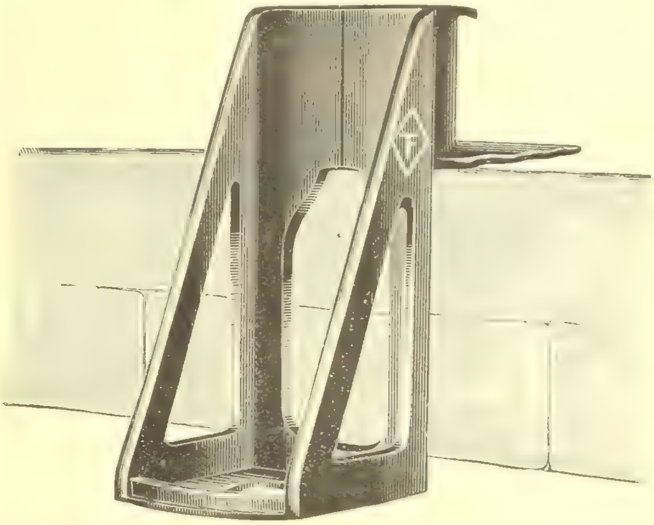
"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Builders' Joist Hangers
ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished
TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

Business Insurance

How is business built up and reputation acquired?

Every Architect and Contractor must answer that question in the most practical way.

The degree of **his** success **depends** altogether on **the service rendered** and the **goods specified** or **recommended.**

There's no escaping **that** conclusion.

Naturally, we believe **International Varnish Products** are the best of their class you **can** specify or recommend.

Prejudiced we may be, but we have logical reasons for the faith that is in us.

You see we have been manufacturing varnishes, enamels, stains and finshes for over forty years.

We have worked hard and spent money like water to perfect our products.

And **many** prominent Architects and Contractors **declare** that **we have succeeded splendidly.**

We do not ask you to take our word.

Send us your name and address and we'll mail you a nickle steel bound book that actually shows things.

When you specify or recommend International Products you practically take out a policy insuring success. The quality of the goods is known and

International Products are always sold in Full Imperial Measure Cans.

International Varnish Co., Limited
TORONTO WINNIPEG

The Municipal Construction Co., Ltd.

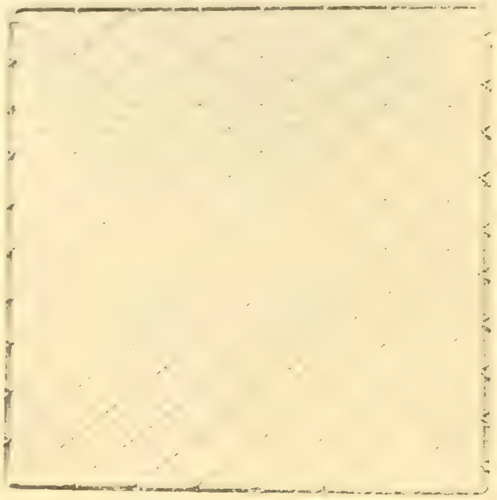
Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

Our Specialties

- Special Mantels
- Staircases
- Panelling
- Bank Fittings
- Office Fittings
- Glass Partitions
- High Class Doors
- House Fittings

Phone Main 3166 After Business Hours College 1097

Lickleys Limited

MAIL BUILDING
TORONTO

Estimates Given.

We supply Contractors with high class Interior Fittings of all kinds.

Enquiries for Ontario and East should be addressed to
LICKLEYS Limited,
Mail Bldg., Toronto

For Winnipeg and District,
J. MALCOLM SUTTIE,
Travellers Bldg.
Winnipeg

For British Columbia,
E. V. ALBURTY & CO.,
Dominion Trust
Bldg., Vancouver

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED

All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Corinthian Stone

can be supplied in any size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low   Quality is High

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 604 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C. P. R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Casco Anti-Rust Paints

Are Specially Prepared

For Protecting

- Structural Iron Work
- Steel Bridges
- Metal Sidings
- Water Towers, Etc.

For Waterproofing

- Roofs of all kinds
- Smoke Stacks
- Boiler Fronts
- Steam Pipes
- Hot Water Pipes

Guaranteed:

Chemically Pure. Free from Acids. Will not check, chip, blister or wash off

RED GREY BLACK GREEN

For Protection of Wood and Metal

Canadian Supply Company

220 King Street West - - - - Toronto

House Trim, Doors, Etc.

in

Chestnut, Pine, Hardwood

Our prices are based upon small profits and always represent full value. Small orders at low prices are invited.

The Tillson Company
Limited
Tillsonburg - Ontario

The

Willson Portable Flare Light

Good contractors know that it always pays to get the best appliances.
The Willison Portable Flare Light, which is specially adapted for use in all kinds of construction work, cannot be beaten in efficiency or cost. Think of it, this light gives a candle power of 8,000 at a cost of less than six cents an hour.

International Marine & Signal Co.
Limited
OTTAWA - CANADA

The Original

MARSH-PAUL AIR VALVE

Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture — also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our WINDOW GUARDS

Insist on having HARD STEEL WIRE

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

FIRE-ALARMS THE NORTHERN ELECTRIC AND MFG. CO LIMITED TELEPHONES SUPPLIES

Inter-phones

Inter-phones will connect all your departments—bring all the strings of your business to your own office chair—and make it possible for you to get in touch with any of your employees—or for them to get in touch with each other—at a second's notice and without loss of time.

No. 2016 - Type-Metal Inter-phone for desk use

No. 1324 Non-Flush Type-Metal Inter-phone for wall mounting

Inter-phones cost little to install and operate at a low maintenance charge. The minutes they save will pay over and over again the cost of their installation and operation.

On request we will be glad to send you **free** Bulletin No. 1042 with full particulars.

THE Northern-Electric AND MANUFACTURING CO LIMITED

Manufacturers and suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone, Fire Alarm, and Electric Railway Plants. Address our nearest house.

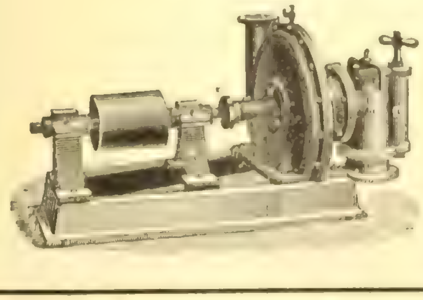
Montreal Toronto Winnipeg Regina Calgary Vancouver

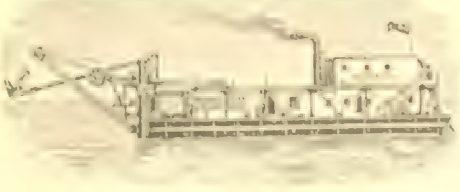
M. Beatty & Sons, Limited — Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.





Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Another reason for the phenomenal Herringbone sales

Because Herringbone Lath is not Wasted in lap

Best because it goes farthest

The Herringbone sheet which is 8 feet 1½ inches long is billed as 8 feet 0 inches.

The additional 1½ inches means one row of end staples for two sheets.

It means 2½ inches possible error in location of end stud without waste of lath.

Herringbone lath measured erected shows the full quantity invoiced.

It also makes wiring of adjacent sheets between studs unnecessary.

The Herringbone interlocking selvage edge eliminates side lap.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

The mails are bringing us record-breaking orders for

PRESTON SAFE-LOCK SHINGLES

We wish to thank the builders and contractors for the many orders they are giving for PRESTON Safe-Lock Steel Shingles. We are glad that the superior merits of PRESTON Shingles are recognized by the building trade.

We have done everything in our power to make PRESTON Safe-Lock Steel Shingles the top-notch roofing material. They are made and galvanized according to British Government specifications. They are safe-locked on all FOUR sides. They are unaffected by strains due to shrinking of sheeting or settling of building. Completely proof against rain, snow, wind, fire and lightning.

A booklet explaining their superior construction will be mailed free on request.

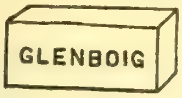
Metal Shingle and Siding Company, Limited
Preston, Ont.

Branch Office and Factory:
Montreal, Que.

For

Fire and Furnace Purposes

there are no better bricks than



or

Brands

For Building Purposes

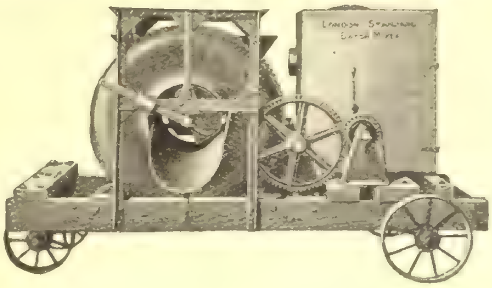
where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb, 13 St. John St.
Montreal

London Standard Drum Batch Concrete Mixer



The very latest ideas and improved plans of construction are embodied in this machine. CONTRACTORS it will be well worth your while to write for full particulars.

We Can Save You Money {
On the first cost of machine
Cost of maintenance
Cost of producing Concrete

This machine is manufactured in several sizes and with every equipment desired. Let us tell you all about it. State capacity required when writing. We also manufacture the now famous LONDON AUTOMATIC BATCH MIXERS No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full Line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

"Empire Brand"

ensures a perfectly smooth hardwood floor which will be "a thing of beauty and a joy forever." If you want your clients to speak of you as "a fellow who always uses the best materials obtainable," specify

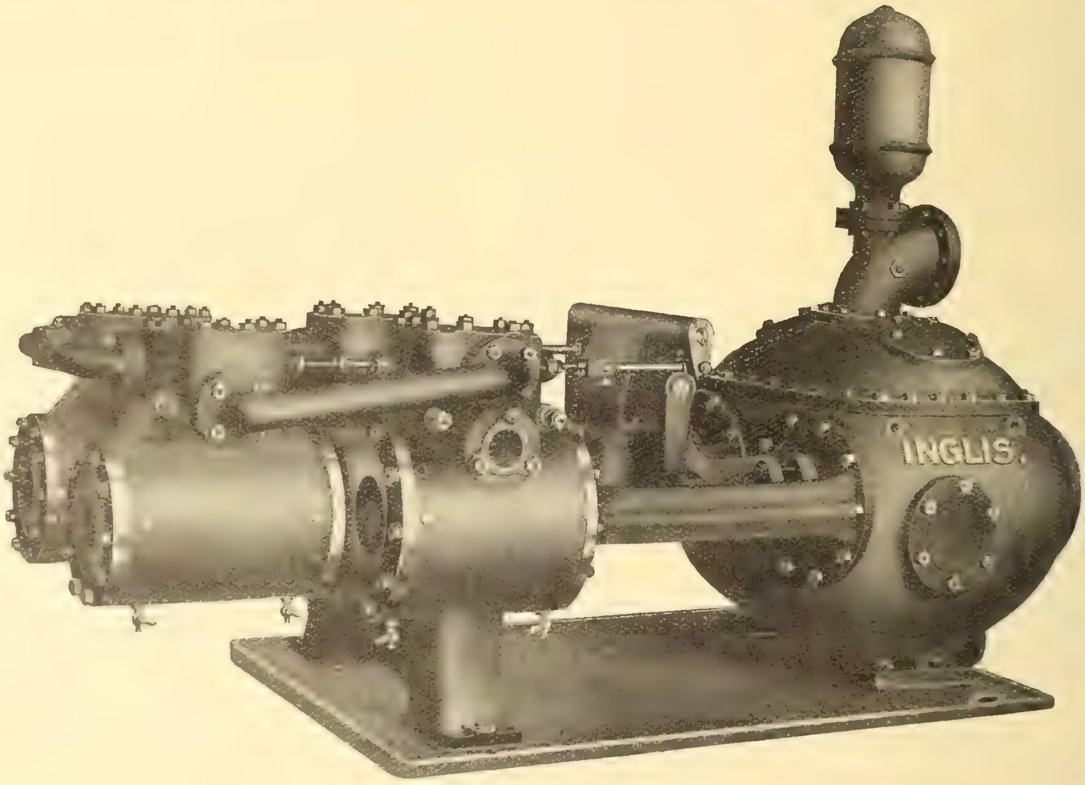
"Empire" Brand

every time.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent
The Hardwood Flooring Co., 55 St. Francois Xavier St.

PUMPING MACHINERY



Compound Duplex Direct Acting Pumping Engine

We build Pumping machinery of all kinds and for all requirements. Experience should be considered when installing a pumping plant. We have built a great many throughout Canada and will gladly refer any corporation who are prospective purchasers to cities, where our our pumps are operating and giving entire satisfaction. Built in sizes from one to thirty million gallons per twenty four hours.

Write us for photos and particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aylmer, Que.

The town council will be requested to extend the waterworks to the summer resorts, Echo Bay and The Cedars.

Burnaby, B.C.

Re the proposed Burnaby water system and costs, Mr. McPherson, municipal engineer, reports proposed area to be 2,841 with 42 miles of reads; cost, $150,000, of which the details are as follows: Wood pipe, trenching, laying and backfilling, $105,000; connections, $5,000; complete Kewanee plant, tank and two pumps, $5,000; engineers' fees, $7,000; pump house and miscellaneous work, $10,000. Messrs. Wearts, Sanderson and George were appointed as a committee to act in connection with the committee appointed by the Burnaby council regarding the matter.

Chilliwack, B.C.

The Young street expropriation by-law was defeated.

Hamilton, Ont.

It will be necessary for the reconstruction of the Hess street sewer, owing to the accumulation of iron rust. Estimated cost, about $2,000.

Hull, Que.

Mr. A. Earley has been instructed to prepare estimates of the cost of a sewerage system for Wrightville and Walkerville, in Hull.

Lachute, Que.

The ratepayers decided to purchase the waterworks system of the Laurentian Water & Power Company and also sanctioned the loan of $20,000 for the improvement of the system. R. T. Leclerc, Montreal, effected the sale.

London, Ont.

It is probable that the cement work on Dundas and Richmond street pavements will be done by the city. The Barber Asphalt Company have the contract for resurfacing these pavements, but no contract has been awarded for doing the cement foundation work.

Moncton, N.B.

The council is considering the construction of a reservoir to cost $200,000 to $250,000.

North Vancouver, B.C.

Tenders [illegible] for clearing and grading [illegible] the Marine Drive [illegible] Plans, etc., with J. R. Cosgrave, district engineer.

Tenders addressed to the City Clerk will be received until January 3rd for the installation of [illegible]. Pipe will be laid in about nine streets. Geo. Hanes, city engineer. Vitrified pipe will be used, it is stated, [illegible].

Oak Bay, B.C.

Tenders addressed to H. [illegible] street, Victoria, municipal engineer, will be received until December 27th for supplying British cast iron water pipe and special castings.

Point Grey, B.C.

Tenders addressed to H. Floyd, C.M.C., Kerrisdale, will be received until December 29th for supply of special castings. Specifications, etc., at office of the engineers, Cleveland & Cameron, 506 Winch Building, Vancouver. Time extended to Jan. 11th.

Also until Jan. 11th tenders for valves and hydrants will be received.

Toronto, Ont.

The City Engineer was asked to report on the probable cost of widening Bloor street west from Dundas street to High Park.

Victoria, B.C.

The ratepayers will be asked to vote shortly on a by-law providing for the development of Sooke Lake as a source of water supply for Victoria.

Tenders are called until January 1st, 1911, for the reorganization, improvement and extension of private water supply system on country property, including trenching, damming, concrete tanks and machinery for purposes of home and farm supply and water power. Address 722 Colonist Office.

Vancouver, B.C.

The C. P. R. will install waterworks in the section known as the railway reserve. Approximate cost, $4,890. Agreement is pending.

Bids will be asked on pipe in the proposed improvement of waterworks, as all other work will be carried out by day labor. Wm. McQueen, City Clerk. W. A. Clement, City Engineer.

It was decided to call for tenders for laying the lateral sewers south of Broadway to connect with the Yukon street trunk sewer and its branches. The engineer promised to present estimates for lateral connections for the Glen Drive sewer.

Winnipeg, Man.

Tenders for the immediate construction of sewers on Carter avenue from Wolf to Cameron and on Wolf avenue from Carter to Nairn, and for the construction of water mains on Salter street, on Ellice avenue from Ingersoll to Garfield street, and on Helen from Rathgar to Merrion, will be called at once.

AWARDED.

Kipp, Alta.

The Munderloh Company, Montreal, have secured an order for 16,000 feet of Mannesmann seamless steel piping for purposes of water distribution at the Chanook collieries [illegible] been delivered to Western Canada.

Prince Rupert, B.C.

[illegible] piece of rock work undertaken as yet in the new northern city. The company will commence work at once and expect to complete the job within ninety days.

Winnipeg, Man.

Contracts for sewers and water mains amounting to over $107,000 were as follows: Main trunk sewer on Clifton street, from Portage to Sargent avenues, Thomas Kelly & Sons, $92,991. Thomas Jackson & Sons, sub-main sewer on Sargent avenue, from Clifton to Strathcona streets, $6,437. All the other contracts—five in number—were awarded to the engineer of construction, his tenders being the lowest in each case.

The following engines for the National Transcontinental Railway for power house equipment in Winnipeg shops will be built and installed by the Goldie & McCulloch Company, Limited, Galt, Ont.:—Three 21 inch and 34 inch by 30 inch, 750 i.h.p. cross compound, heavy duy non-condensing Corliss engines, each direct connected to one 500 k.w. three-phase 60-cycle generator, speed 150 r.p.m.; one 18 inch by 30 inch 375 i.h.p. heavy duty, simple non-condensing Corliss engine, direct connected to one 250 k.w. three-phase, 60-cycle generator, speed 150 r.p.m.; one 14 inch by 30 inch, 225 i.h.p. heavy duty simple non-condensing Corliss engine, direct connected to one 150 k.w. direct current generator, speed 150 r.p.m.; two 11 inch by 12 inch (exciter) side crank, non-condensing Ideal engines, direct connected to 75 k.w. d.c. generators, speed 275 r.p.m., 115 h.p. each.

Railroads, Bridges and Wharves

Belleville, Ont.

The Roads and Bridges Committee of County Council presented a report which showed $403,000 was required to rebuild the present wooden bridges in order to make them up-to-date structures.

Guelph, Ont.

In regard to the settlement of the controversy between G.T.R. and city, the city gets $9,000 for Jubilee Park and a number of concessions from the company, the most important of which is that the company builds a foot subway at Neeve street, to cost about $2,500. They did not say when building operations on the station might be expected to begin, but stated that they [illegible] the settlement, so that it might be approved of by the Railway Commission at its next sitting in Toronto.

London, Ont.

A plebiscite will be taken on the advisability of building [illegible] Thames to connect South and West London.

Margaree Harbor, N.S.

[illegible] the Public Works Department, Ottawa, for [illegible] water here.

North Vancouver, B.C.

[illegible] Narrows have just been finished by the [illegible] and the results are reported as very satisfactory.

Owen Sound, Ont.
The ratepayers will vote on by-law to provide [illegible] for a new permanent bridge at [illegible] street and a wooden bridge [illegible] street.

Prince Rupert, B.C.
It has been decided by the Provincial Government to invite tenders for construction of the overhead approaches to the Government wharf at Prince Rupert.

Quebec, Que.
Tenders addressed to W. D. Baillairge will be received until January 11th for construction of a steel swing bridge over St. Charles river. Bids must be for bridge complete, including substructure, superstructure and approaches.

Regina, Sask.
The G.T.P. will make this city an important divisional point for three of its branch lines.

Vancouver, B.C.
Plans have been submitted to the bridges committee for the proposed viaduct connecting Harris street with Georgia street with a "Y" extension from Dunsmuir street connecting with the viaduct proper, and the proposed bridge crossing False Creek at the foot of Burrard street. The cost of the former structure is estimated at $551,250 by City Engineer Clement, while that of Burrard street will cost approximately $600,000 for a steel structure. An estimate of the cost of a reinforced concrete bridge, prepared by Mr. George H. Webster, from Burrard street to a point west of the Lulu Island tram bridge at Kitsilano, is $1,000,000. The matter was referred to the finance committee. Should it be decided to go ahead with the work of erecting either of these bridges it will be necessary to make application to the Dominion Government for the right to open Creelman avenue through to the waterfront, thus giving access to Kitsilano and West Fairview.

AWARDED.

Calgary, Alta.
It is stated that the Parsons Construction Company has been awarded the contract by the C. P. R. for an overhead bridge, $35,000.

Lethbridge, Alta.
The Board of Railway Commissioners has authorized the building of two new bridges west of Lethbridge by the C. P. R., one at mileage 2.6 and the other at mileage 10.6. Both bridges will be built of steel and reinforced concrete and will be of the most modern construction in every respect.

Vancouver, B.C.
Press reports state that Eslick & Hartnett, of Spokane, Wash., have secured contract from the Canadian Northern Railroad Company for the construction of 52 miles of rock construction, at a cost of about $250,000.

Victoria, B.C.
The contract for the construction of the new government bridge over the Thompson river at Walnachin was awarded to the Algoma Street Bridge Company, of Winnipeg, whose tender for foundation, substructure, superstructure, manufacture and installation complete was $33,272. The company's representative in this province, Mr. M. B. Stone. The bridge is to be four hundred feet long with one central pier.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.
The ratepayers will vote on January 3rd on a by-law regarding a site for the new Government buildings.

Brockville, Ont.
Local members of the Order of Orangemen have decided to erect a temple in memory of the founder of the order in Canada. Estimated expenditure, $40,000.

Brandon, Man.
On December 20th the ratepayers will vote on a by-law to issue $50,000 5 per cent. 30-year school debentures. Harry Brown, City Clerk.

Blanchard, Man.
On December 20th a by-law will be voted on to issue $7,000 20 annual instalment, 5 per cent. debentures, for the purpose of building a municipal hall. G. McIntyre, secretary-treasurer, rural municipality of Blanchard, Man.

Cranbrook, B.C.
The by-law to build city hall was carried. Estimated expenditure, $15,000.

Calgary, Alta.
Plans for a public abattoir have been prepared. Estimate cost, $25,000.

Chilliwack, B.C.
The citizens have taken steps towards the erection of a Y.M.C.A. building here. Details of plan have not yet been decided upon. M. H. Nelems, Westminster Trust Building, is interested.

Edmonton, Alta.
The architect for Heminick street school building was instructed to prepare drawings showing on the plan 12 rooms with provision for addition of wings.

Fort William, Ont.
The board of health forwarded to the council a resolution advocating the erection of an incinerator plant at the earliest possible date.

Guelph, Ont.
At the conference of the special committee appointed to consider the question of the rebuilding of the county buildings, it was decided to do nothing for at least another year. Noted in issue of Nov. 23rd.

Hull, Que.
Mayor Fontaine and a committee are arranging for the erection of a hospital.

Hillsboro, N.B.
Tenders addressed to Jordan Steeves, chairman of committee, will be received until January 6th for construction of the First Hillsboro Baptist church. Plans, etc., at office of above; also at H. H. Mott's, architect, Germain street, St. John.

Hamilton, Ont.
The County Council has decided to purchase the Newitt farm, near Dundas, as a site for a House of Refuge, and to refuse to take the NcNiven farm in Ancaster.

A by-law will be voted on to issue $7,500 4 per cent., 10 years, debentures for the erection of a Detention Home for Children. S. H. Kent, City Clerk.

Hull, Que.
It is reported that the Government has secured options on a number of properties in Hull. It is said in some quarters that the land will be used as a site for a new Printing Bureau, but in others it is believed more probable that it will be used for a new public works yard.

Ilderton, Ont.
The congregation of the Methodist Church here have decided to rebuild their church recently destroyed by fire.

London, Ont.
A by-law to set aside $75,000 to erect a new city hall will be voted on by the ratepayers in January next.

The faculty of the Western Medical School will consider the matter of a new building for the Medical School at their annual meeting in April next.

Montreal, Que.
The Witner Club, Limited, with a capital stock of $149,000, has been incorporated, and will erect a large club house on the old Eady property, stretching from Drummond to Stanley streets. The building will be commenced in the spring and opened in 1912. Those interested in the incorporation are Mr. Henry Joseph, Sir H. Montague Allan, Sir Edward Clouston, Sir Thomas Shaughnessy, Messrs. E. T. Galt, C. M. Hays, F. E. Meredith, H. V. Meredith, Hugh Paton, James Ross, C. F. Smith, F. W. Thompson, H. S. Holt and G. R. Hooper

A new church for the Italian Roman Catholics of Montreal will be erected, and plans and specifications will shortly be submitted to the Archbishop for approval. It will be known as Notre Dame Delia Defiesa.

Mr. Theo. Daoust, architect, 90 St. James street, is preparing plans and specifications for the proposed alterations to the old building of the post office, facing on St. James street. The estimated cost of the work is $140,000, and the building will be fireproofed and up-to-date when completed.

New Westminster, B.C.
The Royal Agricultural and Industrial Society are calling for tenders for the completion of the horse show building at Queen's Park.

Ottawa, Ont.
Tenders will be called next month for the brick work of Bethany Presbyterian Church. The building is to be brick inside and outside. J. A. Ewart, architect.

The Rideau Curling Club, of which J. A. McShado is president, will put a new roof on its rink.

Tenders are called until December 19th by the Public Works Department for supply of fittings, racks, etc., for Ottawa Military Store Building. R. C. Resrochers, secretary.

Peterborough, Ont.
The members of Charlotte Street Methodist Church will canvass for funds to add to the $25,000 already raised for the building fund.

Quatsino, B.C.
This municipality is erecting a town hall, the residents supplying the labor.

Stratford, Ont.
The by-law, providing $15,000 for the erection of a market building has been dropped.

Scott, Sask.
On December 10th the following by-laws will be voted on:—$9,000, 20 years, 5½ per cent., fire hall and town hall debentures, and $6,000, 20 years, 5½ per cent., hospital. C. F. Street, secretary-treasurer.

Thornbury, Ont.
Tenders will be received by Ed. Dorke, town clerk, to Dec. 11th, for the several trades required in the erection and com-

pletion of an agricultural exhibition in the town of Thornbury. For further particulars see advertisement in the "Tenders and For Sale" Department of this issue.

Toronto, Ont.

Tenders addressed to the chairman of the building committee will be received until December 26th for the erection of a nurses' home for the General Hospital. Darling & Pearson, architects, 2 Leader Lane.

It is announced after a conference between representatives of the Ontario Government and the University of Toronto that $400,000 will be expended upon the erection of the Royal Ontario Museum.

Victoria, B.C.

Tenders were called until December 6th for construction of additional wing to the Victoria West School. W. Ridgway Wilson, architect.

Vancouver, B.C.

Tenders for erection of the Isolation Hospital, plans for which have been prepared, have to be ready by December 19. Building Inspector Jarrett.

Plans for a new club house for the Vancouver Rowing Club have been prepared and discussed. Estimated expenditure, $15,000. J. Fyfe Smith, 440 Seymour street.

Plans have been prepared by Building Inspector Jarrett for the morgue and call for a building two storeys, of reinforced concrete. Estimated cost, $25,000.

The Vancouver Commercial Club, it is announced, will erect shortly a 10-storey steel and fireproof building, part of which will be used for club purposes. Option has been taken on Pender street. President, Dominic Burns.

Tenders for the construction of Isolation Hospital addressed to Wm. McQueen, city clerk, will be received until Dec. 19th.

Winnipeg, Man.

Tenders addressed to the chairman, Board of Control, will be received until December 15th for supply of furnishings required for the new Tuberculosis Hospital now in course of erection. M. Peterson, secretary.

AWARDED.

Edmonton, Alta.

E. L. Gutierrez, Edmonton, has secured the contract for erection of school, S. D. 2292, Edmonton Highlands.

Moncton, N.B.

Messrs. P. J. LeBlanc and O. J. Dunham have secured the contract for the new wing to be added to the post office building. The terms of the contract call for completion of the work on April 15th, 1911.

Strathroy, Ont.

The proposal to erect a county hospital here was laid over for the new council in January.

Toronto, Ont.

It is announced that a plan will be submitted to the members of the Toronto Amateur Athletic Club providing for the erection of a suitable down town club house. Dr. W. G. Wood is interested.

Residences

Belleville, Ont.

A fine residence, owned and occupied by Mr. L. G. Lewis, of Sidney Township, was destroyed by fire on the 8th inst. Loss, about $4,000.

Montreal, Que.

Mr. G. E. Gudewill, of the Canada Iron Corporation, will erect a handsome house on the lot adjoining his present residence on Bishop street. The plans are now being prepared. The exterior will be built of Indiana sandstone.

Ottawa, Ont.

Among the recent permits for buildings were: John Campbell, dwelling, Sunnyside avenue, J. E. Wilson, architect, $2,500; G. S. Green, dwelling, Nelson street, $3,800; Mrs. John Cowan, dwelling, Adelaide street, $3,500; W. H. Craig, dwelling, Oakland street, $3,000; Center street, $2,500; Melgund street, $3,000.

St. John, N.B.

Plans are now being prepared for conversion of the new Victoria Hotel building in Prince William street into an apartment house. An option has now been secured from the McCoskery estate, on the lot adjoining to the south. L. P. D. Tilley is interested.

Toronto, Ont.

Recent building permits include:—J. Grandin, three attached two and one-half storey brick dwellings on Fermanagh avenue, $7,500; J. T. Baldwin, three pairs semi-detached two-storey roughcast dwellings, brick fronts, Sarah and Pretoria, $12,000; Frank Cuneo, one pair semi-detached two-storey brick stores and dwellings, Dundas street, $5,000; Mr. McCabe, one pair semi-detached two and one-half storey brick dwellings, Christie street, $4,500; Dundas Building Company, three pairs semi-detached two-storey brick dwellings, southwest corner Franklin and Ruskin, $12,000; Mrs. J. Wheller, one pair semi-detached two and one-half storey brick dwellings, Sinclair avenue, $5,000; F. G. McBrien, two-storey brick dwelling, 126 Castle Frank road, $5,500; L. C. Sheppard, three pairs semi-detached two and one-half storey brick dwellings, Kenilworth, $15,000; Jackson & Brooks, twelve detached two-storey brick dwellings, Barber avenue, $33,600; J. H. Jackson, four detached two-storey brick dwellings, Fairview avenue, $11,200; J. McConnell, two-storey and attic brick dwelling, 89 Binscarth road, $6,000; A. O. Scott, three attached two-storey brick dwellings, Royce, $6,000; F. Courtemanche, three two-storey brick dwellings, Woodville, $6,000; J. H. Stanford, four pairs semi-detached two-storey roughcast dwellings, brick fronts, Verral, $12,000; R. M. Case, one pair semi-detached two-storey and attic brick dwellings, Brighton, $5,000; Thos. J. Ford, three attached two-storey brick dwellings, near Dufferin, Armstrong, $6,000.

Vancouver, B.C.

G. R. Stinson, Burrard street, will erect a residence on Howe street.

Business Buildings and Industrial Plants

Coaticook, Que.

It is reported that Penman's, Limited, will extend their plant here in the spring.

Chilliwack, B.C.

The lot next the Westminster Trust building on Westminster has been purchased, with a view, it is said, of erecting on it a new concrete block in the spring. W. R. [illegible] effected the sale.

Edmonton, Alta.

A new six-storey office building is to be erected on Jasper avenue next year by the Northern Investment Agency, 21 Jasper west. They also announce that next year they contemplate erecting a six-storey building, which shall be used as offices for the company, and others.

Fort Frances, Ont.

The ratepayers will vote on January 2nd on a by-law to grant fixed assessment to the Shelvin-Clarke Company. Noted in last issue.

Guelph, Ont.

The G. T. R. state that they will proceed immediately to erect the new station.

Hamilton, Ont.

The Diamond Flint Glass Company has purchased a 10-acre block of land where three new buildings will be erected. The Egg-O-Baking Powder Company, of Regina, Sask., and the Robinson Box Company, of Lowell, Mass., will also locate here. W. Mulliss, commissioner of industries.

Lachine, Que.

The Dominion Cridge Company has taken option on properties adjacent to their works. Nothing definite has been stated regarding enlargement.

London, Ont.

It is understood that the hydro-electric repair shops will be erected here, also a large garage for storing the automobiles used in the service.

Maisonneuve, Que.

Tenders are being called for completing the work on the new factory of the United Shoe Machinery Company. The roofing of the building is still open for bids. H. C. Stone, architect.

Magrath, Alta.

The Taylor Karren Company's store at Magrath was destroyed by fire on the 5th inst. Loss, about $30,000.

Montreal, Que.

The new merger known as Canadian Explosives, Limited, with a capital stock of $15,000,000, will make its headquarters at Montreal. It is understood they will erect quarters here.

The new station at Place Viger for the C.P.R. Company will be enlarged to permit of two storeys, not called for in the original plans, being added. There will be a turreted roof and the architecture will be the same style as the present Place Viger station. John Stewart & Company, Westmount, are the general contractors, and Mr. W. S. Painter, of the C.P.R., architect.

Property at 235 to 237 St. James street has been purchased by Mr. Frank Trualsch. It is understood that in the spring a modern restaurant will be erected.

North Vancouver, B.C.

It is the intention of the Bank of British North America to erect a fine large bank building at the corner of 3rd street and Lonsdale, next spring.

Nanaimo, B.C.

Messrs. Fletcher Bros., Ltd., of this city and Vancouver, have purchased the Oddfellows' Block, which will be thoroughly remodelled.

Outremont, Que.

Inspector of Buildings [illegible] has plans and specifications ready for a [illegible] stone and brick building on the upper section of [illegible] for the [illegible]

Owen Sound, Ont.

The ratepayers will vote on January 2nd on a by-law to [illegible] the Canadian Heating & Ventilating Co., who purpose to extend.

Tenders and For Sale Department

City of Winnipeg Power Development

Electric Generator Wanted

[illegible] will be received at the office of the [illegible] DECEMBER 23RD 1910, for [illegible] Electric Generator, new [illegible] K.W. Capacity along with [illegible] for direct connection or for [illegible]

M. PETERSON,
Secretary.

[illegible] Office,
Winnipeg, Dec. 7th, 1910. 50-51

Tenders Wanted

Sealed tenders addressed to the undersigned, will be received up to SATURDAY, THE 21ST DAY OF JANUARY, 1911, for the several trades required in the erection and completion of an Agricultural Exhibition Building at the Town of Thornbury, Ont.

Plans and specifications can be seen at the Office of John Wilson, Architect, Collingwood, or at the Office of the Town Clerk, Thornbury.

The lowest or any tender not necessarily accepted.

EDWARD RORKE,
Town Clerk.

Thornbury, Dec. 9th, 1910. 50-51

We want to establish Tesco Marble Factories in the following Cities:

New York
Philadelphia
Indianapolis
Atlanta
Kansas City
New Orleans
[illegible]
Minneapolis
[illegible]
Seattle
Los Angeles
[illegible]
[illegible] Montreal
Winnipeg and Vancouver

Since Tesco Marble is a real marble in its analysis and surface appearance the demand has come from all sections of the United States and overwhelmed our present factory facilities in Milwaukee, consequently it becomes absolutely essential to meet the demands.

We are ready to open negotiations with responsible parties for the manufacturing rights in the above named Cities.

Our marble is thoroughly covered by patent rights exclusively our own, thus assuring you of absolute safety on your investment.

Tesca Marble is the marble of the age.

Best financial references required.

Full information regarding investment, profits, etc., will be mailed.

TESCO PRODUCTS CO.,
N. W. Norris, Pres.

Main Offices 1-3 Builders & Traders Exchange.
MILWAUKEE.

Grand Falls Company,. Limited, Grand Falls, N.B., capital $1,200,000; incorporated to acquire the water power, etc., and to construct, operate, etc., mills for the manufacture of mechanical and ground wood pulp, etc. Incorporators: Sir William Cornelius Van Horne, and Herbert Samuel Holt, both of Montreal; Redfield Proctor, Proctor, Vermont, U.S.A.; George Frederick Underwood, vice-president, International Paper Company, New York; James Robinson, mill owner, Millerton, N.B., and A. J. Gregory, Fredericton, N.B.

Business Buildings and Industrial Plants

Ottawa, Ont.

Building permit was issued for Blackburn building, $95,000. W. E. Noffke, architect; Howe, Horwood & Sutherland, contractors.

Orillia, Ont.

Plans for the four buildings for the Canada Keg & Barrel Company here are completed and tenders will be asked for shortly.

Port Dalhousie, Ont.

The G.T.R. elevator here was destroyed by fire on the 7th inst.

Portage la Prairie, Man.

The Merchants Hotel was badly damaged by fire on the 6th inst. Estimated loss, $50,000.

Port Arthur, Ont.

Negotiations are being carried on regarding the establishment of a car repair plant here. R. L. Jones and J. L. Neilson, both of Winnipeg, are interested. F. G. Neill, publicity commissioner.

Peterborough, Ont.

A by-law will be submitted to the ratepayers at the next municipal election regarding the agreement with the Bonner-Worth Company (Isaac Bonner), who purpose the erection of a plant here. Industrial Commissioner, Mr. Duggan.

Quebec, Que.

Mr. John Bowker will commence the erection of a 3-storey block at the corner of Broughton street and Wilcox for the Woods Motor & Taxicab Company. Mr. Elwood Watkins, architect.

Richmond, Que.

It is understood here that a new G.T.R. station will be built next spring.

Regina, Sask.

The old Rembler Paul farm has been purchased. It is understood the G. T. P. shops will be erected on it.

This city will become a most important divisional point for three of the branch lines of the G.T.P. A new station will be erected at 1½th avenue, costing with hotel $400,000. B. B. Kelliher, chief engineer,

Winnipeg, Man.

The Western Manufacturing Company plan to double their present floor space this winter. Estimated expenditure, $20,000. T. A. Wilson, manager.

Selkirk, Man.

The Fryer block on Eveline street was destroyed by fire on the 7th inst. Estimated loss, $3,500.

St. John's, Que.

The second Cluett-Peabody by-law granting an additional piece of ground to that company has been passed unanimously by the ratepayers. Engineers were at once engaged to report on the nature of the soil. The foundations have been started. Noted previously.

South Vancouver, B.C.

Mr. G. A. Horel has prepared plans for the 3-storey block to be erected for Webb & Young on Main street.

Sherbrooke, Que.

The E. & T. Fairbanks Company is about to call for bids for erecting additional buildings.

St. Boniface, Man.

The entire plant of the Rat Portage Lumber Company was destroyed by fire on the 7th inst. The loss is estimated at $200,000. Mr. D. C. Cameron, president and general manager, announced that the plant would be rebuilt at once, machinery having been ordered. He further stated that the mill at Rainy River, recently destroyed by fire, would be rebuilt.

Toronto, Ont.

The Imperial Flour Milling Company, recently granted a Dominion charter (capitalization $2,000,000), will erect as soon as possible a large mill and elevator. The site proposed is the present Alexander Brown Milling Company's. Aemilius Jarvis is interested.

Victoria, B.C.

It is announced that an addition of brick and concrete will be made to the Steam Laundry, View street, at once.

Plans for the building to replace the Five Sisters' Block, corner of Fort and Government streets, have been completed and are now awaiting the approval of the owners in England. Plans call for steel and reinforced concrete construction of six or eight storeys, to cost about $400,000. Thomas Hooper, architect.

The Alberta Pacific Elevator Company, Limited, have purchased 600 feet on the north bank of the Fraser River, near Hammond as a building site, it is understood, for an elevater. Sale effected by D. E. Brown-Maculay Company, Limited. Plans also point to the erection of another in the east end on the south shore of Burrard Inlet. Representative, Mr. L. P. Strong.

Property on Seymour street has been purchased, with a view, it is stated, of erecting thereon a large and tall building. Wm. Holden effected the sale.

It is stated that the Paterson Timber Company, acting for clients, have applied for a lease of Trinity street end and also permission to erect an overhead bridge across the C.P.R. tracks, thus allowing access to the waterfront. A large cereal mill costing about $250,000 is contemplated.

Tenders are being called by the B.C. E. R. Company for erection of passenger station, until December 21st.

The Western Union Tel. Company has sanctioned the expenditure of $6,000 in equipment for their offices here. J. G. Davies, local manager.

Welland, Ont.

It is stated that in the beginning of the new year work will be started on the new 3-storey block for Reeve John Goodwin.

By-laws to grant fixed assessment to the Hamilton Tube Company, Hamilton, and also to Mr. John E. Cutler, both of which purpose erecting new plants, will be voted upon at municipal elections.

Winnipeg, Man.

It is announced that the Canada Cement Company, Limited, of Montreal, has secured property in this city and will next year erect a large plant. Plans, etc., are not completed. It is stated that R. F. Jones will be manager.

The Temple building has been purchased with a view to extend the building next year. Sale effected by M. C. Birkeley & Company.

AWARDED.

Montreal, Que.

The contract for the glazing work in connection with the plant being erected at St. Timothee, P.Q., for the Canadian Light & Power Company has been awarded to W. E. Potter & Company, 26 Benoit street, Bontreal. General contractors, Geo. W. T. Nicholson, E. T. Bank building, Montreal. T. Pringle & Sons, Coristine building, Montreal, contractors.

The contract for the glazing work in connection with the new building being erected on Bleury street for Messrs. Caron Bros., has been awarded to J. P. O'Shea & Company, Et. Agathe street. Atlas Construction Company, general contractors, and MacVicar & Heriot, architects.

New Westminster, B.C.

The contract for the construction of the new Kelly-Douglas warehouse here has been let to J. C. Allen. Construction will start at once.

The contract has been let to H. M. Marshall for the erection of an apartment and buisness block on Eighth street for A. A. Hardman.

Ottawa, Ont.

M. M. O'Connell has been awarded the plumbing and heating contract for the building of George Matthews Company, Limited, on Rideau street. W. E. Noffke, architect.

J. R. Cameron has been awarded the heating contract for Barrett Brothers' building in Ottawa east. W. E. Noffke, architect.

Port Arthur, Ont.

The Imperial Construction Company has received contract for the preparation of a site for the iron clad industry of Canada, a branch of the American Iron Clad Company, to be located here. Capitalization, $350,000.

The contract for clearing in connection wiht the erection of the Enamel Works Co. has been awarded to the Imperial Construction Company. Work will start at once. Robert Greig, president. Publicity Commissioner, Neill.

Toronto, Ont.

A. B. Ormsby, Limited, received the following contracts: Kalamined [illegible] for the T. Eaton Company's new garage; roofing and galvanized iron work on the warehouse, Richmond street west, for the Consolidated Optical Company; a number of steel rolling doors for the Canadian Westinghouse Company, Limited, Hamilton, Ont.

Victoria, B.C.

Thomas Catterall has the contract for alterations to the interior of the Canadian Bank of Commerce, corner of Fort street and Government. Probable cost, [illegible]

Power Plants, Electricity and Telephones

Berlin, Ont.

An application will be made to Parliament for an act to incorporate a railway company under the name of the Imperial Traction Company, with power to lay out and operate lines from Hamilton to Guelph, Berlin, Stratford, St. Marys, London, Ingersoll, Woodstock, Brantford, Hamilton, with extensions.

Calgary, Alta.

This municipality has under consideration large extensions to the electric light and power departments, for which estimates will be prepared and a by-law submitted as early as possible in the new year.

The following tendered for supply of car bodies for the street railway: J. G. Brill Co., Philadelphia, $2,976.25; McQuire Co., Chicago, $2,830; Preston Car & Coach Co., $2,210.25; Ottawa Car Co., $1,940 (award given in last issue).

The conditions governing the securing of the power site near the junction of the Elbow river and Canyon creek are as follows: That $50,000 be spent in developing the power during the first year, 1911; that $100,000 be spent during the second year, 1912, for this purpose; that a minimum of 2,000 h.p. be developed by January 1, 1914; that a maximum of 5,000 h.p. should be developed after January 1, 1914, if the Minister of the Interior considers it necessary, or in the interests of the public; that the city pay a consulting engineer and inspector for the work, assume all risks and indemnify the crown for all againts all actions and submit the schedule of rates to be charged to the board of railway commissioners for approval.

Deseronto, Ont.

A by-law will be voted on at the municipal elections to authorize and confirm certain agreements between the Trenton Electric & Water Company, Limited, and this town.

Fort William, Ont.

Later advices state that the ratepayers will be asked to vote on a by-law to raise the sum of $67,000 for the purpose of further extending and improving the street railway. The ratepayers will also vote on the raising of $25,000 for the extension and improvement of the telephone system.

Edmonton, Alta.

Tenders addressed to John Stocks, Deputy Minister Public Works, will be received until Dec. 15th for supply of 25,000 tamarac telephone poles at Lamont, Spruce Grove, Stony Plain, etc.

Guelph, Ont.

A by-law to provide for the extension, etc., of the Guelph Radial Railway by issue of debentures for $30,000.

Galt, Ont.

A by-law will be voted on at the municipal elections to provide for the issue of $4,000 debentures required to provide for the local distribution of electric power, and for extension of the electric light system of the town of Hespeler.

Kingston, Ont.

The Light, Heat & Power Committee's [illegible] for street lighting passed council.

Listowel, Ont.

On Dec. [illegible] a by-law will be voted on to issue $5,000, 4½ per cent. electric light debentures. William Bright, clerk.

Mitchell, Ont.

[illegible]

Medicine Hat, Alta.

Work on the proposed power plant [illegible] about $50,000. A. Grimmer, city engineer.

Melfort, Sask.

On Dec. 27th a by law will be voted on [illegible] the purchase of certain lands and $3,000, 5 per cent., 20 year, telephone debentures. Reginald Beatty.

Nanaimo, B.C.

A by-law is being prepared authorizing the Nanaimo General Electric Railway Co. to build an electric railway over certain streets in Nanaimo, B.C.

Ottawa, Ont.

The Electric Department called for tenders on the 13th inst. for 60 ornamental posts; also 300 MacBeth Evans alba globes for 100 watt tungsten lamps.

It was decided to let the municipal electric department carry out the project for "the great white way" on Sparks street, and to do away with the poles and arc lamps at the street corners on that thoroughfare.

The Carleton County Councillors want the Ontario Hydro-Electric Commission to provide the county with electric facilities from water power in this district as it has done in Western Ontario from Niagara power.

Peterborough, Ont.

It is rumored that negotiations are in progress by which the Canadian Electric Power Company will purchase Burleigh Falls and Buckhorn water powers.

The ratepayers will vote at the municipal elections on a by-law to give permission to Mr. C. E. Dittman the right to lay mains on the streets to convey natural gas to the citizens should it be found in sufficient quantity in the vicinity to justify the [illegible].

Township of Preston, Ont.

On Jan. 2nd a by-law will be voted on to issue of $36,000, 6 per cent. debentures for the purpose of aiding the People's Railway. Thos. Laughlin, clerk.

Victoria, B.C.

A by-law providing for a loan of $25,000 for more electric light equipment will be submitted to the ratepayers at the municipal election.

Winnipeg, Man.

Tenders will be received by M. Peterson, secretary, Board of Control, to December 23rd, for the supply of direct current electric generator, new or second hand, 50 k.w. capacity, with steam engine for direct connection or for belt driving. For further particulars see advertisement in the "Tenders and For Sale" [illegible] issue.

The St. James Ratepayers' Association considered a proposition made by the John [illegible] put to the municipality of Assiniboia to run a railway at reasonable intervals on the streets which run north of the Portage road. They are willing to build the railway immediately the municipality will [illegible]

AWARDED.

Ottawa, Ont.

The Public Works Department of the Dominion Government [illegible] light the Woods building and the Canadian building [illegible] claimed that the government was being overcharged [illegible] ings, of which it is the tenant and therefore decided that the building be rented without light and contract direct with the [illegible]

Saskatoon, Sask.

[illegible]

Plaster-Rock Mining in Canada

Inquiries have been made regarding plaster-rock mining in Canada, for which the following information has been secured.

In Nova Scotia the total quantity of crude gypsum mined in 1908 was 254,540 tons, as compared with 351,611 tons in 1907. Of the total in 1908 about 87 per cent. was mined from quarries in Hants County, at Windsor, Walton, Cheverie, Noel, etc., the balance being quarried at St. Anns, Victoria County, and at Cheticamp, Iverness County. At Cheticamp the Great Northern Mining Company, under the management of M. W. Grandin, commenced operations in 1908. A mill was built, but the company did not begin to grind gypsum until the later part of September or to manufacture plaster of Paris until the middle of October. All goods manufactured were for the ports on the St. Lawrence, and shipments ceased on the close of navigation. The Victoria Gypsum Mining and Manufacturing Company carried on operations as usual at St. Anns, but with a somewhat reduced output. The Nova Scotia Cement and Plaster Company was organized to work deposits at Port Hastings, in Iverness, but nothing was done further than to strip the surface covering from the deposit. In Hants County the principal operators were the Wentworth Gypsum Company, the Windsor Gypsum Company, and Albert Parsons. Shipments were made also by the Newport Plaster Mining and Manufacturing Company, the Windsor Plaster Company, which operates a small mill, the Noel Plaster Company (W. B. O'Brien), and Lorenzo Ettinger.

In the Province of New Brunswick the principal shipper is the Albert Manufacturing Company, of Hillsborough. In addition to shipping a large tonnage of crude gypsum this company operated a large mill for the manufacture of plaster of Paris. The Hillborough Plaster Company also operates a quarry at Hillsborough, and from the Tobique River deposits in Victoria County, a small quantity of gypsum is annually quarried by John E. Stewart, of Andover, N. B. The total quantity of crude gypsum mined in New Brunswick in 1908 was 90,015 tons.

In Ontario 10,889 tons of crude were reported as having been mined in 1908. The Alabastine Company, of Paris, sells gypsum, crushed and ground, and manufactures plaster of Paris and special wall finishes under the name alabastine. The Imperial Plaster Company, of Toronto, quarried gypsum for its own use at Cayuga, while the Crown Gypsum Company built a crushing and calcining mill at York Mines, Onedia Township, and commenced to open up the properties formerly known as the Martindale, Taylor, and Donaldson mines.

The only operator in Manitoba is the Manitoba Gypsum Company, of Winnipeg. Ths company has a mill and calcining works at Winnipeg, while the quarry is situated at the north end of Lake Manitoba. The company has a narrow-gauge railway of its own from the mine to Lake Manitoba, and a small fleet of steamers and barges which bring the raw material from the head of the lake to Totogan, from which point it is brought to Winnipeg on the Canadian Northern Railway.

Ferro-Dovetail Plates

The new ferro-dovetail plates, manufactured by the Pedlar People, of Oshawa, fill a long felt want, as a means of saving cost and dispensing with the use of wooden centering for concrete floor sabs on a steel superstructure. To use them, it is merely necessary to lay out the steel arangement to a maximum of 5′ 6 or 6′ spans. Ferro-dovetail plates are supplied in sheets to fit these spans, allowing a 3″ end lap. At this end lap, the corrugations are spread so that the sheets will interlock. The builder lays ferro-dovetail plates for the steel superstruction just as he would lay planks, lapping and interlocking the plates at the edges. Then with a plank runway for his wheel-barrow, he may start to apply his concrete to the desired depth of the slab. As soon as the concrete is set, the under side of the plates is plastered with ordinary plaster.

As a roofing material in places where a roof is subject to deterioration from devasting gases, ferro-dovetail plates meet the requirements most satisfactorily. Moreover, they are particularly valuable where a roof is to be put up in a hurry, as they can be used for years as a corugated metal roof and then concreted.

Stiff Conditions on Prince Rupert Contract

Tenders are being invited for the construction of a buoy depot at Prince Rupert, B.C., for the Marine and Fisheries Department. A notable feature of the contract is the insistence of the department on a schedule of current wages and working day hours.

The specifications include the erection of a reinforced concrete wharf with timber approach trestle, together with the necessary dreging, earthwork, stonework, stone filling, pitching, concrete, timber and track work. The wharf to be erected is 405 feet long and 40 feet wide, with an additional width of 15 feet over 105 feet of its length. The wharf is to consist of concrete piles, and these after having been driven in are to be carried up as columns erected in place and braced with horizontal and diagonal members. The tops of the columns are to be finished off at an elevation of 216.93 feet.

The fair wage schedule, signed by J. D. McNiven, fair wage officer, makes the following stipulations as to wages for a nine-hour day; concrete workers, $3.00; carpenters, $5.00; blacksmiths, $4.50; painters, $5.00; plumbers, $5.50; bricklayers, $6.00; engineers, $4.50; firemen, $3.00; machinists, $4.50; laborers, $3.00.

It is also stipulated that the contractor shall enter on the site and commence the works within 30 days after the signing of the agreement and that the works shall be completed on or before Dec. 1, 1911.

According to a dispatch from Ogeman, Sask., Neil Keith, a sub-contractor for the Lethbridge-Weyburn branch of the Canadian Pacific, is missing. The country has been searched for miles by the mounted police, but no trace of him can be found, and the conclusion has been arrived at that he perished in the recent storm. Mr. Keith has been a resident of Winnipeg for nearly 30 years.

Toronto's Building Record

The following comparative statement has been issued by City Architect McCallum, Toronto:

	1909.	1910.
Approximate value of buildings Jan. 1 to Nov. 30	$16,545,882	$19,774,518
Approximate value of buildings for the month of Nov.	1,940,650	2,040,030
Number of building permits issued Jan. 1 to Nov. 30	4,721	5,906
Number of buildings for which permits were issued for month of Nov.	650	722
Number of new buildings erected from Jan. 1 to Nov 30.	6,698	8,092

The Toronto Board of Control have voted an additional appropriation of $3,800 to the city engineer for the continuance of the chloride treatment of the city water. Since May 23 the department has spent about $5,000 in this work, with very beneficial results.

Contractors and Builders Supplies

Crushed Stone

For Concrete Fireproof Construction, Roadwork and Sidewalks

Rubble, Portland Cement

CRUSHED GRANITE for Floors and Sidewalks
SEWER PIPE WEEPING TILE
FIRE BRICK FIRE CLAY

Crescent Fire Brick

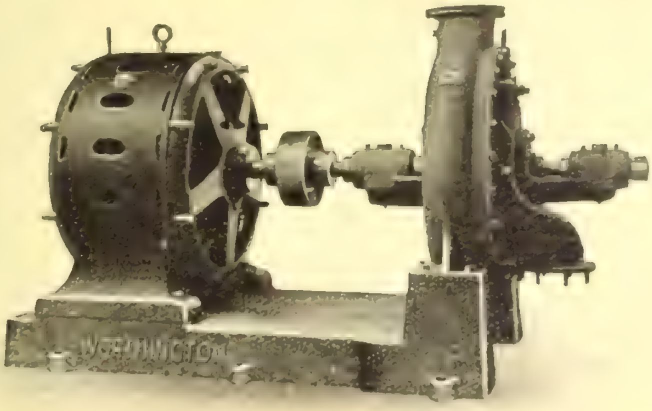
We are exclusive Distributing Agents for this high grade, hand-made fire brick. Large stock always on hand.

Don't forget our Prompt Delivery Service.

The Rogers Supply Co. - Toronto

Head Office: 28 King Street West Phone Main 4155

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER, WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

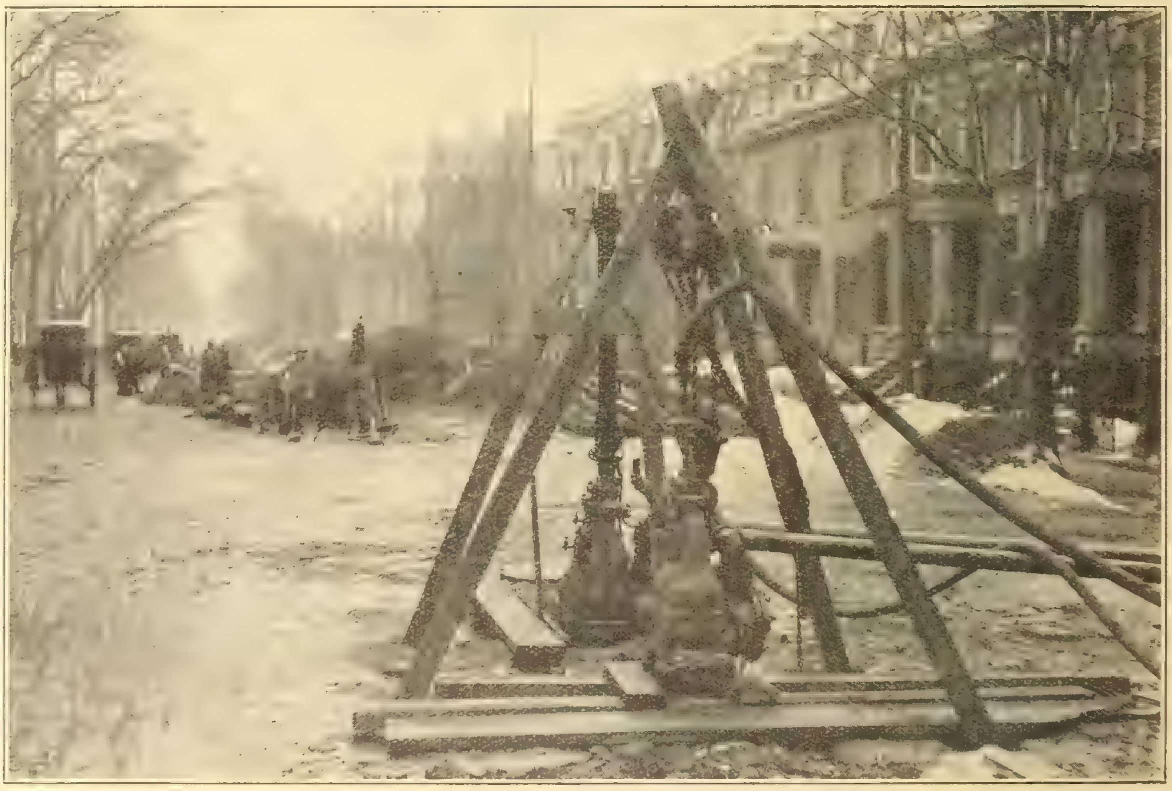
SEND FOR DESCRIPTIVE LITERATURE

WORKS 512 WILLIAM STREET MONTREAL

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
Limited

PULSOMETER

are the best pumps for quarries, trench work, and any work in which the pumping of dirty or gritty water is involved. No Pistons, rods or glands—Nothing to get out of order. No oiling required. Economical in steam consumption.



Two Pulsometers at Work on Sewer Contract, Sherbrooke St., Montreal.

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine

MUSSEN

TEAM PUMPS

Pulsometer Pump in a Quarry.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Crown Block.
Vancouver, Mercantile Bldg.

Glidden Liquid Rubber

A black elastic coating, especially intended for damp proofing basements and walls. Applied over brick or plastered surfaces. Durable and elastic under varying conditions of temperature.

Covers 150 square feet to gallon and upwards according to condition of surface.

Liquid Rubber Cement

Is especially intended for filling concrete expansion joints, producing a waterproof result.

It acts as a cushion under varying conditions of temperature. One pound of this material contains 23 cubic inches.

The Glidden Varnish Co.

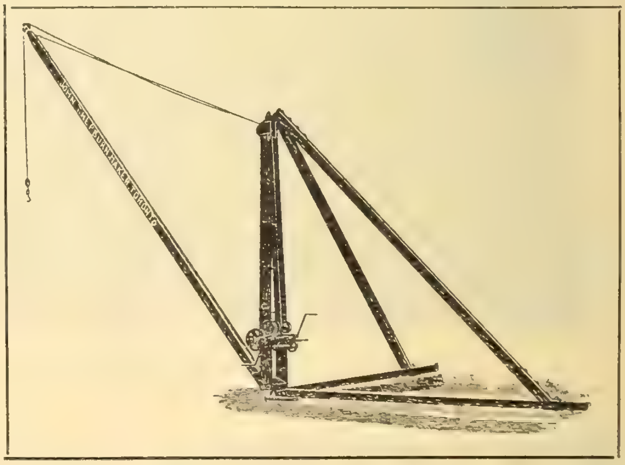
Branches and Warehouses
Atlanta Boston Chicago New York St. Louis

FACTORIES
Cleveland Toronto

Write for Booklet:—"Advanced Finishes for Modern Building Construction."

Wire Rope any size for all purposes

Every "Hepburn" Derrick, when it leaves our works, is equipped with an ample length of first quality wire rope.



But one Derrick will outlive many a rope. Our Wire Rope is

Strong, Flexible
and
Thoroughly Tested

When your old rope is worn, when you need wire rope of any size, in any quantity or for any purpose, you cannot do better than send direct to us for it.

Let us send you Quotations

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 December 14, 1910 No. 50

The Decimal Scale for Construction Work

It is generally conceded that the adoption of a single unit of measurement for engineering, architectural and construction work would not only facilitate the work of engineers, architects and contractors, but would also eliminate the chance of making errors in the transference from the engineers to the architect's scale, and vice versa, says Engineering-Contracting.

It is interesting to note the opinions of prominent men connected with engineering, designing and building operations. Mr. F. W. Reynolds, mill engineer and architect, Boston, Mass., says: "We believe that from the engineer's standpoint the decimal scale could be very well adopted for construction work. By this we mean that all measurements could be taken and expressed according to the decimal scale with quite as little trouble and confusion as follows the use of the scale of feet and inches. Drawings would be just as easily made and read if the decimal system was followed as under the present system. We fear, however, that unless the adoption of this system could be made compulsory, it would be the source of many errors from the confusion which would arise after drawings were sent out into the hands of persons more familiar with the scale of feet and inches than with the decimal system."

"The difficulty comes essentially from educating the contractor's foreman and men rather than the inspectors and engineering corps, as the latter are, of course, accustomed to the use of the engineer's decimal scale in all their surveying operations. I believe that in the majority of cases, more particularly large and important works, the use of the decimal scale would be possible, but greater difficulty would be encountered in its introduction in the smaller works. The fact must also not be overlooked that in such works as involve building—in iron work, castings, structural material, etc—the manufacturers and machine shops still adhere to the English "feet and inch" scale. Under such circumstances either separate plans for details would have to be used, or the two different scales would appear upon the same drawing, or dimensions would be stated for both purposes in one scale only. This again would be disadvantageous from the point of view of the mechanic, who has become thoroughly accustomed to the foot and inch scale, and in the majority of cases knows little of the engineer's decimal scale. You will see, therefore, that while from the engineer's point of view the change would, broadly speaking, be advantageous, from the practical point of view. I fear there would be serious difficulty in its general introduction, except perhaps in general classes of work."

The opinion of Mr. L. C. Wason, president of the Aberthaw Construction Company, Boston, Mass., is interesting as being that of a man intimately connected with actual conditions in the field. His opinion follows:

"In designing and figuring we work in the decimal system, later converting the measurements into feet, inches, and fractions to correspond with the dimensions given by engineers. If engineers and architects could be induced to use decimals it would be a great boon to the profession in general, and of assistance in the execution of work. I think co-operation could be obtained from the manufacturers of rules, who would make it more difficult to get rules divided in fractions of an inch, and turn out more of these in decimals, and also who would send out advertising literature showing the advantages of the decimal system. By the co-operation of the manufacturers and the engineers and architects, I believe a result could be accomplished which would be very desirable. I am looking forward with interest to the time when the metric system will become [illegible] through enactment of law."

PROGRESS OF CANADIAN TRADE.

Compilation of the returns of Canadian trade for the first six months of the current fiscal year, proves that the expectations of a record-breaking commerce were well-founded. Indeed, in some particulars, the event has exceeded the most sanguine expectation. Imports, exports and total trade all show large increases over the corresponding period of 1909, while in comparison with the same period of 1907, which heretofore held all trade records, imports show an increase of nearly 15 per cent. and total trade an increase of over 8 per cent. Exports are still slightly less than for the first six months of 1907.

Comparing the latest twelve months' period with the corresponding period of 1907, imports show an increase of 14 per cent, exports an increase of 12 per cent., and total trade an increase of 13 per cent. In all respects the twelve months ended September, 1910, was the greatest twelve months' period in the history of Canadian trade.

Methods and Cost of Paving at Guelph

Details of Various Construction in Tar Macadam, Asphalt Block, Westrumite and Brick Plant Required—Street Railway Track—General Observations

Specially Contributed by L. Malcolm, Acting City Engineer, Guelph, Ont.

The following description of work done in the city of Guelph, Ont., may be of interest to those engineers who have had limited experience in this connection and possibly the notes on street railway track work will be of aid. The account of our experiences in laying the tar macadam pavements may be helpful in view of the experimental work now being carried on with these materials in this country. So much by way of apology.

The paving of Guelph dates from 1907. It was in this year that the city became convinced, with reason, that the state of the streets was not good advertising, to say nothing of the inconvenience caused by muddy and rough roads. After much discussion and many visits of inspection, it was decided to pave the main street—Wyndham—(see accompanying sketch) with asphalt block on concrete. As no storm drainage had been put in, the first necessity was to make provision for the storm water. The contract for this was let in the fall of 1907. So that it was not until the spring of 1908 that any paving was done.

In 1908 the paving proper was commenced. The contract involved the laying of approximately 16,250 square yards of pavement, 3,400 feet of curbing, 2,000 lineal feet of car track, and such smaller work that is incidental.

In the same year the contract for approximately 5,600 square yards of asphalt block pavement on Carden street was let, but the work was not done until 1909. The specifications and contract were the same as for Wyndham street.

In 1909, two brick pavements were laid on Quebec street—east and west—involving about 6,000 yards.

On Woolwich street, about 14,000 yards of Westrumite was laid in accordance with their "A" specification. On this street 3,600 feet of car track was paved with vitrified brick.

The contract for 2,200 yards of Westrumite "A" was let for Paisley street, but on account of delays was held over until April of this year, 1910.

In 1910, Westrumite "A" was laid on Paisley street, and Westrumite "B" on Upper Norfolk street, 5,700 yards approximately.

Tar Macadam.—In 1908 the council decided that asphalt block was too expensive for residential streets, so an experiment was made on Douglas street with tar macadam. This seemed to give good results when completed, so that it was decided to do Cork street in the same way. This latter street was commenced in 1908 and finished in 1909.

In the spring of 1910, when the paving question again came up, it was decided to try tar-macadam and the city engineer, Mr. James Hutcheon, recommended same to council. It was computed that tar macadam would be as cheap as asphalt, even if the roadway had only five years of life to ten of asphalt, as it (the tar macadam) would cost less than half as much. This, of course, is speaking of surfacing only. In any case it was decided to use a concrete base. All the tar macadam in Guelph has been done by day labor. The accompanying sketch shows the areas paved (Fig. 1).

Curbs.—All the curbing is made of concrete and the most of it is laid combined with the gutter. In 1908, on Wyndham street, a 24 inch gutter was laid. This wide gutter is cheaper than pavement, and on a wide street it was thought that a 24 inch gutter would not look out of place.

In 1909 and 1910, the gutters on streets have been reduced to 12 inch, and with a little more slope to gutter so as to give a slightly more pronounced waterway. The streets are narrower and consequently the traffic comes nearer the curbing. A 24 inch gutter would likely come near the wheelway and the traffic along edge would break up the gutter and pavement rapidly. Also, 24 inch gutter would look out of proportion on the narrow streets, so the narrower gutter was adopted. On all

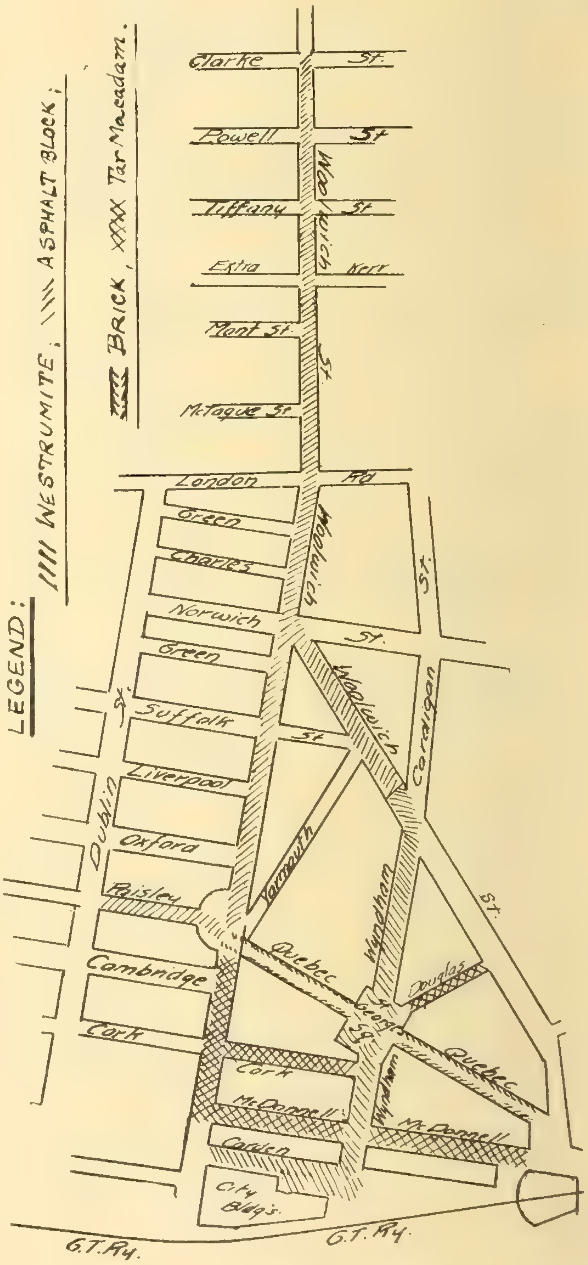


Fig. 1

bituminous pavements a gutter is employed, as is proper.

On the brick paving no gutter was used, a straight curb being employed. This was to keep the expansion joint as far out of sight as possible, i.e., next the curb.

The sewerage of Guelph is on the "separate" system, i.e., the storm water is carried in pipes separate from the house sewage. They discharge into the nearest watercourse. Storm drains are placed under all pavements.

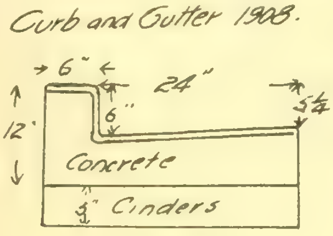


Fig. 2

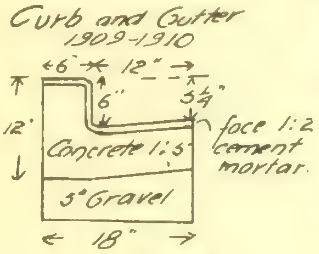


Fig. 3

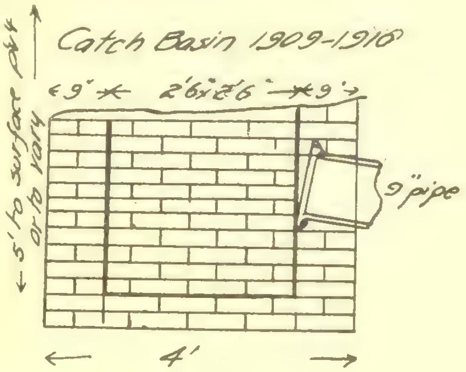


Fig. 4

The surface water is collected by catch basins (Fig. 4), and from these flows by 9 inch pipe to the storm sewer.

The street railway tracks are drained to the storm drain from track basins. Formerly these were made like the Detroit basins, of cast iron—long, shallow and narrow, and laid lengthwise across the track. The cover had circular holes to allow water to enter. These were not satisfactory as the holes rapidly clogged up with straw and dirt.

In 1909 we adopted a concrete track basin, walls 6 inches thick and dimensions 18 inches by 12 inches, set in the centre of the track with a cast iron cover, with bars leaving openings about 3 inches by 1 1-2 inch. These have given better satisfaction.

The basin is directly connected to the storm drain by 6 inch v.s.

Catch Basins.—The catch basins are built of good, hard brick, set in cement mortar and they are constructed in accordance with the plan given, Fig. 4. The tops are of cast iron and have a cast iron back to fit into and form part of the curb. They are cast from pattern in the city.

The catch basins are connected to the storm drain with 9 inch pipe, so as to render it impossible to have the water back up into basin and flood gutter.

The curbing is usually put in before the rest of the work is commenced. Some contractors prefer to take out part of the excavation along the sides of the roads before placing the curbs.

Crown. Rosewater's formula was used in a modified form.

$$c = \frac{W(100-4p)}{5000} \text{ was modified to}$$

$$c = \frac{100}{5000}W = \frac{1}{50}W \text{ since most streets flat,}$$

i.e., crown = 2 per cent. of the width.

W = width of road p = per cent of grade.

This is only a general rule, as we have had to vary the crown in a great number of cases on account of the two walks being at difference elevations.

The form of crown is the parabola.

Excavation.—When the curbing is set, the excavation is completed to sub-grade, being taken out roughly to the required depth and then "fine graded." This is done by placing stakes in the sub-grade and marking the correct position of the finished pavement on them. Then lines are stretched tightly between the stakes and longitudinally with the street. The street is then graded to the required depth below the lines. Excavation has been done by pick and shovel and wagon.

Concrete Base.—The concrete base for Wyndham street, 1908, and Carden street, 1909, was composed of gravel concrete, 1 part Portland cement to 9 parts gravel.

In 1909 the proportions for the base were changed to 1 part Portland cement to 6 parts of aggregate, consisting of 40 per cent. broken stone, size 1 1-2 inch, and the remainder of gravel. On account of the difficulties of inspection in getting the proper amount of stone, and because results were not better than with gravel, in 1910 the proportions were made 1 part Portland cement to 6 parts of approved gravel.

The method of laying the concrete is to set pegs in the roadway and drive them in the sub-grade until their tops will be at the finished top of the concrete. The concrete is then placed on the roadway and finished flush with the tops of the pegs. The pegs are set in the sub-grade by offsets from a string stretched between the tops of the curbs or set by boning rods used between tops of curbs.

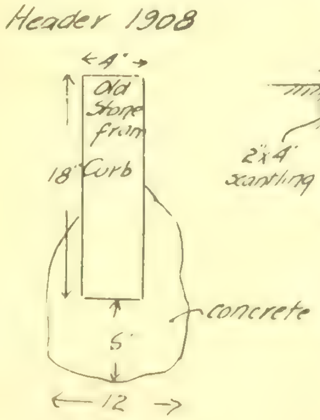


Fig. 5

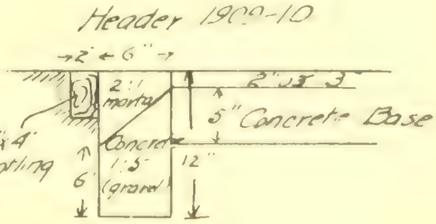


Fig. 6

The writer does not believe in setting the pegs for either excavation or concrete with an instrument, except possibly, for a badly warped street intersection. He has put in some intersections that were extremely difficult by boning from curb to curb and setting the stakes by cuts figured in the office, and the results, both as to time saved and appearance, justify the above statement.

Headers.—Headers placed in 1908 were made of the old limestone curbs set in concrete. See Fig. 5.

This was changed in 1909 to one of concrete (Fig. 6) made part of the pavement base. The header has a 2 inch x 4 inch scantling placed in front to withstand the wear for the first year.

Surfacing.—The surfacing that has been employed consists of asphalt block, vitrified brick, Westrumite (both "A" and "B" specifications) and tar macadam. Fig. 7 shows sections of paving. In all pavements it is customary where a concrete gutter is employed to keep the surface of paving from one-quarter inch to three-eights inch above the gutter to allow for wear.

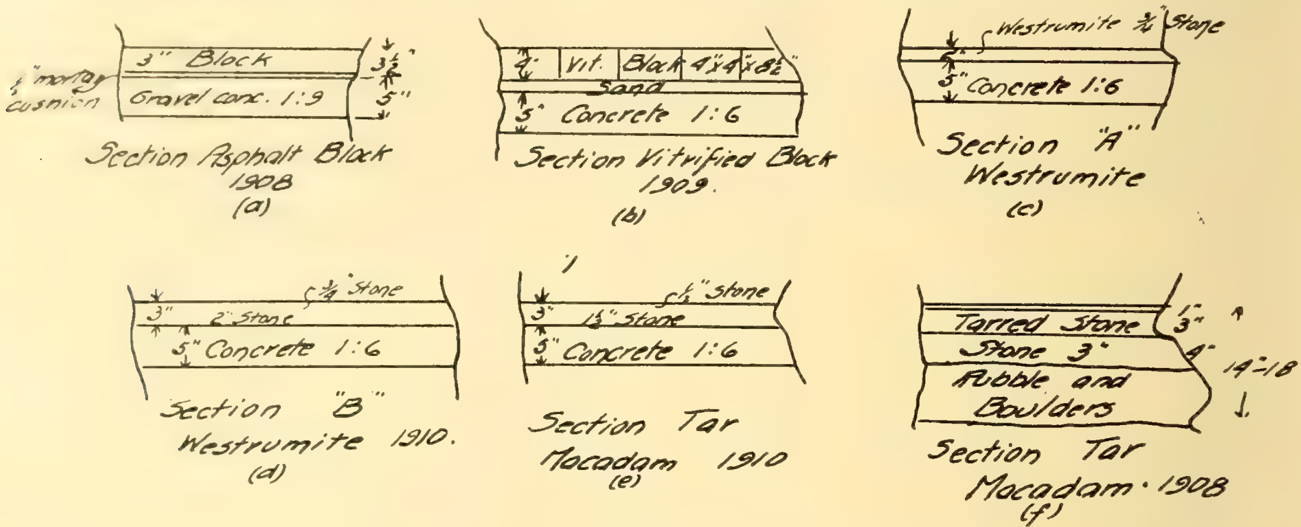


Fig. 7

Asphalt Block.—This block was made by the Ontario Asphalt Block Company, and is 3 inches by 5 inches by 12 inches. They were laid on their "flats" as follows.

On top of the concrete was spread the mortar cushion, consisting of 4 parts of sand to 1 part Portland cement. This was made just moist (If the mortar is wet and sloppy the brick will tilt when rolled). The cusion was then spread over the concrete. It was drawn off to an approximate thickness of one-half inch by a straight-edge, which acted on strips laid on concrete at right angles to street.

The strips were taken out and their place filled with the mortar, drawn off by a hand lute. The blocks were then laid by men standing on the block already in place and were placed three rows at a time across the street. When the day's work was completed, they were rolled, all loose block and block with an uneven cushion were removed and replaced, and the whole then thoroughly wetter.

The joints were filled by cement grout. This was made of fine sand, 2 parts, and 1 part of Portland cement, mixed with water to the consistency of thin cream. The brick were wetted with water and then the "filler" applied and swept into the joints. It was found on one street, where the grout was poured on the bricks when dry, that the joints were not properly filled. A thin film formed over the joint and prevented any grout getting between the bricks. This grouting had to be done three times before satisfactory.

Brick Pavement.—This was laid in the manner recommended by the National Brick Manufacturers' Association, expansion joints being placed along the curb and every 50 feet in length of the street. These joints were made of bitumen and were one-half inch to three-quarter inch in width. They have given satisfactory results so far. The cushion for the brick was of 1 1-2 inch sand and the joints were filled with cement grout, Portland cement 1 part, sand two parts.

Westrumite.—This material is an asphalt macadam. "A" specification is as follows: three-quarter inch stone is mixed with a certain proportion of stone dust, water, and Westrumite asphalt composition. Mixed thoroughly in a concrete mixer, it is placed on street, raked to required thickness (allowing for compression) and then rolled. A flush coat of stone dust and Westrumite asphalt with water is then applied and swept over the surface of street. Then a layer of sand is placed over the top and the whole pavement is rolled. The thickness used in the "A" specification is 2 inches.

In 1910, Norfolk street (Quebec to Woolwich street) was paved with Westrumite, "B" specification. This provides for a wearing surface of 3 inches and is made up as follows. A layer of 2 1-2 inch stone was coated with the asphalt composition laid on the street, and then covered with about 1 1-2 inch or 3-4 inch stones mixed with stone dust. This was raked evenly over the lower course, allowed to stand for about half a day to dry somewhat, and then rolled so that the finer stone was forced into the voids of the larger. After rolling, a flush coat or sealing coat was applied as for the "A" specification. It is necessary with Westrumite, or at least the company thinks so, to have it stand for one week to two weeks after completion, before opening to traffic.

Tar Macadam.—As far as the writer has been able to ascertain, the method adopted for Douglas and Cork streets was as follows: After the curbs were constructed the street was excavated to about 18 inches below surface of finished pavement. Then a layer of boulders and rough rubble was placed. All projections were knocked off and the whole then well rolled. On top of this a layer of coarse broken stone (2 1-2 inches) was placed and well rolled. This was sprayed with tar to bond with the top. On this was placed a layer of 1 inch stone well tarred, with a mixture of tar to which had been added a proportion of cement. This layer was well rolled. On top of this was placed a layer of tarred chips, one-half inch in size. This was well rolled also. The surface was then flushed with hot tar by means of brushes dipped in it. On top was placed a layer of sand. The tarred stone was left to stand a month or six weeks after mixing and before placing on the road, to mature.

Personally, the writer does not think there was any necessity for the coarse stone foundation, as the sub-grade was of gravel and required no drainage, nor was there any danger of the sub-grade not carrying the road. The better and cheaper way would have been to use only broken stone on the sub-grade and roll the sub-grade and first course thoroughly.

Upon the recommendation of the engineer's department, in the spring of 1910, the base for Norfolk and McDonnell streets was let by contract and the surfacing done by day labor.

The method was based on that of "tar grouting" the stone. After the base was completed it was allowed to dry for about two weeks. Then hot tar was spread over the surface and broomed to as thin a coat as was possible. About 2 1-2 to 3 inches of broken stone was then spread over the tarred concrete and rolled.

The remainder of the work was tried as follows:

I. This broken stone was rolled into place, then the tar was poured over it by means of coal scuttles until the whole seemed tarred. Then was placed a layer of hot screenings of one-half inch size. This was rolled and another application of tar made by the use of watering cans. Then was applied a layer of sand, rolled in. This method was found not to answer because (1) when the loose stone was rolled the surface stone could be forced into the large stones; (2) the roller crushed the first layer of one-half inch stone and the tar could not then penetrate to all parts, and we did not get an even mix; (3) with the use of coal scuttles, too much tar got into the pavement and as the base was concrete the tar ran to the gutters; (4) the road did not look like a "tar macadam" as it was white. This white color aroused some adverse comment, so it was decided to change the method.

II. After the first course of stone was added, the stone was run over by the roller once, to partially bring it to position. Then it was tarred and a layer of one-half inch stone was heated and placed on the road. This was immediately sprinkled with tar and then rolled. The next day this was coated with tar applied by brooms. And then a layer of sand was added. This was found satisfactory, but it did not give promise of making much headway.

III. EXPERIMENT.—After the stone was placed, the roadway was only rolled once. Then a layer of one-half inch stone was heated and tarred by hand-mixing, and placed on the road. This was well rolled into the roadway and a "surface sealing" coat was then applied by brooming hot tar over the surface. Finally, a layer of sand was placed over the street. This gave good results both as to the road and as to rapidity. Also less tar was used, so this method was adopted.

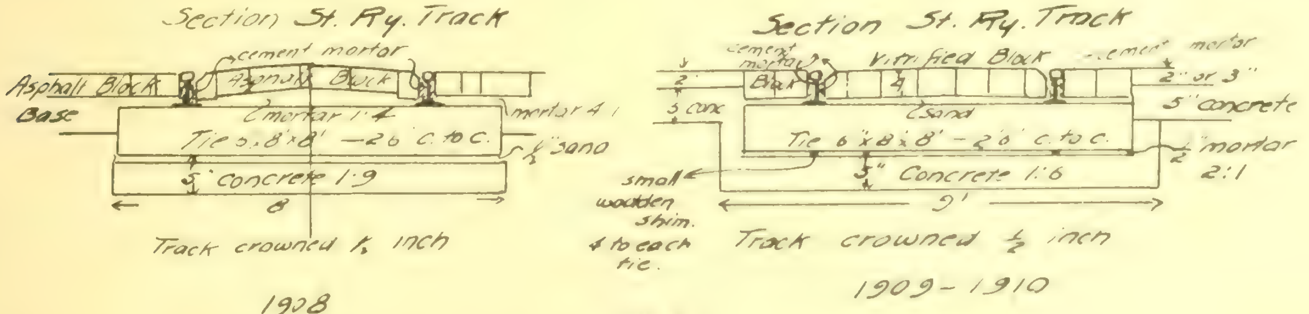


Fig. 8

Plant.

(For general layout of plant in yard, see Fig. 10.)

(1) BOILER. The boiler was an old steam tubular boiler. It was bricked in and a platform built at one side. The barrels were brought from the gas works by truck and rolled on to the platform. Then the tar was run into the boiler—one-half barrel at a time until about four or four and one half barrels were in. This was boiled until the mixture attained a certain consistency. This was determined by rule of thumb methods rather than by any standard test. It was done by dropping some of the tar into water and then noting whether it would draw out into threads when placed between thumb and forefinger. When sufficiently boiled it was run out by the outlet pipe into tank and hauled to the work (Fig. 10).

(2) TANK. The tank employed was built of Norway pine. After about two days the wood had shrunk badly, so that the tank leaked so much that it looked like a sieve. It was then lined with galvanized iron, soldered and rivetted. This was fine—for about half a day, at the end of which time the solder had all melted off. It was resoldered and refixed, but did not give satisfaction. As it was impossible to obtain another tank at the time, we were compelled to use the leaking one to keep the work going. After about two days' use with the tank leaking, we were surprised to note that the leaks stopped, and we had no more trouble with it far the remainder of the summer.

(3) MIXING BOARD. The mixing board for mixing the stone and tar for the surface was built of 1 inch lumber in the same manner as a concrete mixing board. The stone was then dried thoroughly, and, with dust screened out, was placed on the board. Tar was poured on it while the stone and tar were mixed by men with shovels. This mixed stone was immediately placed on the roadway and raked off to a thickness of about three-quarter inch to one inch. It was then rolled in thoroughly. The board was placed on the road immediately in front of the surface being treated, so that the tarred stone was readily shovelled off the board to the position required. The board was moved forward as necessary.

(4) The plant for drying was of the simplest. An excavation in the boulevard was made and covered with one-quarter inch sheet iron. The stone was placed on this and heated, until dry, by fire beneath the plates. When the weather was warm, the one-half inch stone was spread over the concrete and dried by the sun. This we were able to do for the greater part of the time. When dry, the stone was screened to remove the dust.

(5) The roller employed was twelve tons in weight and of the size and kind usually employed for macadam roadwork. The tar employed was at first obtained from the gas works. The boiling that was given was necessary to removed the water and lighter oils. This tar was used also in 1908-1909. It has given entire satisfaction.

When the work was about half completed, this supply gave out and we had to use Tarvia X. Part of this was obtained in tank cars which were heated by steam. Part was obtained in barrels. The latter was the more satisfactory method, as the tar could be heated to a higher temperature and consequently we got a better penetration when grouting the lower course of stone.

Observations.

(1) Tar must be hot. This ensures better penetration, for with tar on cold surface [illegible] get in sufficiently between stones

(2) Dust must be removed. Dust prevents tar from penetrating the pavement. A better mixture is obtained for surface when dust is removed.

(3) Allow roadway to set. We had to keep traffic off surface for some four or five days after completion.

(4) Too much tar is detrimental with concrete base, as it runs in warm weather.

(5) A great deal of room is left for standardization of tar. This seems to be the weak point.

(6) Do not roll bottom course too much, as it prevents the surface stone from being forced into the space between larger stones. The secret of any pavement lies in its density.

(7) A tank should be made of steel (rivetted) to give satisfaction.

Street Railway Track.

The street railway track has offered somewhat of a problem. There was, and is, only a twenty minute service and not any likelihood of any more traffic for some years, so that there was no necessity for a double track. To make it possible to double track later on Wyndham street the track was laid in its proper position, i.e., the centre line was placed about 4 feet 6 inches to the east of the centre line of street. At the square called St. George's Square, the track runs around a fountain and a small park. The old track was laid with old 56 pound steel rails, about 12 feet long. This had to be renewed and was relaid with 60 pound steel. The remainder of the track was laid with old 60 pound steel. The old angle bars, with two bolts to each rail, were used. The track was firmly spiken in place to ties 2 feet 6 inches centre to centre. The whole track was then placed on this and then brought to line and lifted to grade by packing sand in under the ties by shovels and tamping bars. See Fig. 8. When this was done concrete was placed between these ties and flush with their tops, and firmly tamped to surround each tie.

Tar Boiling Plant 1910

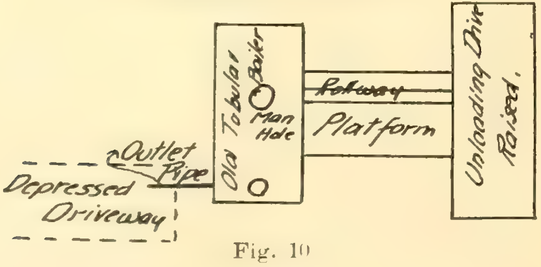


Fig. 10

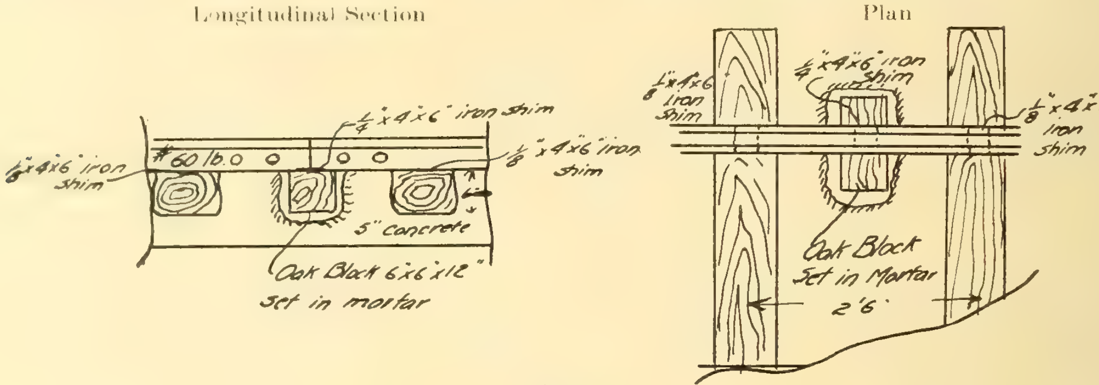
The rails were laid with broken joints and the joints suspended, the concrete being firmly packed under the joints.

The joints have since given out, due largely to the following causes: (1) old joints uneven and the consequent knife-edging of the rail ends caused a rapid disintegration of the concrete. (2) The old angle bars did not give sufficient support. This has been remedied for the present, after a number of experiments, as follows:

(1) Placed new plate under the rail ends and packed with concrete. Kept traffic off for three or four days. Not successful, as concrete rapidly pulverized.

(2) Cut out concrete, placed oak block and placed iron plate over the top, and packed with cement mortar. Not successful, blocks soon worked loose.

(3) Placed oak block under tie and tightly against rail. Packed with mortar, 2 to 1, and kept traffic off until set. Then a one-quarter inch steel plate 6 inches by 4 inches was driven in under rail and a one-eighth inch plate under each adjoining tie. This tends to raise rails at joint, but also to take out any bending caused by traffic. (The rails are old ones.) It also eliminates to some extent the effect of brooming. Also there is a certain amount of settlement of the steel plate into the tie which will gradually tend to eliminate the greater height at the joints. See Fig. 9. This was placed last June and seems to have given satisfactory results to date.


Longitudinal Section

Plan

Fig. 9

In the work last year, 1909, the same street railway construction was followed as in 1908 to a great extent. The method of construction was amended by bringing the ties to grade by inserting small wooden shims under them—four to a tie. These were driven in tightly until the rails were to grade. The space under the ties was then filled with cement mortar, mixed 2 to 1, which was forced under the ties by tamping bars. The broomed ends of the rails were cut off by a jig saw, so as to make an even joint. This caused considerable extra labor and expense, both by cutting of rails and also by extra drilling of one hole at each end of rails and extra cost of taking rails to and from saw. It was thought that the extra cost would be overbalanced by consequent lasting of the joints. This is has done to a great extent, but there are two or three joints already in need of repairs and in consequence the method adopted this year is to place a tie under each joint and place a 6 inch by 4 inch steel plate one-quarter inch thick in order to eliminate, as far as possible, any play that may occur.

In 1909 the street railway track on Carden street was laid with new 80 pound A.S.C.E. steel, with angle bars at joints. There has been no trouble at all with this portion of track. Not one joint shows any sign of breaking down.

WITH ASPHALT BLOCK. The asphalt block was continued to the rails on the outside of track. The first brick was laid longitudinally, and the others then at right angles to street. The space between the block and rail is filled with cement mortar, 2 to 1.

BETWEEN RAILS. Block was laid as follows: A champfered vitrified block was laid just within the rail, leaving a space 1 1-2 inches wide by 1 1-2 inches deep for flange of rails. The asphalt blocks were then placed between these.

The surface was crowned one-half inch between rails. The blocks were set on cushion of cement mortar 4 to 1. When the blocks were in place, cement mortar, 2 to 1, was placed between the vitrified block and rail to form bottom of flangeway. The joints were filled in the same manner as for the rest of pavement. To give good results, street car traffic should be kept off the pavement for at least five days.

The surface adopted for 1909 and 1910 is vitrified brick, on a sand cushion. The vitrified brick are laid at right angles to street both inside and outside the rail, except that the champfered brick is laid longitudinally. The flangeway is formed as for the 1908 work, except that it is made 1 3-4 inches wide and 1 3-4 inches deep to accommodate the new types of freight car wheels.

The joints are filled as for brick paving and a 2 to 1 cement mortar is placed under rail heads, i.e., between rails and brick.

Costs.

(Mainly contract prices except that of tar macadam.)

1908.	Asphalt Block. Wyndham street.	
	Per square yard, including base	$2.52
	Gutter, per foot	.63
	Walk, per square foot	...
	Header, per linear foot	.30
	Track basin, each	.12
	Street railway track cost 15 per cent.	
	Catch basins, complete with cover.	
	Tar macadam, total cost, $1.66. City crushed our stone.	
1909—	Tar macadam finished from 1908	$1.62
	CARDEN ST.—	
	Asphalt block same as Wyndham street.	
	WOOLWICH ST.	
	Brick car track and Westrumite paving.	
	Conrete curb and gutter, straight	$0.54
	Concrete curb and gutter, circular	.56
	Pavement, Westrumite per square yard complete, including base and excavation	1.98
	Street railway track, per square yard	2.80
	Catch basins	30.00
	9 inch sewer, per foot	12.00
	Headers, per foot	.50
	QUEBEC ST.—Brick.	
	Concrete curb, straight	.33
	Pavement, including base and excavation, per square yard	1.98
	Catch basins (without cover)	15.00
	9 inch sewer, per foot	.47
	Headers, per foot	.50
1910—	Paisley St., from 1909, same as Woolwich str	
	Norfolk street and McDonnell street	
	Concrete base, etc.	
	8 in. excavation and concrete foundation	$0.64
	Curb, 6 x 12 inch gutter, straight	.39
	Curb, 6 x 12 inch gutter, circular	.42
	Headers, per lineal foot	.25
	Concrete walk, per square foot	.09½
	Catch basins (without cover)	18.00
	9 inch sewer, per lineal foot	.50
	NORFOLK ST. (UPPER). Westrumite.	
	Concrete foundation and excavation, per square yard	$0.63
	Curb, 6 foot x 12 inch gutter straight, per foot	.38
	Curb, 6 foot x 12 inch gutter, circular, per foot	.42
	Headers, per foot	.40
	Catch basins (without cover)	21.50
	Street railway track, per foot	2.25
	Concrete walk, per square foot	.12
	9 inch pipe per foot	.45
	3 inch "B" Westrumite surfacing, per square yard	1.35

NORFOLK ST. and McDONNELL ST.

Square yards. Total yards, 13645.7.

	Total.	Per sq. yd.
Total wages, including haulage, rolling, help in office, foremanship	$2576.31	$18.15
Tar	2734.68	20.04
Coal	137.01	1.004
Plant, including wages on plant	284.69	2.09
Stone, estimated at		0.14
Total		$55.32

This latter does not take into account a supply of larger stone left on hand which can be used for repair of roads.

The city crushed all the stone used. This is estimated at $1.50 per cubic yard, in the city yard. This is somewhat high. The cost of delivering stone for one-half mile of haul is included in the wages.

The plant also is in good shape and may be used for future work. No account is taken of the present value of this plant.

A reinforced concrete well lining, 46 feet deep and 3 feet 7.3 inches in inside diameter, was recently sunk in Munich as a monolith. The concrete, it is stated in "Beton and Eisen," was 6.88 inches thick, except for the lowest 3.28 feet, in which the thickness was gradually increased to 8.8 inches at the base. The cutting ring was made of oak timber 4 inches thick and the same size as the bottom of the concrete. The reinforcement consisted of five vertical channels in the centre of the concrete, banded with rings of ¼ x 2⅜ inch bars placed at intervals of 4 feet 11 inches and bolted to the channels. This iron frame was put together exactly above the well site and the concrete molded around it in layers 3 feet 3 inches high. The cylinder was then lowered by excavating the soil below it. As each succeeding lift of concrete was added more earth was excavated. The entire operation consumed 160 working days.

George H. Webster, of Vancouver, has been awarded the contract for the Dewdney dyke at Matsie Slough. The work will be completed at once as the contract calls for its completion by March 1 next. The dyke, which will reclaim a large area of rich land flooded annually by the Fraser river, will be six or seven miles in length and will cost about $80,000. The dyking commissioners who will have the work in hand are Messrs. Kenworthy, Shook and Tupper, Mr Douglas being secretary. Mr C. E. Cartwright, of Vancouver, is engineer for the commissioners.

Surveying has been commenced in connection with the project of the Canadian Collieries for the development of a 50,000 horse power on the Partridge river in the centre of the Comox coal fields, British Columbia. The proposed improvements will cost $[illegible]

Satisfactory Methods of Underdrainage

Laying out a Field for a Drainage Survey—Taking the Levels—Construction of Drains — Advice to the Clay Tile Industry

Specially Contributed by W. H. Day, Department of Physics, O.A.C., Guelph, Ont.

Underdrainage in Ontario has doubled in extent during the past five years, the amount done in 1909 being approximately 58,000 acres, as compared with 30,000 in 1905. The character of the work has undergone a similar transformation. Formerly it was done in small jobs of 10, 15 or 20 acres per annum, requiring one, two or three miles of drains; now it is being done in large blocks of 50, 100 or 200 acres, requiring 5, 10 or 20 miles of drains. In one case I know of 22 miles, on one man's farm. Operations on this scale have developed two great needs:

(1) The systematic drainage of a large area requires a minute topographical survey thereof, level readings every 100 feet square, with occasional readings between in case of prominent features, such as knolls and basins. From this survey a contour map can be made, the drains located thereon, the grades determined and the cut of the main fixed so as to give effective drainage to every portion of the block surveyed. Without such a survey it would be impossible in many cases to tell how deep the main should be in order to drain the depressions farther back.

(2) The individual ditcher, with his spade, capable of digging only in the spring and fall when the ground is soft, and very slowly at the best, must give place to more rapid methods than can be used from early spring until the ground freezes in the autumn. Such methods are indispensable if the people are to construct anything like the quantity of drains they are planning. These two phases of modern drainage will be discussed in this article.

Laying Out a Field for a Drainage Survey.

Experience has shown that, in most cases, convenience in mapping and determining grades demands readings every 100 feet square. To obtain these it is not necessary to stake the field entirely, but only to set two rows across it each way, or possibly four if the length is too great for the stakes to be distinguished with the naked eye half way across, the rows of each pair and the stakes in them being 100 feet apart. Figure 1 illustrates the method. In most cases it is found wise to set the rows parallel with two fences, end and side, respectively, as the permanent fences constitute the farmer's starting point for all operations. The fences most suitable for base lines, the probable outlet, and any peculiarities that exist are noted as the owner conducts the surveyor over the area previous to the commencement of the survey work. No attempt need be made to stake out the area permanently, for in few cases will the draining be done immediately, and permanent stakes through the fields would be in the way in the meantime. But enough permanent stakes should be set along the fences to enable the farmer to put up the rows again, if necessary, to locate the drains. As a matter of fact, however, the drains are nearly always located by the fences.

Taking the Levels.

When the staking has been done as indicated, the staffman, by sighting himself in line with two stakes, north and south, and at the same time in line with two east and west, can place himself at stations 100 feet apart each way all over the field. The level is set up at L., and as the staffman proceeds along course O readings are taken at the various stations within the range of the instrument. The staffman returns along course I, readings being taken as he does so. This operation is continued until all stations within the range of the instrument have been read. A convenient station in the last course is chosen as turning point, and the level moved to L_2; and so on until readings have been taken all over the area requiring drainage.

No attempt is made to refer the readings to sea-level. An arbitrary datum is chosen 10, 20 or 30 feet or more below the surface at station O, course O. The elevations should be calculated in the field while the staffman moves from station to station, as there is plenty of time. And besides knowing the elevations as one proceeds aids in gaining some idea of what the system of drains will be, which in turn helps to decide what levels are necessary in dealing with prominent features, or in determining the outlet.

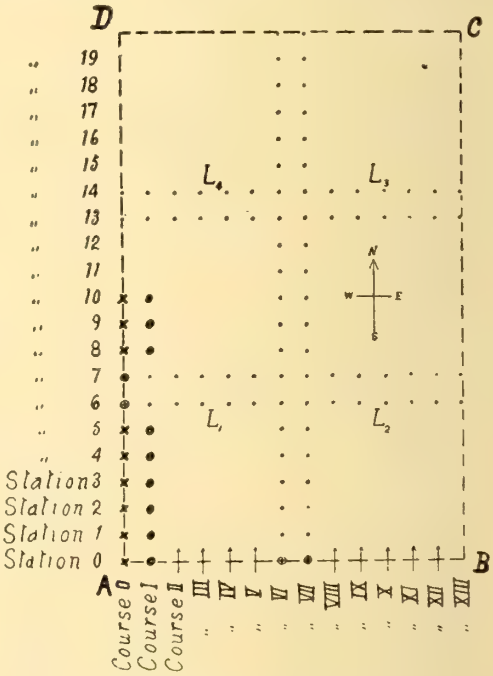


Fig. 1—A Field laid out for Drainage Surveying

Making the Map.

In making maps for farmers it is necessary to provide something simple and at the same time complete in itself. These considerations have shown it wise to put all maps on cross section paper on a scale of 1 inch equals 100 feet, accompanied by a key explaining every symbol appearing on the map. The paper being laid out in squares, the farmer at once sees that the heavy division lines represent the courses along which he as staffman (it is wise to have the owner carry the staff, if possible) travelled during the survey. This at once gives him something tangible upon which to build his interpretation of the map (a blue-print would not serve near-

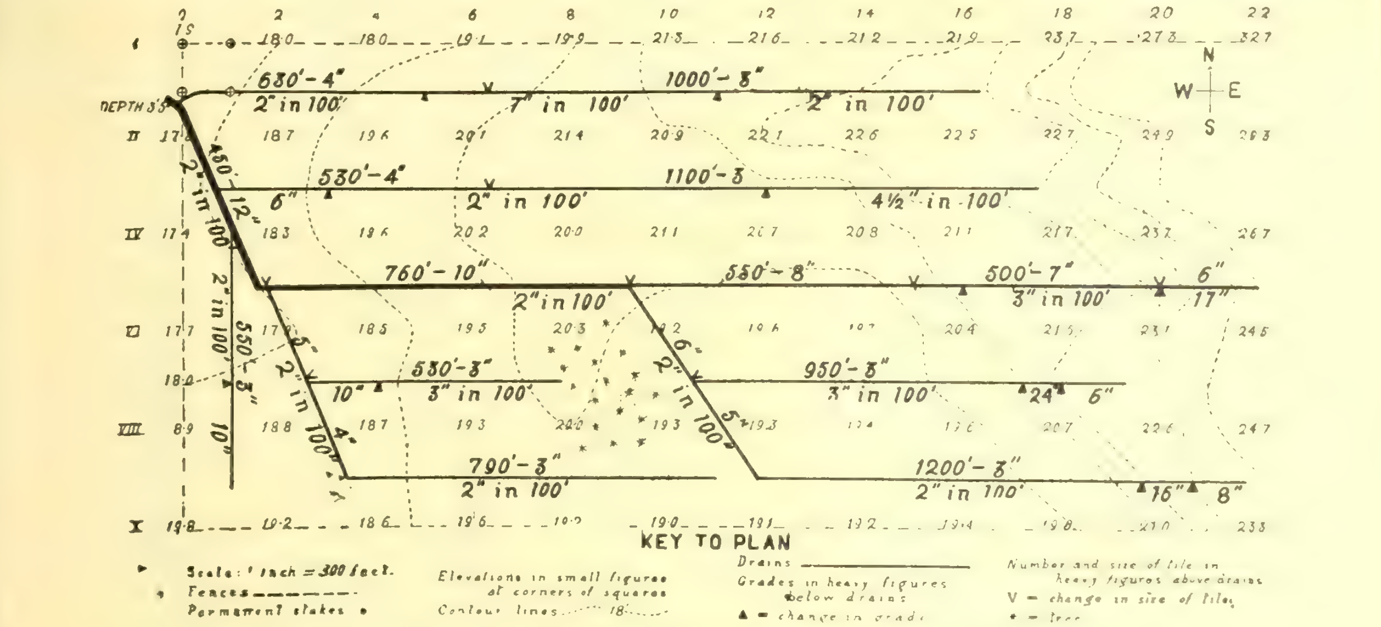


Fig 2—Plan of drains, showing location of drains, depth at outlet, size of tile, grades, etc.

ly as well). By this time his eye has caught the "key," he begins to study—and experience has shown that not more than one in a hundred fails to understand the map sufficiently to put in his drains according to it. A few come back for some further explanations.

Figure 2 shows a plan of drains taken from one originally made for a farmer, but for clearness of reproduction three-fourths of the elevations and two-thirds of the drains have been left out. The scale was modified to correspond with the reduced size; and the lines of the cross section paper failed to show in the reproduction. The details of preparing this may need not be entered into, as the readers of the "Contract Record" are familiar with such work. Suffice it to say that the main drains are run in the lowest ground, as far as possible, and the laterals at right angles to the contours as nearly as may be. At the same time it is wise to adopt a system that gives long drains rather than short ones, as there will be fewer junctions, unless such a system is distinctly inferior in some other way. In determining the grades and depths of the main it is necessary to select the hardest spot in the whole area to drain, i.e., the "low spot" farthest from the outlet, and make a profile from there to the outlet, using the minimum depth in the low spot, getting as steep a grade as possible, and yet striving to avoid too deep digging. When the depths of the main are known, the grades of the laterals may be determined. When the grades and the area to be drained are known the sizes of the tile may be decided on.

Size of Tile.

To aid in determining size of tile there is perhaps nothing more helpful than McConnell's table, given below. I have been unable to learn what formla was used in preparing this table, or to find the co-efficient of friction for clay tile, but using Fanning's formula for smooth brick-lined conduits six inches or over in diameter and a maximum rainfall of two inches in 24 hours, of which one-half inch runs off and three-quarter inch is absorbed by soil, leaving three-quarter inch to be carried by drains, I have found that the large sizes of tile on the grades mentioned would carry off the drainage water from areas indicated in approximately two days. As this is considered fast enough to avoid serious injury to crops, we have adopted this table as a guide in determining the size of tile to use.

TABLE I —SIZE OF TILE PIPE OF MAIN DRAIN

(McConnell.)

Fall.	Acres Drained.					
	3-inch tile.	4-inch tile.	6-inch tile	8-inch tile.	10-inch tile.	12-inch tile.
1 foot in 20	18.6	26.8	74.4	150.0	270.0	426.0
1 " 30	15.1	21.8	60.4	128.0	220.8	346.0
1 " 40	12.9	18.6	51.6	108.8	189.6	298.4
1 " 50	11.9	17.0	47.7	98.0	170.4	269.0
1 " 60	10 9	15.6	43.4	90.0	156.0	246.0
1 " 70	10.0	14.5	39.9	83.0	144.4	228.1
1 " 80	9.3	13.4	37.2	77.0	135.0	213.0
1 " 90	8.1	12.6	35.0	72.5	127.0	200.5
1 " 100	7.3	11.9	33.1	69.2	120.6	190.5
1 " 150	6.7	9.5	26.6	56.0	97.3	154.4
1 " 200	5.7	8.2	22 8	48.0	83.9	[illegible]
1 " 250	5.1	7.5	20.4	42.4	74.4	117.0
1 " 300	4.6	6.9	18.4	38 2	65.5	107.0
1 " 400	4.1	5.9	16.5	32.6	60.3	90.7
1 " 500	3.7	5.2	14.8	30.1	54.0	81 6
1 " 600	3.3	4.7	13.3	28.0	48.6	[illegible]
1 800	2.9	4.1	11.4	24 0	41.9	65.0
1 1,000	2.6	3 7	10.2	21.2	37.2	56.0
1 " 1,500	2.1	3.0	8.5	16.8	30 8	47.0
1 " 2,000	1.9	2.8	7.4	15.0	25.0	40.8

Depth and Distance Apart.

The depth of drains and the distance apart are related questions, and one cannot be intelligently discussed without consideration of the other. We may lay it down as a fundamental law that the drains should be deep enough to permit the fullest root development of which the plants are capable, and which they demand for best results. The roots of many farm crops penetrate from two to four feet deep. Now, for some time in the spring, the water-table in a drained field is in a zig-zag form like a rail fence, low at the drains and high between. In a clay in fairly good conditions this slope is about 1 foot in 15, in loam 1 foot in about 33. Applying these gradients, we see that for depths of 3 to 3 1-2 feet drains placed from 50 to 66 feet apart in clay and from 66 to 100 in loam will give approximately two feet of drained soil half way between the drains, which cor-

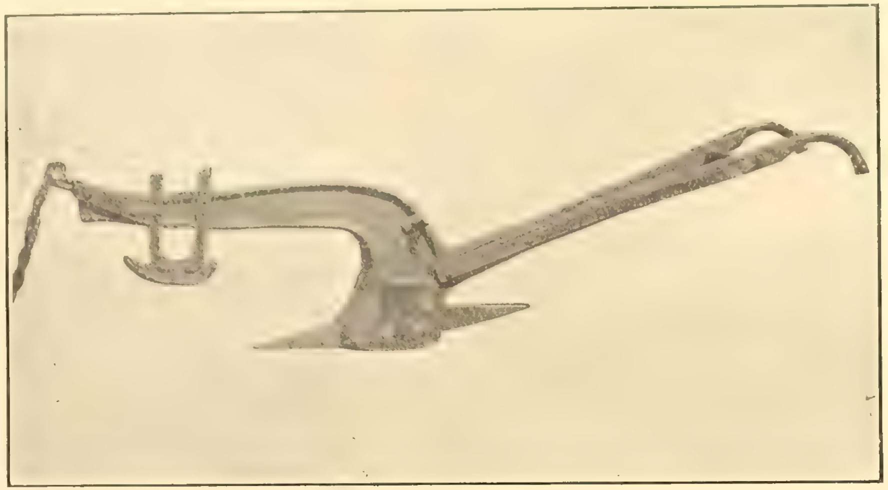


Fig. 3—The Pick Plough

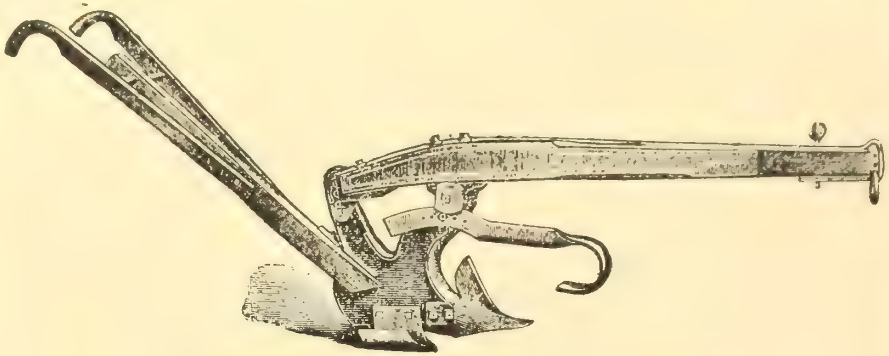


Fig. 4—Ditching Plough

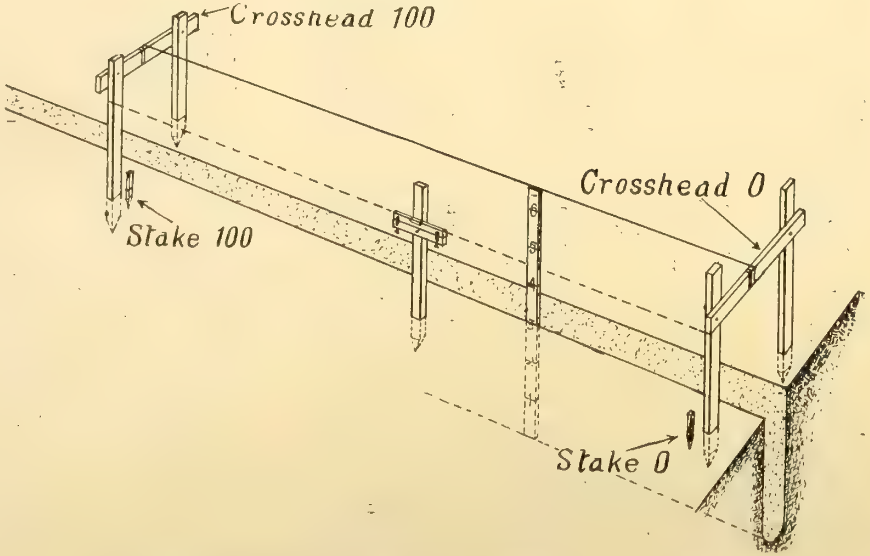


Fig. 5—Overhead Line Method of Grading a Ditch Bottom

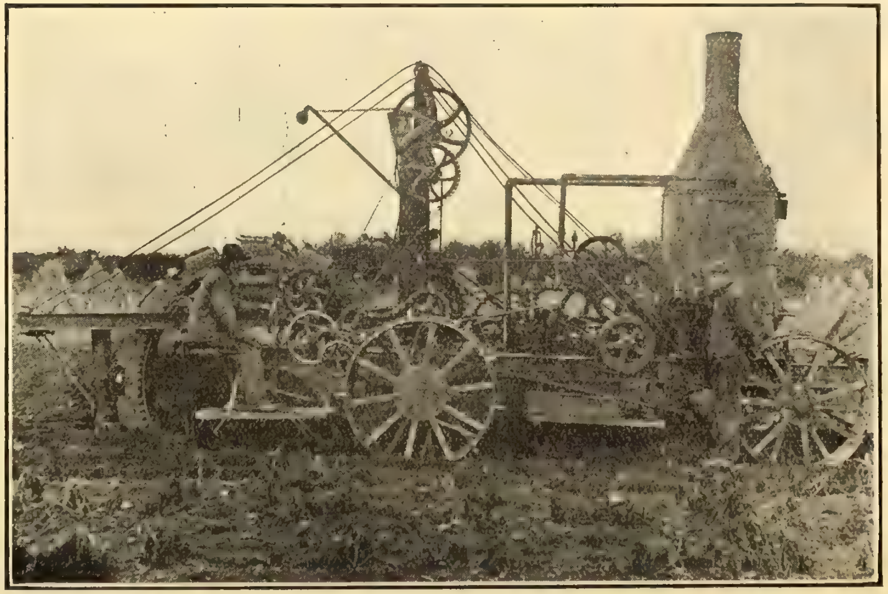


Fig. 6—Traction Ditcher Cutting a Trench

responds with minimum depth desirable for roots of plants. Hence we may conclude that these depths and distances apart represent in a general way what should be aimed at in laying out a system of tile drains, though at the same time we must recognize that no cast iron rule can be laid down as soils vary so much.

Construction of Drains.

In extensive drainage operations the trenches must be cut either by a large gang of men or by ditching machines. In the former method the play can be used to good advantage. The ditch may be opened up with an ordinary plow, and two more furrows at once cut in the bottom. These are shovelled out. A long doubletree is used so one horse can walk on each side of the trench, and a chain six or eight feet long from the double-tree to the ploy allows the latter to go down in the trench. When the common ploy can no longer be used for loosening, a heavy pick plow (fig. 3) or a ditching plow (fig. 4) may be substituted. These may be used till the drain is almost full depth. There are many methods of grading a ditch by hand, but the overhead line is probably the best. Fig. 5 shows the method. The line is given the same slant as the ditch bottom, all points of which must test the same distance from the line—6 1-2 feet in the particular case shown in the figure.

The traction ditcher, however, outclasses every other method of putting in tile drains. Fig. 6 shows one of them at work. It cuts a trench full depth, true to grade, ready for the tile in passing once over the ground. During recent years help has been so scarce in the country that many who wished to drain have been unable to get the work done. The ditching machine, if generally adopted—as it promises to be—will remedy this difficulty.

Underdrainage, in Ontario, is only beginning. Upwards of four million acres of the cultivated land needs drainage. At the present rate it would take 100 years to complete this amount. Then, besides, some five million acres of marsh, swamp, and slash will yet be brought into cultivation by means of drainage—the best of our land is now too wet for use. In this vast undertaking the systematic survey and the ditching machine will play the leading parts.

Significant to the Clay Tile Industry.

The clay tile industry has already felt the effect of the growing interest in drainage. Indeed it is from the reports of the tilemen that we learn that underdrainage has doubled in amount during the past five years—the number of tile made has doubled. And the supply has not kept pace with the demand in some parts of the province. Nothing better than clay tile has been put on the market, but continued shortage in places and a desire for cheapness are leading the people to cast about for a substitute. Many tile plants have doubled their capacity and some fifteen or twenty new ones have been established, and still there is a shortage in many localities. The clay tile industry must expand--and that very rapidly—if it is to cope with the growing demand.

Slag Paving Blocks have been manufactured for many years in England. The bricks, it is stated, are manufactured from molten blast furnace slag which is drawn into caldrons lined with fire brick. The caldrons are mounted on bogies for transmission to the brick plant. Slag is poured from the caldrons into iron moulds which have a hinged bottom and are mounted on the circumference of a circular iron framework which revolves and allows the moulds to be filled separately.

Pavements and Illumination

Pavements and illumination were recently associated in a novel way by Mr. Preston S. Millar, who claimed in a paper read before the Illuminating Engineering Society that the character of street surfaces has an important effect on street lighting. This is a novel source of complication to the already involved problem of paving, says the *Engineering Record*. The municipal engineer is expected to train his ear so well that the delicate shades of noise from granite and gneiss blocks can be detected and estimated quantitatively. He is expected to know just how much more easily a horse will slip on blue gum blocks as compared with those of long-leaf pine. He is assumed to know the effect on public health which will follow the paving of Main Street with sheet asphalt and Front Street with brick. He is also expected, ex-officio, to be able to purchase a $3.00 pavement for $1.25, with a 10-year maintenance guaranty thrown in by the contractor. All these things the city engineer has learned the expect among his official duties, but a protest is inevitable when it comes to selecting pavements on the basis of their properties for absorbing and reflecting light. A noisy pavement is a nuisance in some localities, a slippery pavement is dangerous on some grades, a smooth pavement offers special advantages in the way of cleanliness; these considerations are based primarily on the direct service due from pavements and must be given due weight. But it is unreasonable to select pavements with a view to improving the quality of street lighting, much as the electric companies would rejoice in this practice. By all means let us learn all we can about the absorption and radiation of light from street surfaces, but let it be distinctly understood that the information is to be used in improving the quality of the illuminating service and not in adding another condition to these now prescribed for pavements.

A concrete pavement with expansion joints was laid at Delphi, Ind., in the following manner: After the subgrade had been rolled it was covered with crushed limestone which was rolled to a thickness of 4 in. with a 10-ton roller. Next a concrete base 5-in. thick, mixed in the proportions of 1 part Universal Portland cement, to 7 parts gravel, was placed, the surface being left rough. A 1-in. wearing surface of 1 part cement to 2 parts sand was put on, floated with a cork float, trowelled, and gone over with a brush to roughen the surface. Expansion joints were put in every 40 ft. They were made with 1 x 6 in. boards beveled to ¼-in. on one edge and were extended through the gutters. After the top course had been spread the boards were removed and the joints filled with tar.

A road for four kinds of traffic, with a total width of 69 ft. and a length of 7¾ miles, is proposed in the County of Northumberland, England. The plan provides for a center footpath 9 ft. in width; on the east side of this path is a 24-ft. road for motor and light fast traffic. On the west side heavy, slow vehicles are to be accommodated on a 22-ft. road. Beyond the latter highway a width of 14 ft. is to be reserved for light railway or trolley purposes.

Screened refuse destructor clinker is being used in one of the large percolating filters of the sewage disposal works at Redditch, England. In a recent paper before the Institution of Municipal and County Engineers Mr. A. J. Dickinson states that the winter clinker makes a good tar paving for foot paths where the traffic is not excessive.

The New Grain Exchange at Calgary, Alta

One of the First Fireproof Structures erected in the Western Capital— Some Details of Design Contractors' Methods and Schedule

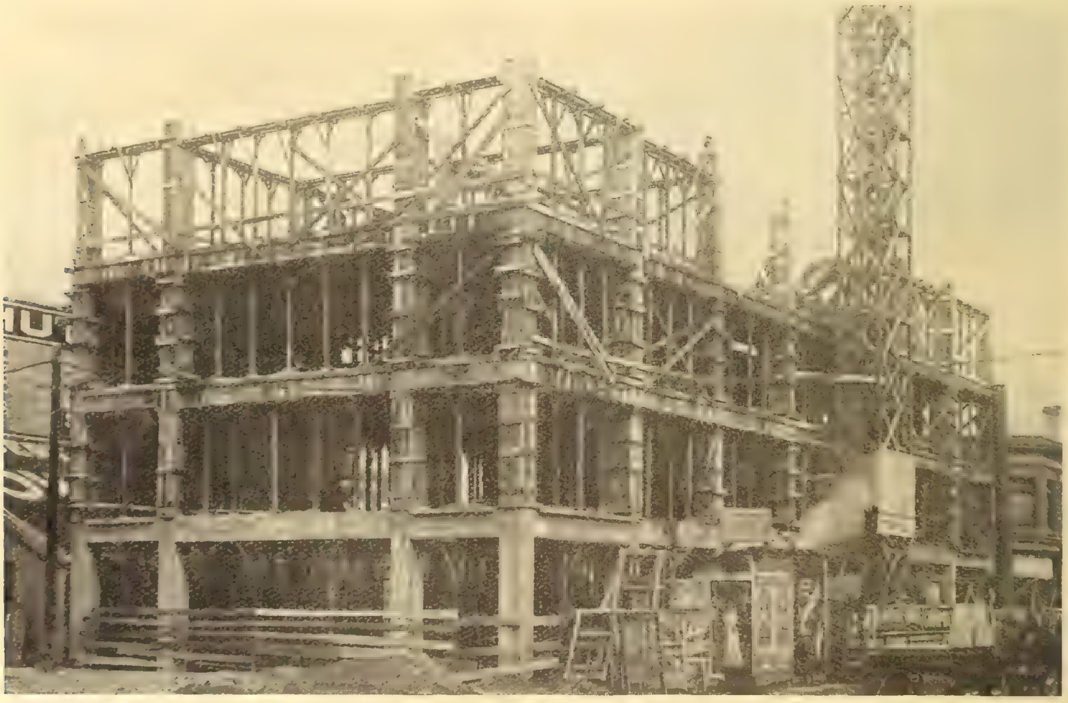
The Grain Exchange, Calgary, was one of the first fire-proof structures erected in Calgary. It has a frontage of 130 feet on First street West and 50 feet on Ninth avenue, two of Calgary's busiest streets, and presents an imposing appearance, being six stories in height, and 92 feet from sidewalk to top of coping. It is of skeleton reinforced construction, and is of Kahn design and material. Messrs. Hodkson, Bates & Butler, of Calgary, were the architects, and they have shown that the West is not one whit behind eastern cities in architectural design. The structure is faced with local sandstone, backed with brick on three elevations. The rear walls are 8″ reinforced concrete panels.

The interior is in accordance with modern office planning. An Otis-Fensom elevator has been installed. A wide staircase of concrete with non-slipping treads is a feature. There are roomy corridors and light offices. Lavatory accommodation is provided on each floor. The interior finish is of native woods, B. C. fir of selected grain being general. The show fronts and entrances are in oak with fine bevelled glass to the design of the architects. All the partitions are of metal and all lath is 24 gauge wire. The rear and lane windows are all according to underwriters' specifications, with polished wire glass. The corridor doors, which open on to the fire escape are kalameined doors with cast wired glass.

The contractors, Messrs. Geo. H. Archibald & Company of Winnipeg and Calgary, were confined as to working room and arrangements were made for a steady supply of crushed rock and other material as the work proceeded. A half-yard Ransome mixer was installed at the foot of a hoisting tower working in conjunction with an automatic skip. By this means three working days sufficied to pour the columns and slab of a floor and the contractors laid out a schedule of one floor per week. Unfortunately owing to a wash-out on the railroad, by which material was delayed, this schedule could not be maintained, although the dates as set out show that it could have been done.

Ground	June 11th, 1909
1	June 21st, 1909
2	July 8th, 1909
3	July 16th, 1909
4	July 23rd, 1909
5	Aug. 3rd, 1909
Roof slab	Aug. 14th, 1909

Possession was given to several tenants by December 14th, 1909, although the final touch was not given until the end of February, 1910, when the whole of the building was tenanted.


The New Grain Exchange at Calgary, Alta, in course of construction

Reinforced construction had not been employed extensively in the west at the time of operation and great difficulty was experienced in procuring men capable of framing and handling the steel.

The ratepayers of Toronto will be asked to vote $100,000, the city's share of the good roads fund. The County of York and the Provincial Government are each to contribute similar amounts. Extensive road work is under way and projected throughout Ontario. The County of Peel alone is spending $150,000 on the Dundas street highway, known as the Eaton road, within its limits.

Canadian Railroad Development

The Canadian Northern Railway is applying for a charter for a railway from Stewart, at the head of the Portland Canal, across northern British Columbia, north of the Grand Trunk Pacific to the eastern borders of the province, there to connect with a line to Edmonton.

The Montreal & Southern Counties Railway Company, of Montreal, is said to have plans under way for an extension of the Southern Counties across the peninsula to Chambly Basin and Richelieu. In connection with the plans the old Central Vermont is to be electrified and run in connection with the new electrical railway.

P. Hartnett and S. A. Eslick, composing the firm of Eslick & Hartnett, Spokane, Wash., have been awarded a contract for work on the construction of the Canadian Northern Railway on Vancouver Island. The contract is said to amount to about $250,000 and to involve considerable rock work. Construction work is to be started this month.

The Western Railway Company., incorporated by the Ontario legislature, is seeking a federal charter. It desires that its electric railway, authorized to be constructed from Toronto to London, with branches to Stratford, Woodstock and Wellesly, may be extended from London to Windsr in the same province and connecting therewith that ferries may be maintained across the Detroit river.

Calgary Grain Exchange Upon Completion.

The Provincial Government has passed an order-in-council providing for the building of a branch of the Temskaming & Northern Ontario Railway from a point on the main line near Kelso to Porcupine. The distance will probably be 30 or 32 miles, and the cost about $130,000. This work will be done under the powers given by legislation last session, and will be rovepeded with without delay. S. B. Clement, North Bay, Ont., is chief engineer.

Grading work on the Canada Northern Railway, between Belleville, Ont., and Trenton is now nearly completed. The location is exceptionally favorable, there being no deep cuts and little filling or elevating. Cuverts are being built and there is a small stee bridge to be erected east of Bellevilie. Work is being rushed. The grade is generally highly favorable, but there is some heavy grading where the line crosses two railways leading into the cement works at Belleville.

Since the announcement that the Government would build a branch of the T. & N. O. Railway into Porcupine from a point near Kelso, there has been some speculation as to whether it would be a steam or electric road. The price at which the road will be build, $450,000, did not seem to be enough, in the opinion of some men, to build a road through such a rough country. But the route to be taken by the new branch is not so rough as the country from North Bay north. From the main line to Night Hawk Lake there is a sand plain, which offers no difficulties for railroad construction. There will have to be a bridge built across the lake, and another over the Porcupine River, but outside of that there are no great difficulties to overcome.

Chairman Englehart, of the Temiskaming & Northern Ontario Railway, had a conference in Toronto last week with Superintendent J. H. Black and Chief Engineer C. E. Clement , regarding the immediate commencement of the work of extending the railway to the Porcupine district, in accordance with the decision reached by the Ontario Government. The preliminary survey made is a satisfactory one, but an n-strumental survey is now necessary, and this will consume at least three weeks. In the meantime, the purchase of supplies and material will be rushed and the right of way cleared. The commission will endeavor to make a record for rapid construction, and it is panned to have the ne completed before the end of next summer. No specal difficulty in getting labor is anticipated as some of the extra gangs employed on the existing line are laid off and most of them will go to work on the extension.

The Northern Construction Company, of Winnipeg, Man., which recently secured the contract for the first 60 miles of the Canadian Northern Railway, from Vancouver to Chiliwack, has also been awarded the contract for the work as far east as Hope, B. C., a distance of 79 miles from New Westminster. Construction will be prosecuted throughout the winter months. Tenders for the construction of the first section of the island line out from Victoria, B. C., will be called for at once. Rails for the Fraser Valley section have been ordered from the steel works at Sydney, Cape Breton, and will reach Port Mann by the end of April. No additoinal contracts for construction up the Fraser beyond Hope will be awarded until the railway commission announces its decision on the Canadian Northern application for approval of its right of way through a portion of the Fraser canyon near Lytton. M. H. MacLeod, Winnipeg, Man., is general manager of the Canadian Northern.

Latest reports from Western Canada regarding the progress on the Grand Trunk Pacific Railway announce that the grading, fencing, telegraph line and track laying has been completed on the Yorkton branch running north of Melville, the distance being 25¼ miles. Track laying has also been completed into Canora, a distance of four miles from Yorkton, and the end of this extension. On the Melville to Regina branch, a distance of 25 miles, the track laying fencing and telegraph line has been completed to Belcarres, and from that point to Regina is now under construction, also 90 miles of the branch from Regina towards the boundary are now under construction. On the Battleford branch, a distance of 48 miles, approximately 45 per cent. of the total grading has been completed. The grading on the Prince Albert branch, now under construction from a point west of Watrous on the main line, is 85 per cent completed, and track laying has been started. On the Calgary branch the track is laid to mile 47.

The Reader's Views on Current Topics

The Day Labor Discussion: City Engineer of Prince Albert Furnishes Costs—Training the Engineer-Contractor: Is Specialization Overdone?—A Definition

Prince Albert, Sask., Nov. 29, 1910.

Editor, "Contract Record":

Mr. Curtis' letter, published in your issue of Sept. 14th, seems to have provoked a very widespread expression of opinion on the above subject, though, with very few exceptions, your correspondents seem to do little more than touch on the general principles under discussion, without in any instance quoting a case to illustrate their contentions.

As Mr. Curtis in his letter undoubtedly refers to a certain contract for the construction of concrete sidewalks in the city of Prince Albert, the writer will explain briefly the situation with regard to that particular contract and show the results as they finally worked out.

The council, for various reasons, orginally intended doing this work by day labor, without calling for tenders, for which purpose they had entered into a contract for the supply of cement, had purchased a concrete mixer and had also engaged a superintendent to take charge of the work. The cement was purchased by sealed tender, three prices being submitted, viz., $2.94, $2.96 and $2.97 per bbl. The lowest tender was accepted, and the fact that the cement was supplied by a company in which one of the aldermen was interested was certainly not a factor in determining to whom the contract should be let.

At this stage a certain firm of sidewalk contractors appeared on the ground and, after putting forward various arguments, induced the council to call for tenders for the work of construction. Accordingly, specifications were prepared and tenders called for, with the result that two bids were received at 18 cents and 18⅛ cents per square foot respectively, while the estimate submitted by the city engineer as the porbable cost was 17 cents per square foot. After some discussion it was finally decided to do the work by day labor as originally intended.

The alleged advance in price to be charged the contractor for cement is purely imaginary, as the estimate was made at the same price at which the city agreed to furnish it to the contractor. Under the specification the cement was to be furnished to the contractor on the work as required, the city being responsible for all unloading from the cars, storing and hauling, and for returning the empty bags to the factory, also for all damage and loss until the cement was delivered to the contractor.

The writer has delayed taking part in this discussion until the season's work was completed and the costs were calculated so that accurate information might be submitted.

The actual working out of this contract was as follows:

Final estimate at prices of highest bidder,	$43,249.38
Final estimate at prices of lowest bidder,	42,569.93
Final estimate at prices of city engineer,	38,183.26
Actual cost of work,	35,527.66

This work was done under very adverse conditions which certainly added materially to the cost. Except for the finishers, there were no men obtainable who had ever done any work of this class before. Even a competent foreman to take immediate charge of the work could not be secured, so that the management lay entirely with the superintendent, who naturally was unable to devote his whole time to it, and in consequence a serious loss in the item of labor most certainly occurred. The qaulity of the work done evidently did not suffer as has been shown conclusively by numerous openings made in the new walks by the Telephone Company for the purpose of reconstructing their lines.

Nothwithstanding the figures given above, the writer does not contend that it is good practice to ask an engineer to bid on work in competition with contractors, but, particularly where the number of contractors bidding on work is limited, an engineer's estimate of the probable cost is necessary for the guidance of the body letting the contract, in order to protect the corporation from paying an excessive price for the work.

In municipal as well as in other work, it is vastly more important to secure the best possible construction than it is to cut the cost down to the last notch. It is not probable that any engineer would lower the quality of the work in order to keep the cost within the estimate submitted, but the charge made by some of your correspondents, that certain men would endeavor to make capital out of the fact, that they had done work at a low cost, is not altogether unfounded, and this, in itself, is sufficient reason for not holding city workmen too closely to a specified price.

The experience of laying water mains and sewers in this city has not been very favorable to the contract system. The original installation was made by contract and, notwithstanding the fact that the contract carried with it a nine months' guarantee and that the work was all done under inspection, both water mains and sewers have given continual trouble ever since. Several portions have had to be taken up and laid again. The contract work done since the first installation has, it is true, proved more satisfactory, but, whenever any work of this nature has been undertaken by day labor it has invariably cost less than the ruling contract prices and has always proved perfectly satisfactory.

To sum up, the writer is of the opinion that no general rule can be laid down for the guidance of a city council or city engineer in deciding whether a certain piece of work shall be let by contract or not. Local conditions, such as the charactor and magnitude of the work, with the difficulties likely to be encountered in its execution; the state of the labor market; the contractors available who are willing to undertake it; and numerous other considerations all have a very important bearing on the question. Furthermore, many pieces of work, for various reasons, contain a certain element of gambling which it is impossible to eliminate. There is no doubt that such construction should be done by day labor, as few contractors can be found who are willing to take serious chances—and if they do take them, a corporation has no right to get its work done at less than the proper cost to the contractor.

Should there be good reasons, apart from the question of price, for doing the work by day labor these should be determined beforehand and tenders should not be called for unless it is seriously intended to let the work by contract. Tenders being once called for, a council is committed to the necessity of letting the contract to the lowest tenderer, provided his price is not excessive and if he is financially able to carry out his contract.

In conclusion the writer would urge the point that an estimate from the city engineer should always be submitted for the guidance of the body awarding the contract, but that it should not be considered as a tender submitted in competition. And the work should not be done by day labor if a suitable contractor can be selected to do the work at a fair price. In the contract referred to by Mr. Curtis it would certainly be most unreasonable to expect the city of Prince Albert to pay out an extra $7,000 on a $35,000 contract simply because they had taken tenders for the work.

Yours very truly,
F. A. Creighton, City Engineer.

"Engineer-Contractor" Defined

Editor, Contract Record:

In my opinion contracting and engineering should be strictly separated. An engineer may with experience become a successful contractor, or a contractor may, by acquiring a certain amount of technical knowledge, become an engineer, but the Engineer-Contractor is a hybrid that the public justly looks upon with suspicion.

Very truly yours.
Willis Chipman.

"Specialization Going Beyond the Bounds of Reason"

Montreal, December 1, 1910.

Editor, Contract Record:

I have read with interest Mr. W. R. Harris' paper in your issue of November 2nd, in which he states that "many contractors have been disappointed in the work rendered by graduates of engineering colleges," and in which he suggests a new course for the already overworked student.

It seems to me, Mr. Editor, that any contractor who would take an engineering graduate and expect to receive the work of a man of experience has nobody to blame but himself. In the majority of such cases as have come under Mr. Harris' observation I should not be surprised to find that the employers were not only non-graduates, but that they have a mistaken notion of what a technical engineering course means. Happily such cases are rare in this country because, as I see it, the employers recognize in the engineering graduate a young man ready to commence to learn engineering. The years spent in college must only be considered as a training.

The tendency to specialization is going beyond the bounds of reason in the mad rush to obtain ready made employees. No person should think of "specializing" until he has mastered the general principles of his profession. These principles can only be thoroughly understood after years of actual experience. How then a man can "specialize" before leaving school is hard to understand. It sometimes seems to me that the students in all the applied science courses take the same work and lectures for at least the first three years at college. After that, perhaps. let their ways separate into the different branches. But even then the graduate is not a specialist nor even an engineer. He is well equipped to study engineering. If placed side by side with an untrained man who has been equally well endowed by nature for engineering work, the graduate will in a few years outstrip his running mate. This is as it should be, for the one has been receiving an emolument from his employer while the other has been spending time, energy and money to obtain a trained mind.

The suggestion to add particular branches to the engineering courses should not be adopted without serious thought, for there is more than enough in the present curriculum of any recognized engineering course to occupy the attention of the average student for four years. In my judgment the service of a reliable manufacturer or contractor is the best school in which any young man, graduate or not, can learn the proper value of the dollar and of the hour. If he be suited to the work in hand, and given a few months' opportunity, the graduate will fill the position and the employer will be able to pay such a salary that he will in the natural order of things become a permanent part of the organization.

Yours very truly,
Walter J. Francis.

Winnipeg Street Commissioner's Report

Some interesting figures are contained in the semi-annual report of Mr. W. F. Tallman, street commissioner, Winnipeg, Man. In the city at this time there are 335 miles of paved streets and 403 miles of sidewalks. The entire cost of caring for these thoroughfares for the first six months of this fiscal year from May 1 to October 31 was $154,621.91, as compared with a cost of $149,524 for the corresponding period of 1906, which shows a reduction in the cost of upkeep from $664.55 to $406.75 per mile. The commissioner reported that owing to the increased population of the city over 1906, which was approximately 33 per cent., traffic in the city had correspondingly increased to an extent, conconservatively estimated at 50 per cent. Of the yearly appropriation for street cleaning and maintenance there was still a balance of $40,370.09. The commissioner pointed out that the higher wages paid during 1910 had caused an increase of $1,300 a month in his salary lists. For materials used in repairs, during the six months, $19,061.82 had been expended. During the summer and fall seasons, 23,826,250 gallons of water have been used to flush the asphalt pavement and to sprinkle the other compounds used in paving, which is almost double the amount used in 1906. The cost of this water to the department was $2,812.20. In the matter of grading work, the department had saved $6,988.53 under the estimates.

Union of B. C. Municipalities

The 6th annual convention of the Union of British Columbia Municipalities held recently at Salmon Arm, B. C., was the most successful meeting ever held by the society. Among the many important subjects discussed were the good roads question, municipal advertising and town planning. Mayor Lee, of New Westminster, stated that transportation was the greatest problem before the people of British Columbia. If they could improve their roads and offer better transportation facilities, unprecedented development would follow. Mayor Bell, of Enderby, B. C., President of the Union, dealing with the subject of town and city planning, suggested that the Provincial Government be asked to pass the necessary legislation to insure intelligent planning and development work and the most satisfactory design of streets, so as to facilitate the installation of efficient sewerage systems, etc. Mayor Plante, of Nanaimo, B. C., was elected president, and Victoria, B. C. was selected for the 1911 conconvention.

The 7th annual convention of the American Road Builders' Association was held at Indianapolis, Ind., December 6-9. An important feature of the meeting was a splendid exhibition of the various materials and the most imporved machinery and appliances for road making and street paving. The programme was [illegible] comprehensive and covered practically every phase of the work. A number of the most interesting papers will appear from time to time in later issues of the "Contract Record."

Personal News and Notes

The "Contract Record" extends hearty congratulations to Mr. E. A. James, editor of the "Canadian Engineer," upon the occasion of his recent marriage.

Mr. Arthur St. Laurent, Mem. Can. Soc. C. E., Assistant Deputy Minister of Public Works, left Ottawa recently to attend the National Rivers and Harbours Congress at Washington.

The 7th annual convention of the American Road Builders' Association is now being held at Indianapolis. A comprehensive list of addresses has been arranged, these covering every phase of the subject. A number of Canadian engineers are present.

City Engineer Doan, of Halifax, N. S., has submitted his annual report, which contains detailed information on the waterworks system, the total cost of which to date is given as $1,243,137. The cost of maintenance for 1909-10 was $91,114.

The estimates for the next fiscal year presented to the Commons recently, amount to nearly 139 millions, an increase of more than 6 millions over the amount for last season.

Messrs. Fuller & Company, Limited, contractors, New York City, received the $600,000 contract for the erection of a new Art Gallery on Sherbourne street, Montreal. Only a portion of the structure, involving half this amount, is to be built at the present time.

On the 24th ult., Mr. A. C. D. Blanchard, who has charge of the Main Drainage Works for the city of Toronto, gave the members of the local branch of the Canadian Society of Civil Engineers an interesting talk on the design and progress of the Toronto sewage disposal system. The address was illustrated by a number of excellent lantern slides.

It is interesting to note that at Victoria, B. C., an effort is being made to arrive at the difference in cost of civic works done under the contract system and by day labor. Investigation is stated by the local press to have been brought about by the presentation of a bill for extras amounting to $3,300 by the Pacific Coast Construction Company, whose original contract price was $17,532.

Mr. James A. Bell, for 21 years city engineer of St. Thomas, Ont, has .finally resigned his position in order to devote himself exclusively to private practice. He is succeeded by Mr. Mason H. Baker, a sketch of whose career appeared in our issue of April 20, 1910. A short biography of Mr. Bell was published in the Contract Recor dof May 4, 1910.

It is reported on the authority of Mr. Wm. Phillips, general eastern agent of the C. N. R., that the company will be running into Hamilton by next fall. Construction work has already been started east of Oakville and every effort will be made to get the line in operation before next winter. The C. N. R. officials refuse to say what route will be used for an entrance into the city or to give any information as to the possibility of the C. N. R. and C. P. R. building a union station.

City Engineer Clement, of Vancouver, has prepared an itemized statement of the work accomplished by his department during the current year. It shows that no less than 23 miles of concrete walks and 2½ miles of curbing have been laid. There have been four miles of plank roadways, 30½ miles of new streets opened up and graded, 10 miles rocked and 3.45 miles graded permanently. There have been 3.1 miles of paving completed and 9.1 miles are still under way.

The Architects' Association of Victoria, B. C., has been organized with the following officers: E. M Rattenbury, hon. president; S. Maclure, president; W. Ridgway Wilson, vice-president; H. S. Griffith, J. C. S. Keith, Crawford Coates, committee; P. Leonard James, secretary-treasurer. The association has offered to aid the city in revising the building by-laws, some of the clauses of which, as at Toronto, Montreal and other places, are very antiquated.

The western provinces of the Dominion have ben asked by Hon. Thomas Taylor, Minister of Public Works for British Columbia, to co-operate with the latter province in the construction of a trunk line highway from Winnipeg to Vancouver. British Columbia already has plans laid for the construction and completion of its share of this road. Alberta is well along, and the matter has been taken up in the other provinces on the route. When this highway is completed it will give the longest continued stretch of first-class road in the world.

A report has been made by Mr. George Janin, chief engineer and superintendent of the Montreal waterworks, upon the report submitted by Messrs. Hering & Fuller, who estimated the cost of filtration and water extensions, $1,687,000. Mr. Janin agrees with the plans outlined, but states that it will be necessary to make an appropriation of $318,670 to cover the cost of extra land and also to devote the sum of $675,000 for the enlargement of the equeduct, laying of intake pipes and installing machinery.

At a recent meeting of the South Vancouver council a communication was read from City Engineer Clement, of Vancouver, who forwarded a copy of a motion passed by the Vancouver board of works and approved by the council with reference to the employment of a consulting engineer for Greater Vancouver. This was discussed and it was finally decided that Vancouver be informed that the municipal council did not propose to engage an engineer jointly with the city, but requested the City of Vancouver to join with South Vancouver in securing the services of an engineer for the special purpose of supervising sewer wor for Greater Vancouver.

Messrs. Brown & Vallance, architects, Montreal, have opened a Winnipeg office in the McArthur Building, in charge of Mr. E. E. Sheppard, who for the past four years has been western representative of the Dominion Bridge Co., Ltd., Montreal.

The 5th annual dinner of the Manitoba Association of Architects was held in Winnipeg on the 24th ult. The officers elected at the business session held prior to this function were: president, J. D. Atchison; vice-president, Victor Norwood; second vice-president, John Woodman; secretary, J. Pender West; treasurer, Donald A. Ross. Among the guests at the banquet was Col. Ruttan, city engineer of Winnipeg. Replying to the toast, "Our Sister Societies," the Colonel referred to the coming convention of the Canadian Society of Civil Engineers, which is to be held in Winnipeg next month.

The annual meeting of the Ontario Portland Cement Company, Limited, was held at Brantford, Ont., on the 2nd inst. The director's report and auitor's statement were presented and disclosed a most satisfactory state of affairs. The report dealt with the business generally, the outlook for the future, the increased production and sales, which were larger than ever before, and also stated that the company had continued along independent lines. The old directors, Messrs. E. L. Goold, W. S. Wisner, A. A. Bixel, H. Cockshutt and A. E. Watts, were re-elected, and a resolution passed heartily thanking the directors, officers and staff for the able manner in which they had conducted the affairs of the company during the past year. At a subsequent meeting of the directors the following officers were elected: E. L. Goold, president; W. S. Wisner, vice-president; John A. Colter, manager; S. H. J. Reid, secretary, and A. A. Barrett, treasurer.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

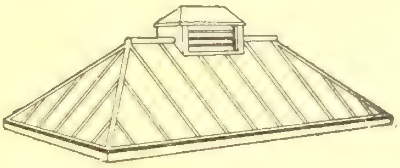
Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting

for Conveying and Transmission

Made in widths up to 66" and in four thicknesses.

Equally good in WET and DRY places.

Is not made in plies and cannot come apart.

Write for Bulletin "B" and discounts.

Federal Engineering and Supplies
Limited
284 Yonge Street - TORONTO

Agencies
Montreal, Power Economies Ltd Ottawa, McDougall's Limited
Pt. Arthur, Marks-Clavet-Dobie Ltd Calgary, Great West Saddlery Co.
Cobalt, Geo. Taylor Hardware Co.

Agents Wanted in Other Cities.

Tenders

For Roofing and Sheet Metal Work

in all parts of Canada

Communicate with

A Schwoerer & Sons, Inc.

530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

Architects Owners

Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works	Office and Warehouse
Keele St. & Weston Rd.	Yonge St. & C.P.Ry.
West Toronto	North Toronto

Write for booklet

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

The Calkins Tile & Mosaic Co., Limited

458 Bleury Street,
Montreal

Tiles
Mosaics
Ceramics
Quarries
Marbles

We handle all classes of work from the largest contracts to the smallest requirements of the marble and Tile trade. Write us for prices.

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor

Commercial Travellers Building - Winnipeg

Harry Allen Jacobs,
Architect, N.Y. City

Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

Port Credit Brick

Wire Cuts and Repressed

Wire Cuts and Pressed Brick

Hard Builders for Cellar Work
Second-Class Brick for Inside Work
Dark Faced Red Pressed Brick
Light Face Brick
Special Dark Face Veneer Brick

Our plant has recently been enlarged in such a manner as to enable us to supply these lines to the very best advantage.

We have now one of the finest plants in every particular in America

"Brick," the leading clay journal of the United States, in its January number, says of our plant:

"When completed the plant will be one of the largest and best arranged plants in America, and anyone who desires to see a modern, well built and well designed plant in operation, a trip to the location would not be amiss."

Prices Furnished on Application.

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street, W., Toronto
Works: Port Credit, Ont.
Office Phone, M. 3167 Yards Phone, Col 4853

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established 1882
THE COMMERCIAL
The Weekly Financial, Commercial & General Trade Newspaper of the Great West.
Winnipeg Manitoba

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.
Limited
Phone 423 and 2457
——HEAD OFFICE:——
Room 36, Federal Life Building, HAMILTON, ONT.

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St. Louis

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

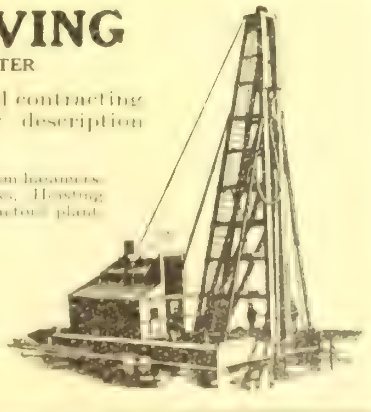
Steel and Wood **TANKS**

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG



PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY
CRUSHED STONE ALL SIZES
Rubble and Cut Stone, Lime, Sewer
Pipe, Fire Brick, and Common Brick
JOHN MALONEY Queen and Dufferin Sts., TORONTO
Office Phone P. 64 Residence P. 1040

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE
VANCOUVER B.C.
P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Water-Power Plants

Turbine-units from 1-4 up to 18,000 H.P. built

for any head and any output

—Highest efficiency—

CENTRIFUGAL PUMPS, PAPERMAKING MACHINERY, AIR COMPRESSORS

Apply to

Escher Wyss & Co., Limited

Engineers

London Office: 109 Victoria Street, Westminster, S. W., England.

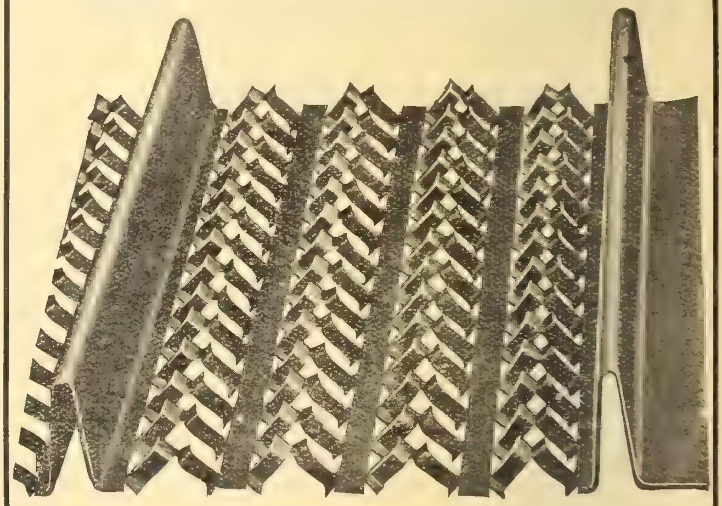
Works: Zurich (Switzerland)

KAHN SYSTEM

Products include

HY-RIB

Combination of metal, lath and chourul in one sheet. Does away with expensive wiring, studding also Form work when used as reinforcement for floor or roof slab.



Trussed Concrete Steel Co.

of Canada, Limited

Head Office: Walkerville

Branches: Toronto, Winnipeg, Montreal, Vancouver,

Agencies: Quebec, Halifax.

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work
and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and
Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and
Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

Waterworks, Sewerage and Electric Plants
Concrete and Steel Bridges and Buildings
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

Consulting Engineer

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

Frank Barber, York County Engineer. C. R. Young, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

JAMES TAYLOR

Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. **Montreal**

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following [illegible] at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50
Brass Goods [illegible]		
96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile [illegible] 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression [illegible]

High grade [illegible]

Fuller work, [illegible]

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 65 per cent.

No. 1 [illegible]

No. 1½ [illegible]

Square head brass cocks, 65; iron, 65 per cent.

[illegible]

Hot water boilers, 50 and 10 per cent.; hot water radiators, [illegible] radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as [illegible]

[illegible]

30 gallon [illegible]

[illegible]

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

[illegible]

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; [illegible]

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
[illegible] inch	$ 2.03	[illegible]	$ 2.86
[illegible] inch	2.25	[illegible] inch	3.08
[illegible] inch	2.63	[illegible] inch	3.48
[illegible] inch	[illegible]	[illegible]	[illegible]
[illegible] inch	4.70	1 [illegible]	6.35
[illegible] inch	6.41	[illegible]	[illegible]
1½ inch	[illegible]	1½ [illegible]	10.40
2 inch	10.26	2 [illegible]	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	[illegible] inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.65.

Cement, car lots, f.o.b. Toronto, bags extra, $1.70

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $14 to $15 per toise.

Free stone delivered, 14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, $1.05 per gallon.

Pure Linseed Oil Putty, 25 lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The [illegible] Co., Montreal, are stated to have dissolved.

[illegible] Que., [illegible] dissolved.

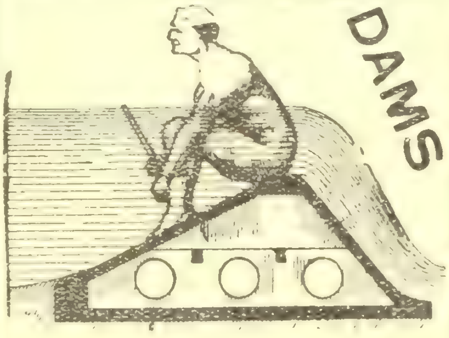
[illegible] Que., [illegible] dissolved.

Abbottsford Shingle Co., Abbotsford, B. C., [illegible] McCallum.

[illegible] to C. Francis.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock
Office and Works:
[illegible] 63 Esplanade E. TORONTO

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
The
Katie
Foundry,
Galt, Ont.
Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished. References Given.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe re-requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

Interior Woodwork

Store and Office Fittings House Finish

Made of

Birch, Mahogany, Plain Oak, Quartered Oak etc.

S. Anglin & Company
Kingston, Ontario

"The best is cheapest"

"Sanorto"

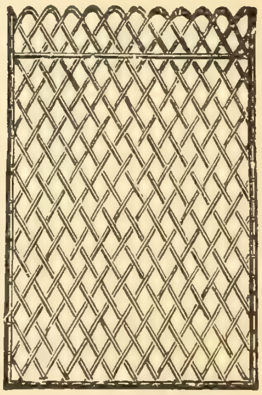
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof

For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc. has always given the greatest satisfaction.

Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

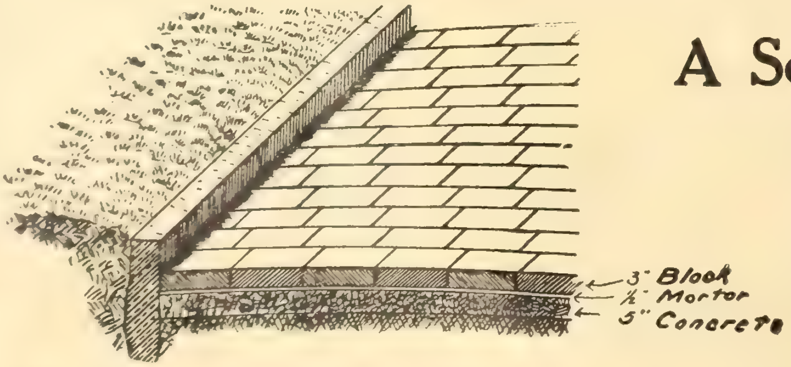
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

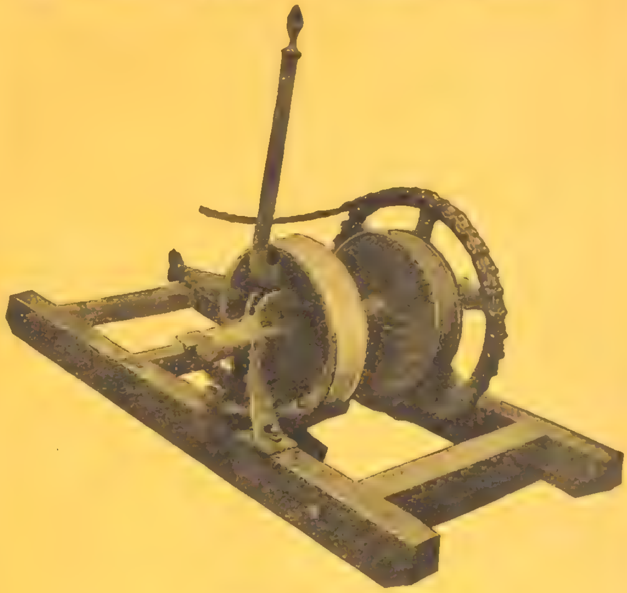
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

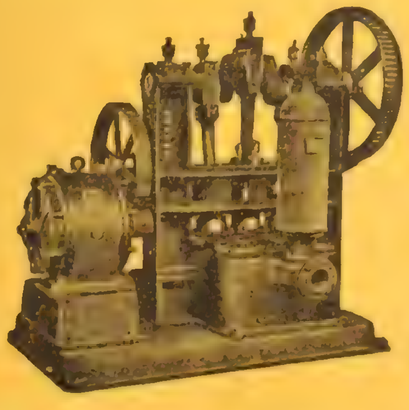
The London Gas Power Co., Limited

Engineers and Machinists **London, Canada**

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**

Phone Main 1054

Works: Seneca Falls, N.Y.

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills Limited

Midland, Ontario

"Kilindo" Wire Rope is absolutely free from any tendency to rotate with or without the load.

"Kilindo" Wire Rope does not kink. "Kilindo" Wire Rope is constructed of wire of a round section.

"Kilindo" Wire Rope is less liable to the crushing action which takes place in other ropes.

"Kilindo" Wire Rope is the only rope built of round wire which can be made Langs Lay, and yet be perfectly non-rotating.

"Kilindo" Wire Rope can be supplied in all sizes and in all lengths.

Kilindo WIRE ROPE

·MANUFACTURED BY·

THE DOMINION WIRE ROPE CO. LIMITED
·MONTREAL·

We have gone to considerable expense in equipping our plant so as to turn out this new cable to the very best advantage and therefore solicit your kind enquiries when next in the market for Hoisting Cables for Derricks, Cranes or other services.

We carry a complete stock of wire ropes for every purpose, also everything in the way of fittings, such as Blocks, Clips, Thimbles, Turnbuckles, Shackles, Sockets, Hooks, Sheaves, etc., etc.

Write us for prices and full particulars.

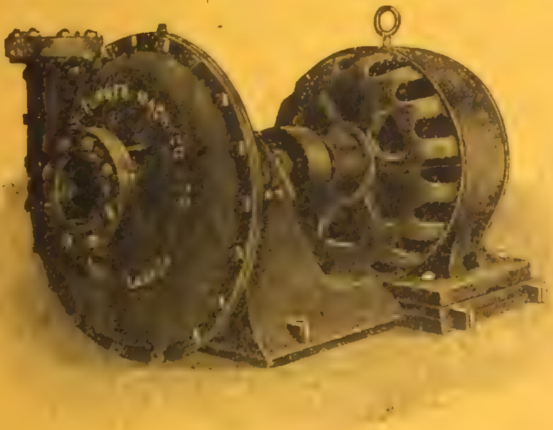
Vol. 24 Toronto, December 21, 1910 No. 51

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.



The **Smart-Turner Machine Company**
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

Large Bent Plate Glass for Shop
Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

Lowest Prices for Import
on

Structural Material

ANGLES BEAMS
CHANNELS PLATES
TEES, Etc.

Try us with your next enquiry

A. C. Leslie & Co., Limited
Montreal

Machine Banded Wood Stave

WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Architects and Consulting Engineers

When considering Boilers for heating purposes, allow us to quote with specifications. We build them in all sizes and strictly to conform to the underwriters regulations.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

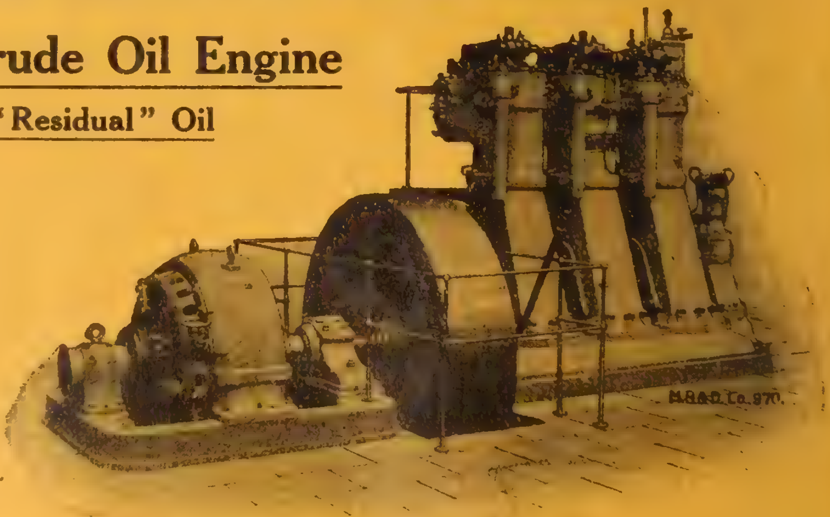
3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil



No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdown
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page
Canada Wire Goods Mtg. Co. 19
Dennis Wire & Iron Works 19

Air Compressors
Escher Wyss & Co 62

Belting
Federal Engineering & Supplies, Ltd 55

Boilers
Inglis, John 26
Jenckes Machine Co. 2
Leonard & Sons, E. 55
Marsh & Henthorn 55
McDougall Caledonian Iron Works 33
Mussens Limited 34
Taylor-Forbes Co 15
Waterous Engine Works Co. 62

Brick
American Enamelled Brick Co.
Canadian Pressed Brick Co. 59
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 10
Milton Pressed Brick Co. 24
Port Credit Pressed Brick Co. 59
Toronto Pressed Brick Co.

Bridges (Steel)
Canadian Bridge Co. 60
Cleveland Bridge Co. 60
Dickson Bridge Works
Dominion Bridge Co. 60
Phoenix Bridge and Iron Works 61
Pennsylvania Steel Co. 60

Builders' Hardware
Taylor-Forbes Co. 15

Cement
Alsen Portland Cement Co. 66
Britnell & Co. 18
Bremner, Alex. 63
Canada Cement Co. 3
McNally & Co., W. 59
Morrison & Co., T.A. 64
Rogers, Alfred 4
Rogers Supply Co. 33

Conduits Page
Conduits Co., Limited 63

Concrete Pipe
Lock Joint Pipe Co.

Concrete Mixers and Machinery
Canada Foundry Co. 10
Cropp Concrete Machinery Co. 6
Hopkins & Co., F., H. 68
Jenckes Machine Co. 2
London Concrete Machinery Co. 25
Mussens Limited 34
Morrison & Co., T. A. 64
Rogers Supply Co. 33

Concrete and Steel Reinforcements
Ambursen Hydraulic Construct'n Co. 65
Canada Wire Goods Mtg. Co. 19
Hamilton Iron & Steel Co. 24
Trussed Concrete Steel Co. 12

Contractors' Plant
Beatty & Sons, M. 19
Hepburn, John T. 36
H. & E. Lifting Jack Co. 13
Hopkins & Co., F. H. 68
Katie Foundry Co 65
Marsh & Henthorn 55
Mussens Limited 34

Crushers (Stone and Rock)
Hopkins & Co., F. H. 68
Jenckes Machine Co. 2
Mussens Limited 34
Morrison & Co., T. A. 64

Corrugated Iron
Galt Art Metal Co.
Metallic Roofing Co. 55
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 5
Roofers Supply Co. 63

Contractors Page
McIlwraith, Jas. A. 64
Nadel & Adler 64

Drills
Beatty & Sons, M 19
Canadian Rand Co. 1

Deafening Felts
Cabot, Samuel, Inc. 59

Drilling Contractors
Harvey, J. 65

Dredges
Beatty & Sons, M 19

Engines
Canadian Boving Co. 2
Inglis, John 26
Jenckes Machine Co. 2
Leonard & Sons, E 59
Mussens Limited 34
Waterous Engine Works Co. 62

Excavators
Harris, J. W. 11

Electrical Apparatus and Supplies
Northern Electric & Mtg. Co.

Engineers (Civil and Mechanical
Barber & Young 64
Chipman & Power 64
Bowman & Connor 64
Farmer, John T. 64
Fuce, Edw. O. 64
Galt Engineering Co., John 64
Glaubitz, H. J. 64
Hunt & Co., Robt. W. 59
Inglis, John 26
Kennedy, Jas. C. 64
Lea & Ferguson 64
Mace, T. Harry 64
Mitchell, C. H. 64
McRae, John B. 69
Moore & Scollan 64
Taylor, James 64

Fire Apparatus Page
Morrison & Co., T. A. 6
Seagrave, W E. 6

Fireproof Doors and Windows
Douglas Bros. 14
Mussens Limited 34
Ormsby, A. B. 5

Gauges, Steam, etc.
Marsh, Jas. P. 19

Granite and Marble
Laurentian Granite Co. 64
Missisquoi Marble Co. 15
Rogers Supply Co. 33
Smith Marble & Construction Co. 58

Glass
Chance Brothers & Co.
Consolidated Plate Glass Co.
Luxfer Prism Co.
Thompson & Co., B. & S. H.
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 59
Taylor-Forbes Co

Hoisting Machinery
Beatty & Sons, M. 19
Inglis, John 26
Jenckes Machine Co. 2
Hopkins & Co., F. H. 68
London Gas Power Co. 67
Marsh & Henthorn 55
Mussens Limited 34

High Pressure Pipe Lines
Escher Wyss & Co. 58

Hydrants
Canada Iron Corporation 63
Gartshore-Thomson Pipe Co. 62
Kerr Engine Co. 22

Interior Fittings
Lickleys Limited 16

Lime
Christie, Henderson & Co. 17
Jamieson Lime Co. 61

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS

PHONE MAIN 4345 28 King Street West, TORONTO

MODERN.

STRONGER.

CHEAPER.

→ ESTABLISHED 1861. ←

MUNDERLOH & Co. Ld.

Sole Agents in CANADA

for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

MADE UP TO 40 FEET IN LENGTH.

51 VICTORIA SQUARE,

MONTREAL.

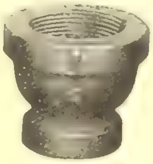
RELIABLE

Semi Steel Fittings

RETURN BEND

PIPEHANGES

Y BRANCH



REDUCER

HEADER

CROSS

A fitting for every purpose

TRY THEM

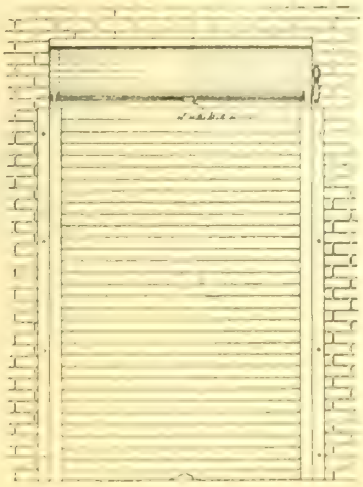
Standard Fitting & Valve Co.

Limited

GUELPH - ONTARIO

The Durability of our Rolling Steel Door

is extraordinary



At the N.Y. C.R.R. Sheds, 31st Street, New York, our **Rolling Steel Doors** have been in continual service **for over twenty-three years** and still give the very best of satisfaction. Durability and ease of operation are as big a feature in our Rolling Steel Doors as their Fireproof Qualities. Specify our patented Rolling Steel Door. It has everything in its favor.

Experts in Fireproof Windows and Doors.

A. B. ORMSBY, Limited

Factories:

Cor. Queen & George Sts. TORONTO

677-81 Notre Dame Ave. W. WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :

Sand & Supplies, Limited,

Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited

Hagersville - Ont.

Lumber and Interior Finish

	Page
[illegible]	66
[illegible] Limited	16
[illegible] Ltd	25
Eaton & Sons, J. R.	25
[illegible] Box Shook Mills	67
[illegible] & Co	20
[illegible] Floor Co	66
[illegible] Bros	67
Tillson Co	18
Woodstock Lumber Co	66

Metal Lath

Galt Art Metal	20
Metallic Roofing Co	55
Noble C. W.	20

Meters

Hopkins & Co., F. H.	68
[illegible] Meter Co	17

Paving and Paving Materials

Dominion Carbolineum Works	21
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	66
Silica Barytic Stone Co. of Ontario	65

Plaster

Albert Mfg. Co.	
Britnell & Co	18

Pip

Canadian Pipe Co.	62
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	62
[illegible] & Co.	5
Municipal Construction Co	16
National Iron Works	63
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	26

Paints and Varnishes

Cabot, Samuel, Inc.	59
Glidden Varnish Co.	
International Vaurish Co.	19
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	61

Pumps and Pumping Machinery

Beatty & Sons, M.	19
Escher Wyss & Co.	
Goulds Pump Co.	
Hopkins & Co., F. H.	68
Inglis Co , John	26
Leonard & Sons, E	59
Martin Steam Pump Co.	20
McDougall Caledonian Iron Works, John	33
Mussens Limited	34
Ontario Wind Engine & Pump Co.	19
Smart-Turner Machine Co.	1
Waterous Engine Works Co	62

Roofing Materials

Barrett Mfg. Co.	
Galt Art Metal Co.	20
Metallic Roofing Co.	55
Metal Shingle & Siding Co.	
Noble, Clarence W	20
Rogers Supply Co.	33
Roofers Supply Co.	63

Railway Supplies

Factory Products Limited	
Gartshore, John J.	64
Hopkins & Co., F. H.	68
Mussens Limited	34

Road Machinery

American Road Machinery Co.	11
Case Threshing Machine Co.	11
Climax Road Machine Co.	11
Morrison & Co., T. A	64
Mussens Limited.	34

Sewer Pipe

American Sewer Pipe Co.	18
Britnell & Co	18
Canada Iron Corporation	63
Dominion Sewer Pipe Co.	13
Gartshore-Thomson Pipe Co.	62
Hamilton & Toronto Sewer Pipe Co.	13
Lock Joint Pipe Co.	8
National Iron Works	63
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	33
Standard Drain Pipe Co.	13

Sand

Rogers Supply Co.	33

Stone

	Page
Britnell & Co.	18
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	18
Corinthian Stone Co.	17
Crushed Stone, Limited	59
Doolittle & Wilcox	63
Hagersville Contracting Co.	5
Laurentian Granite Co.	64
Maloney John	61
Morrison & Co., T. A.	64
Myers, Oakley	59
Rogers Supply Co.	33
Roman Stone Co	17
Sackville Freestone Co.	9

Submarine Driver

Roulean, Joseph N.	65

Structural Iron and Steel

Dominion Bridge Co.	60
Hamilton Iron & Steel Co.	24
MacKinnon Holmes & Co.	61
Pennsylvania Steel Co.	60
Phoenix Bridge & Iron Works	61
Reid & Brown	64
Salter, W. H	61

Shovels (Steam)

Beatty & Sons, M.	19
Canada Foundry Co.	10
Hopkins & Co., F. H.	68
Mussens Limited.	34

Shingle Stains

Cabot, Samuel, Inc.	59
Roofers Supply Co.	63

Steel Shingles and Ceilings

Galt Art Metal Co.	20

Smoke Stacks

Leonard & Son, E.	59

Safes and Vaults

	page
Taylor, J & J	61

Stone Cutters

Bailey-Underwood Co.	66

Sheathing Papers

Cabot, Samuel, Inc.	59

Telephone Supplies

Northern Electric & Mfg Co.	

Tiles

Smith Marble & Construction Co.	58

Tanks and Stand Pipes

Inglis, John	26
Jenckes Machine Co.	2
Leonard & Sons, E.	59
Marsh & Henthorn	55
McDougall Caledonian Iron Works	33
Ontario Wind Engine & Pump Co.	61

Valves

Canada Iron Corporation	63
Gartshore-Thomson Pipe Co.	62
Kerr Engine Co.	22
Marsh & Co, Jas.	19
Standard Fitting & Valve Co.	5

Ventilating System

Gardiner & Gaskill	18

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	59

Wire Rope

Dominion Wire Rope Co.	68
Greening Wire Co., B.	66
Smith, Thos. & Wm.	

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	19

Water Wheels

Canadian Boving Co.	2

Water Turbines

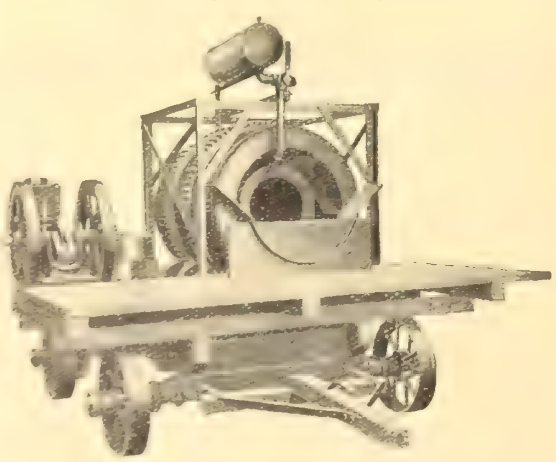
Escher Wyss & Co.	62

The Low Charging

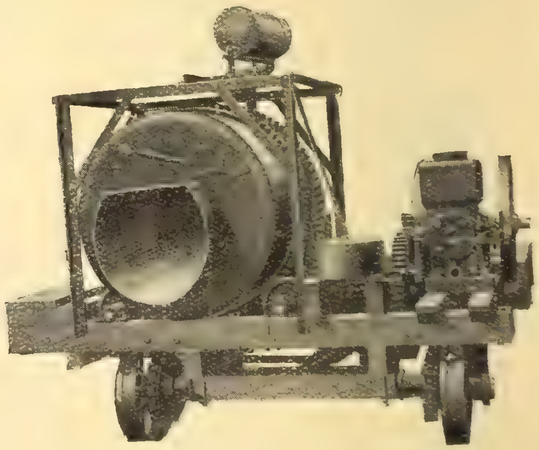
CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge
covered by Patent 947196.



Either Steam or Gasoline Engine



Our Prices will Interest You.

The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. **MANNAN SMITH SUPPLY CO., St. Joseph Mo.**

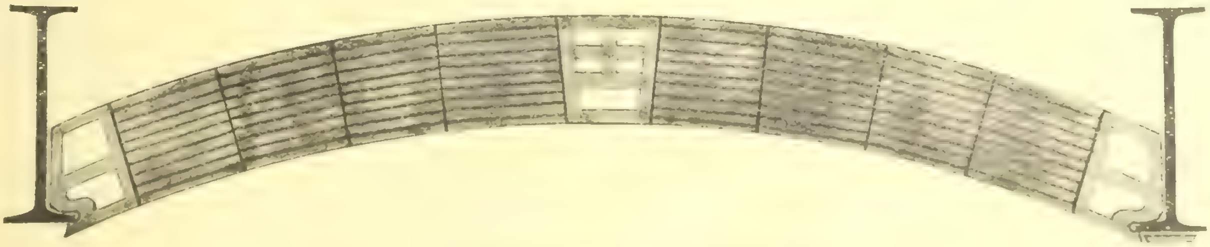
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering	**Furring**
Arches	**Blocks**



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick	Enamelled Brick
Vitrified Brick	Wire-Cut Brick

Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

45 inch and 42 inch Pipe for Brantford, Ontario

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

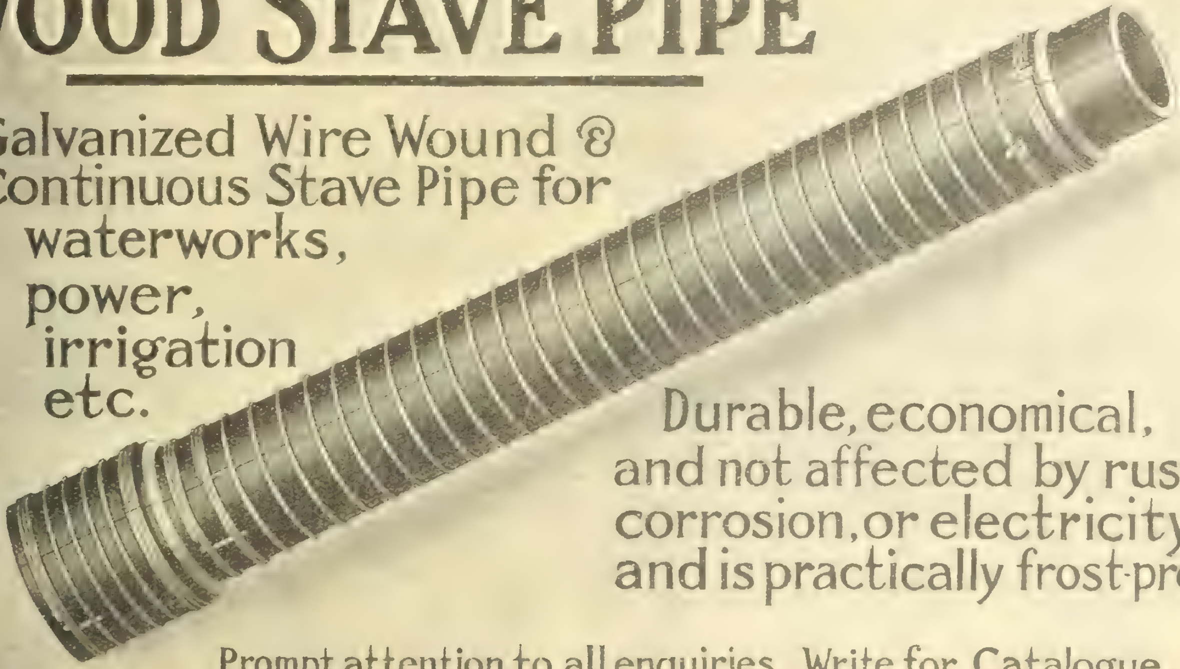
Write for Illustrated Catalog

WINNIPEG, MAN.—F. H. McGavin Co., Ltd.
SEATTLE, WASH.—Pacific Lock Joint Pipe Co.
LOUISVILLE, KY.—Harris Engineering Co.

MONTREAL, QUE.—Francis Hankin
CHATTANOOGA, TENN.—Howard Egleston
HAVANA, CUBA.—Huston Concrete Co.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B. C.

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

HENRY NEW, President. ROBERT W. NEW, Vice-President.

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company, Limited

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

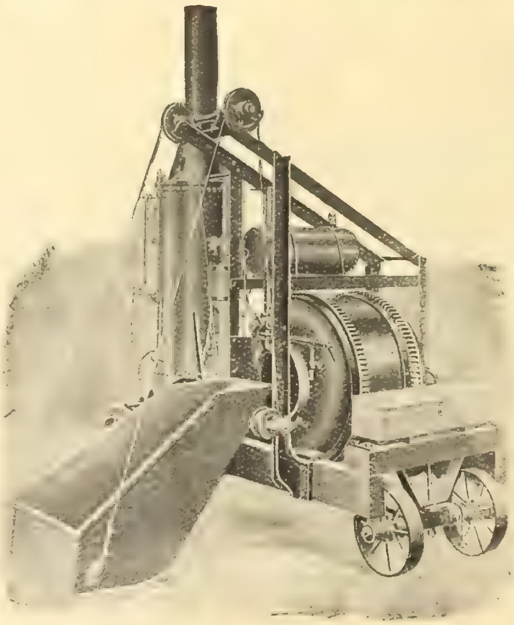
Koehring Concrete Mixers

Steam, Motor or Gasoline Drive

Simple in Operation

Substantial in Construction

Made in sizes to meet all requirements.



Koehring Mixers have proved their superiority by quick action — uniformity of mixture, and reliability under the most exacting conditions.

MANUFACTURED AND SOLD IN CANADA BY

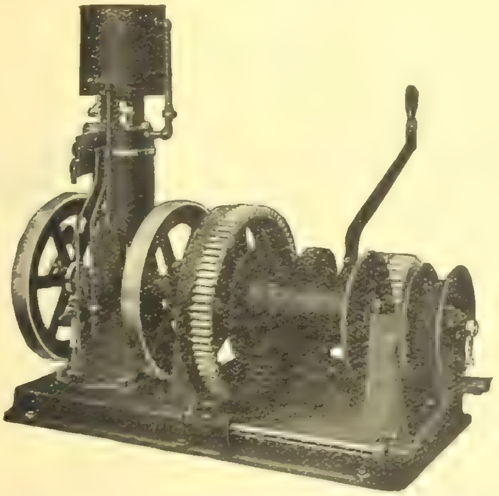
CANADA FOUNDRY COMPANY, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Climax Hoisting Engine

for running two platform Material Elevators

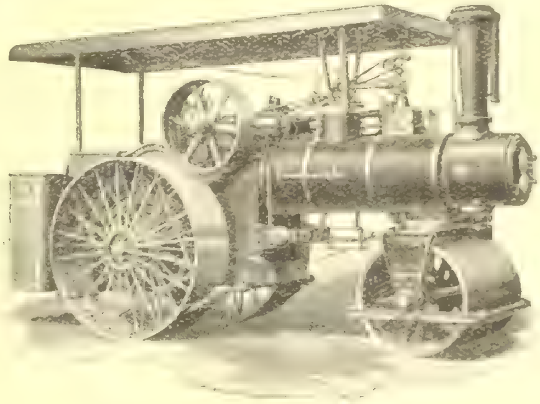


Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company
Hamilton, - - Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario

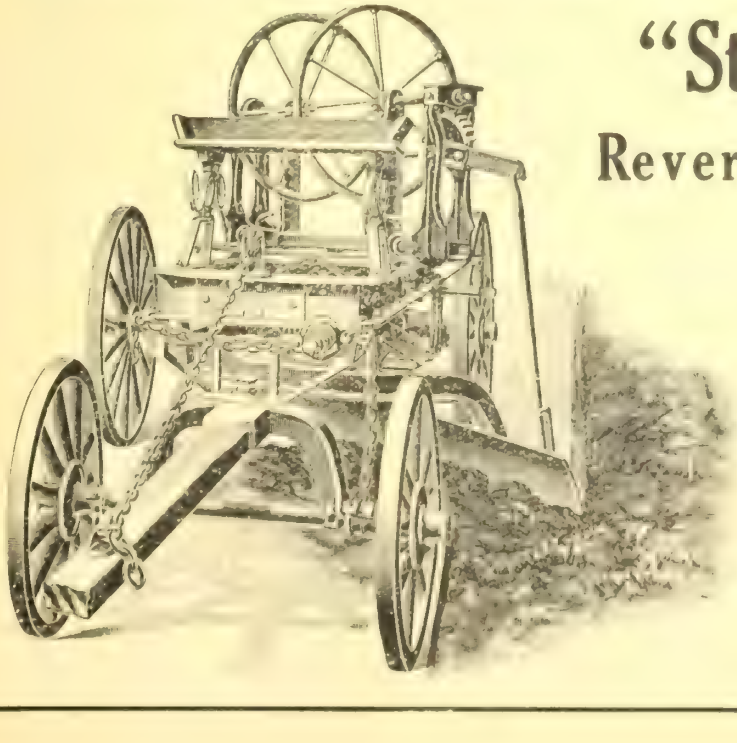
Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY if you do your Road Making with a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

Canada's Largest Reinforced Concrete Building

constructed throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS—If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS –if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

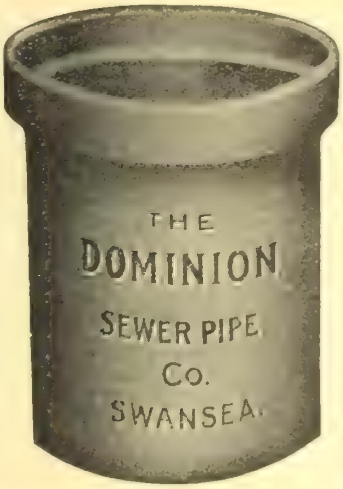
Branches: Toronto, Montreal, Winnipeg, Vancouver

We wish our many customers all over Canada

A Very Merry Christmas
and a Prosperous New Year

The Hamilton and Toronto Sewer Pipe Company, Limited
Hamilton and Toronto

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert **Pipes**

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material best grade of [illegible]. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on [illegible] days trial.

MANUFACTURED BY
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

Merry Christmas and Happy New Year

to all readers of the

Contract Record

and especially to those who have contributed their portion of orders to our year's business

We thank you heartily. Come again in 1911

May all the joys of the Festive Season be yours

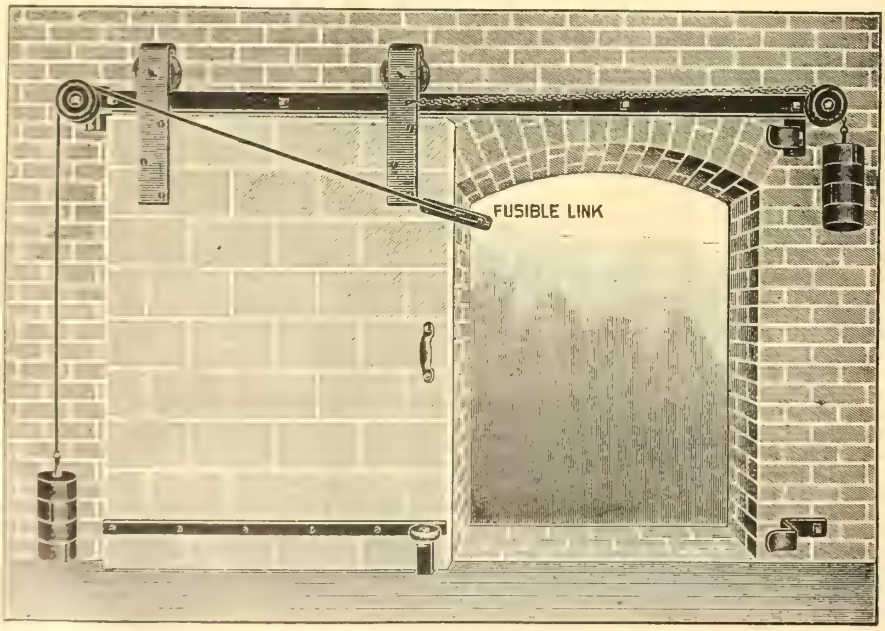
And may next year be

A Bumper For All

PRICES ALWAYS RIGHT

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones:—Toronto Connection, Park 422—Evenings, Park 3888 and 3889

Level Slide Fire Door



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

Right Here in Canada

Architects and Contractors can obtain marble with all the richness and depth of color that is to be found in the finest imported product.

Missisquoi Marble

is quarried in six distinct varieties which afford excellent opportunities for following out beautiful color schemes.

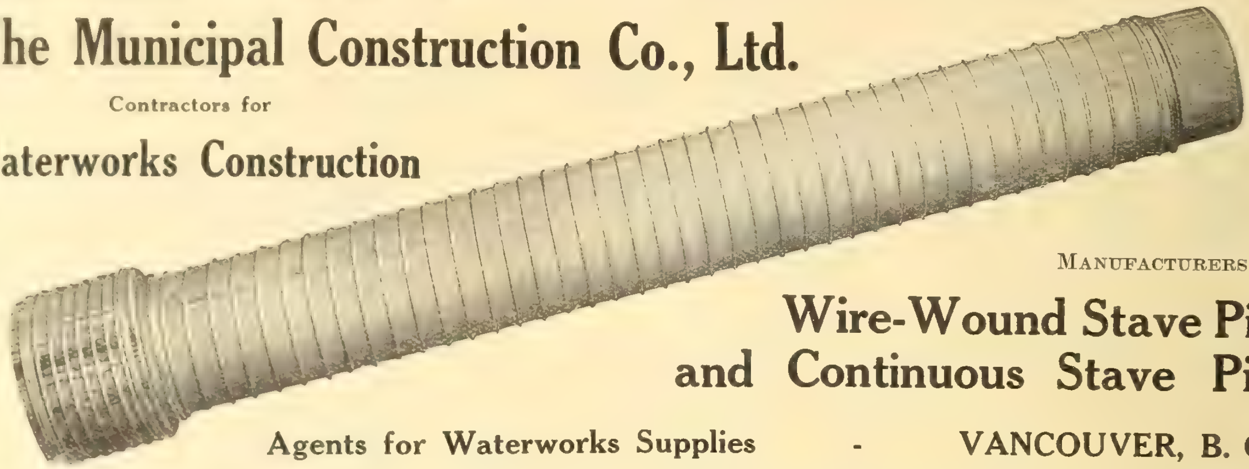
Light Grey
Dark Grey
Green Grey
Cream with Green Vein
Cream with Mottled Green
Cloudy Green and Pink

The Missisquoi Marble Co., Limited

Philipsburg, Quebec   **Coristine Building, Montreal**

District Sales Agents :

David McGill, Montreal, Que.
Eadie-Douglas Co., Toronto, Ont.
C. N. Barclay, Winnipeg, Man.
W. N. O'Neil & Co., Vancouver, B.C.
General Contractors' Supply Co., Halifax.



The Municipal Construction Co., Ltd.

Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.

WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

Our Specialties
Special Mantels
Staircases
Panelling
Bank Fittings
Office Fittings
Glass Partitions
High Class Doors
House Fittings

Phone Main 3166 After Business Hours College 1097

Lickleys Limited

MAIL BUILDING

TORONTO

Estimates Given.
We supply Contractors with high class Interior Fittings of all kinds.

Enquiries for Ontario and East should be addressed to
LICKLEYS Limited,
Mail Bldg., Toronto

For Winnipeg and District,
J. MALCOLM SUTTIE,
Travellers Bldg.
Winnipeg

For British Columbia,
E. V. ALBURTY & CO.,
Dominion Trust
Bldg., Vancouver

Roman Stone

(Trade Mark Registered)

is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED

All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low - Quality is High

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North 2107

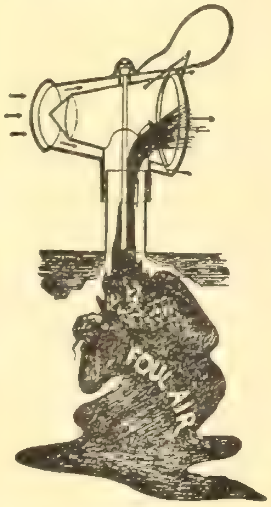
Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

AUTOFORCE VENTILATING SYSTEM



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

Sole Licensees and Manufacturers for Canada

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.
Telephone Main 159

American Sewer Pipe Co.

General Offices: Akron, Ohio, U.S.A.

We can serve you best. Our prices are right. The quality of our goods is of the highest excellence. We are the largest manufacturers of **Vitrified Salt Glazed Sanitary Sewer Pipe** in the world. Sizes, 3 in., 4 in., 5 in., 6 in., 8 in., 9 in., 10 in., 12 in., 15 in., 18 in., 20 in., 22 in., 24 in., 27 in., 30 in., 33 in., 36 in., 42 in. Lengths, 2 to 3 ft. Socket, Standard or Deep and Wide. Thickness in sizes 15 in., to 42 in., both Standard and Double Strength; We also manufacture Flue Lining, Wall Coping, Vitrified Conduit, Vitrified Curb, Paving Blocks, Drain Tile, etc.

Send for Catalogue.

201 Devonshire St., Boston, Mass.

House Trim, Doors, Etc.
in
Chestnut, Pine, Hardwood

Our prices are based upon small profits and always represent full value. Small orders at low prices are invited.

The Tillson Company
Limited
Tillsonburg - Ontario

The
Willson Portable Flare Light

Good contractors know that it always pays to get the best appliances.
The Willison Portable Flare Light, which is specially adapted for use in all kinds of construction work, cannot be beaten in efficiency or cost. Think of it, this light gives a candle power of 8,000 at a cost of less than six cents an hour.

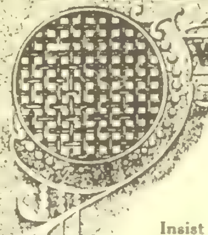
International Marine & Signal Co.
Limited
OTTAWA - CANADA

The Original
MARSH-PAUL
AIR VALVE
Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture —also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St.
CHICAGO, ILL.
Established 1865



ORNAMENTAL
IRON WORK
WIRE CLOTH AND
WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our
WINDOW GUARDS
Insist on having HARD STEEL WIRE
WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

SATINETTE

When an Architect specifies Satinette he desires to enhance and protect the beauty of his design

When a Contractor recommends Satinette he shows his good taste

"Satinette"—the enamel that never turns yellow—is the most perfect and durable white enamel ever made.

"Satinette"—is suited for decorative work of every description—Gloss Interior and Flat Interior for interior work and Gloss Exterior for all exterior work.

"Satinette" is always in evidence where elegance is of primary importance.

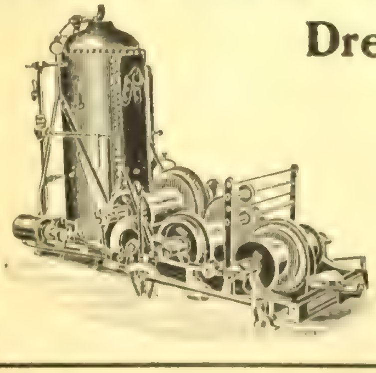
"Satinette" makes an artistic, durable and Sanitary covering for house decoration.

Like all Standard Products "Satinette" is the result of **much thought** and **experience and is now the most popular enamel finish** on the market.

All Standard Products are sold in full Imperial Measure Cans and manufactured by

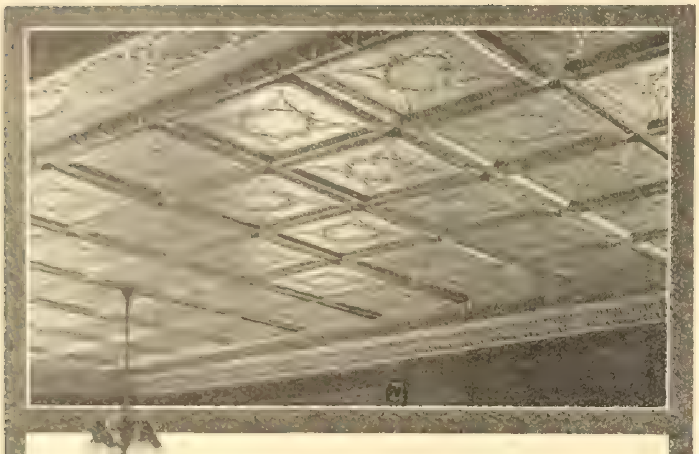
International Varnish Co., Limited
TORONTO WINNIPEG

M. Beatty & Sons, Limited
Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery



WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superioity** and faithfulness to art in styles they typify.

Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

Another reason for the phenomenal Herringbone sales

Because Herringbone Lath is not Wasted in lap

Best because it goes farthest

The Herringbone sheet which is 8 feet 1½ inches long is billed as 8 feet 0 inches.

The additional 1½ inches means one row of end staples for two sheets.

It means 2½ inches possible error in location of end stud without waste of lath.

Herringbone lath measured erected shows the full quantity invoiced.

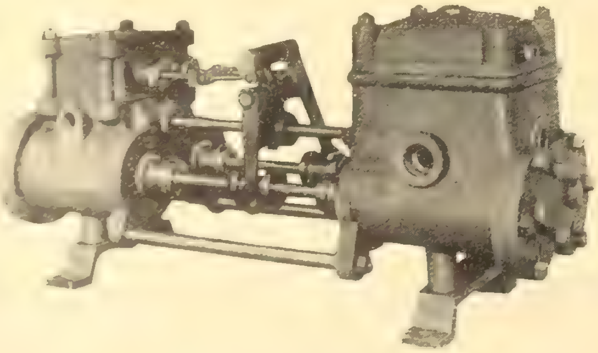
It also makes wiring of adjacent sheets between studs unnecessary.

The Herringbone interlocking selvage edge eliminates side lap.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.

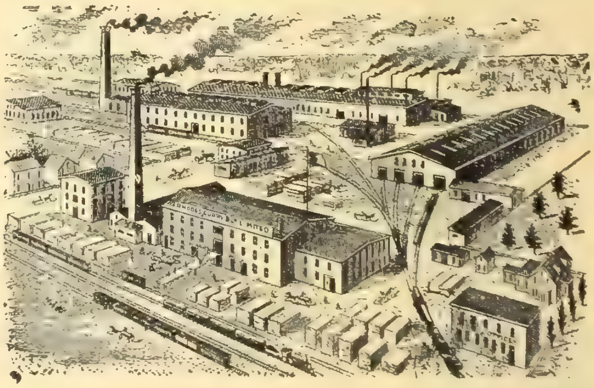


The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

Rhodes, Curry Co., Limited
Lessees



Bank and Office Fittings

SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

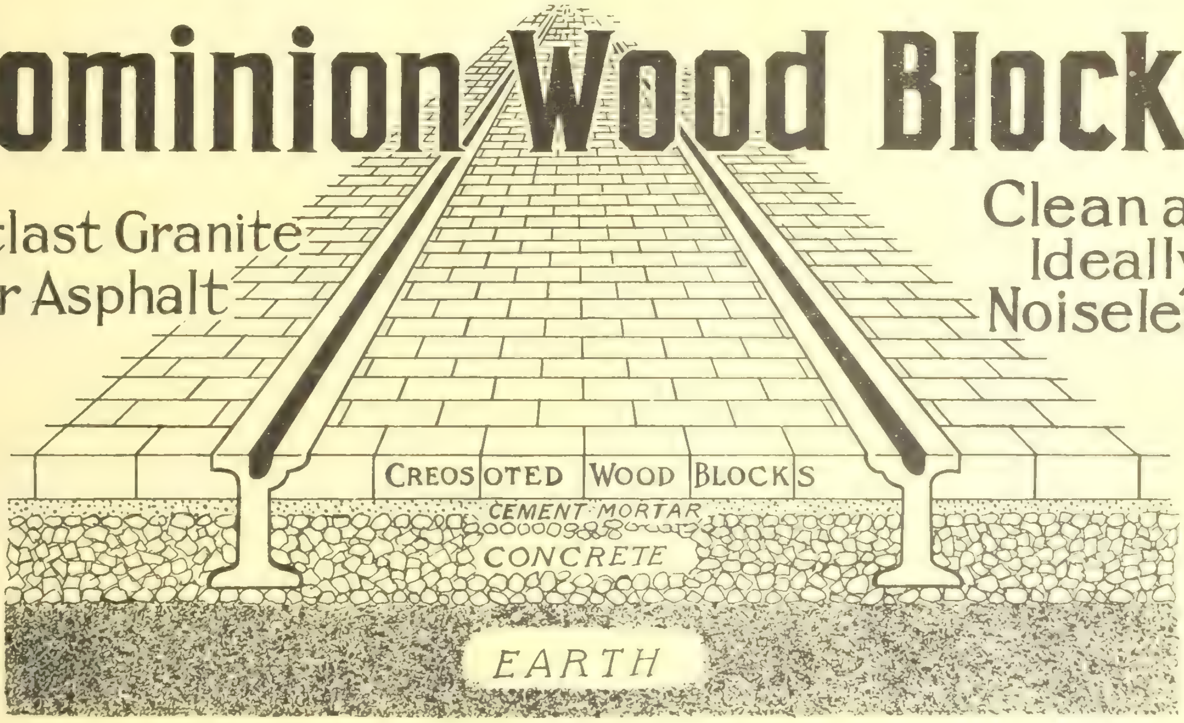
In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N.S.
BRANCHES AT
Halifax Sydney

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



THE IDEAL PAVEMENT

Dominion Creosoted Wood Blocks are recognized as the ideal material for pavement construction.

THE REASON WHY

They are not affected by extremes of temperature

They are easily cleaned.

Can be laid by unskilled labor with ordinary tools.

Parts of the pavement may easily be taken up in order to effect water, sewer and gas connections and relaid so perfectly that the junctions cannot be discerned.

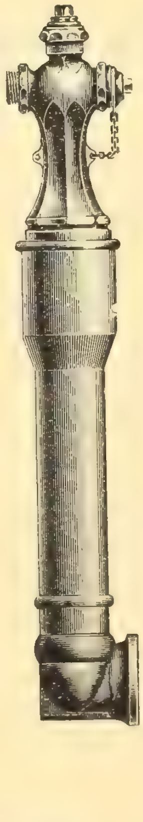
Dominion Creosoted Wood Blocks are made from close grained Douglas Fir of first growth, the best the market affords. There is no better material for the purpose than Douglas Fir; if there were, we would use it.

Dominion Carbolineum Works LIMITED
Vancouver, B.C.

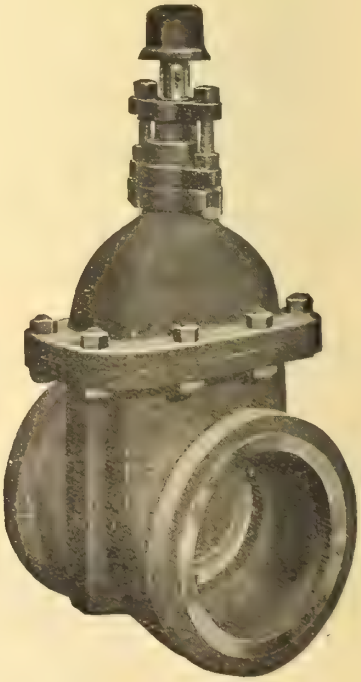
KERR

Valves and Hydrants

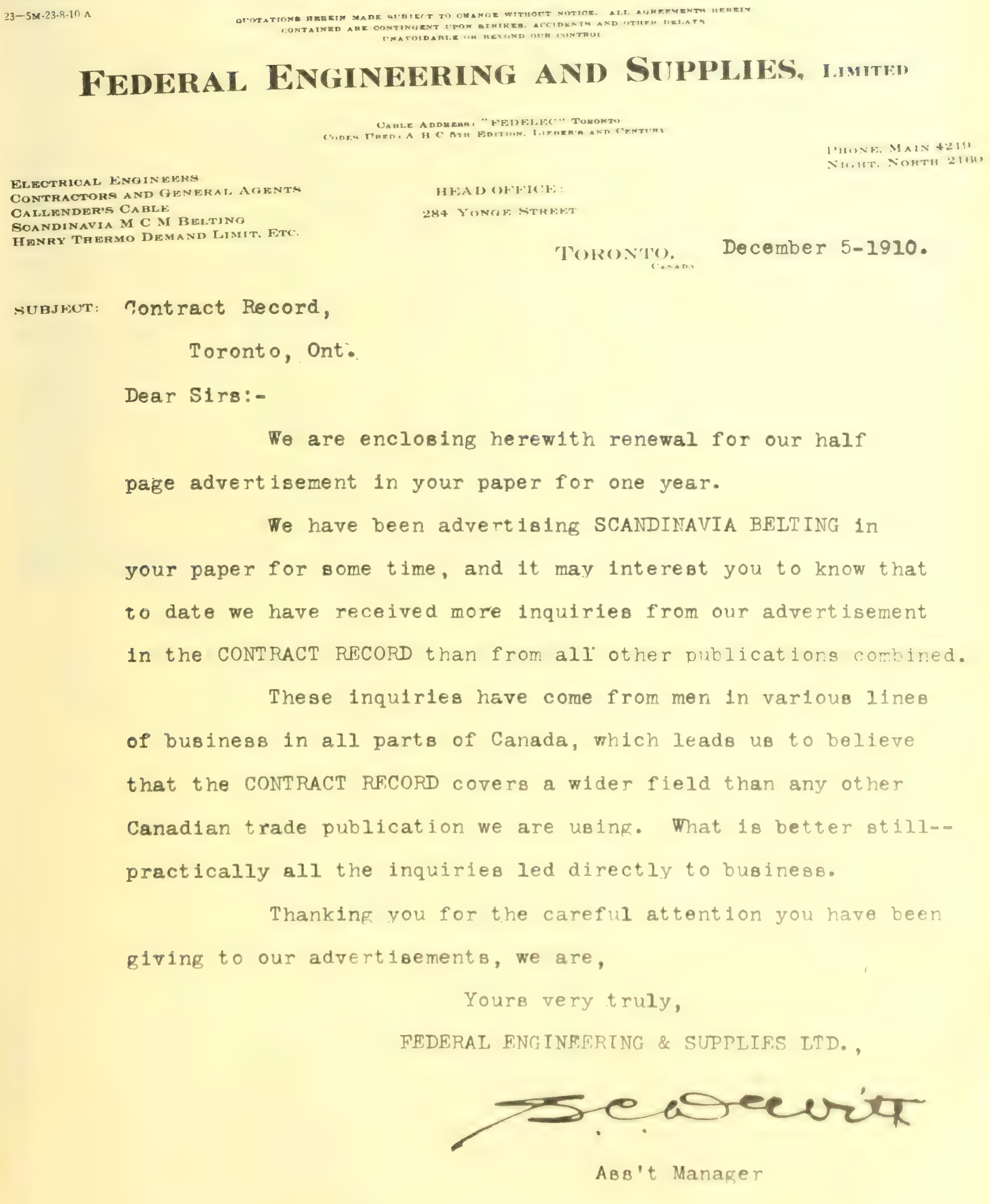
are used by cities and towns in every part of the Dominion. They have a reputation built up by years of long and satisfactory service. YOUR municipality should specify "KERR" for all waterworks' contracts.



Unsurpassed in
Workmanship
Design
Material
Efficiency



THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.



23—5M-23-8-10 A

QUOTATIONS HEREIN MADE SUBJECT TO CHANGE WITHOUT NOTICE. ALL AGREEMENTS HEREIN
CONTAINED ARE CONTINGENT UPON STRIKES, ACCIDENTS AND OTHER DELAYS
UNAVOIDABLE OR BEYOND OUR CONTROL

FEDERAL ENGINEERING AND SUPPLIES, LIMITED

CABLE ADDRESS: "FEDELEC" TORONTO
CODES USED: A B C 5TH EDITION, LIEBER'S AND CENTURY

PHONE, MAIN 4219
NIGHT, NORTH 2160

ELECTRICAL ENGINEERS
CONTRACTORS AND GENERAL AGENTS
CALLENDER'S CABLE
SCANDINAVIA M C M BELTING
HENRY THERMO DEMAND LIMIT, ETC.

HEAD OFFICE:
284 YONGE STREET

TORONTO,
CANADA

December 5-1910.

SUBJECT: Contract Record,

Toronto, Ont.

Dear Sirs:-

We are enclosing herewith renewal for our half page advertisement in your paper for one year.

We have been advertising SCANDINAVIA BELTING in your paper for some time, and it may interest you to know that to date we have received more inquiries from our advertisement in the CONTRACT RECORD than from all other publications combined.

These inquiries have come from men in various lines of business in all parts of Canada, which leads us to believe that the CONTRACT RECORD covers a wider field than any other Canadian trade publication we are using. What is better still--practically all the inquiries led directly to business.

Thanking you for the careful attention you have been giving to our advertisements, we are,

Yours very truly,

FEDERAL ENGINEERING & SUPPLIES LTD.,

Ass't Manager

The Hamilton Steel & Iron Co.
Hamilton - Canada
Limited

Rounds, Squares,
Twisted Squares,
Maxwell
Deformed Bar

Bar Iron
Pig Iron
Forgings
R.R. Splice Bars
Tie Plates, Spikes, Axles

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILES, CRESTING, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

For

Fire and Furnace Purposes

there are no better bricks than

GLENBOIG or GARTCOSH

Brands

For Building Purposes

where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb, 13 St. John St.
Montreal

London Automatic Batch Concrete Mixers

Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save you Money
On the first cost of machine
On cost of operation
On cost of mixing concrete

OUR AUTOMATIC MACHINES do perfect measuring and mixing of any kind **of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired

We also manufacture a STANDARD DRUM BATCH MIXER in four sizes, 7 ft. 10 ft., 20 ft. and 30 ft. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

"Empire Brand"

ensures a perfectly smooth hardwood floor which will be "a thing of beauty and a joy forever." If you want your clients to speak of you as "a fellow who always uses the best materials obtainable," specify

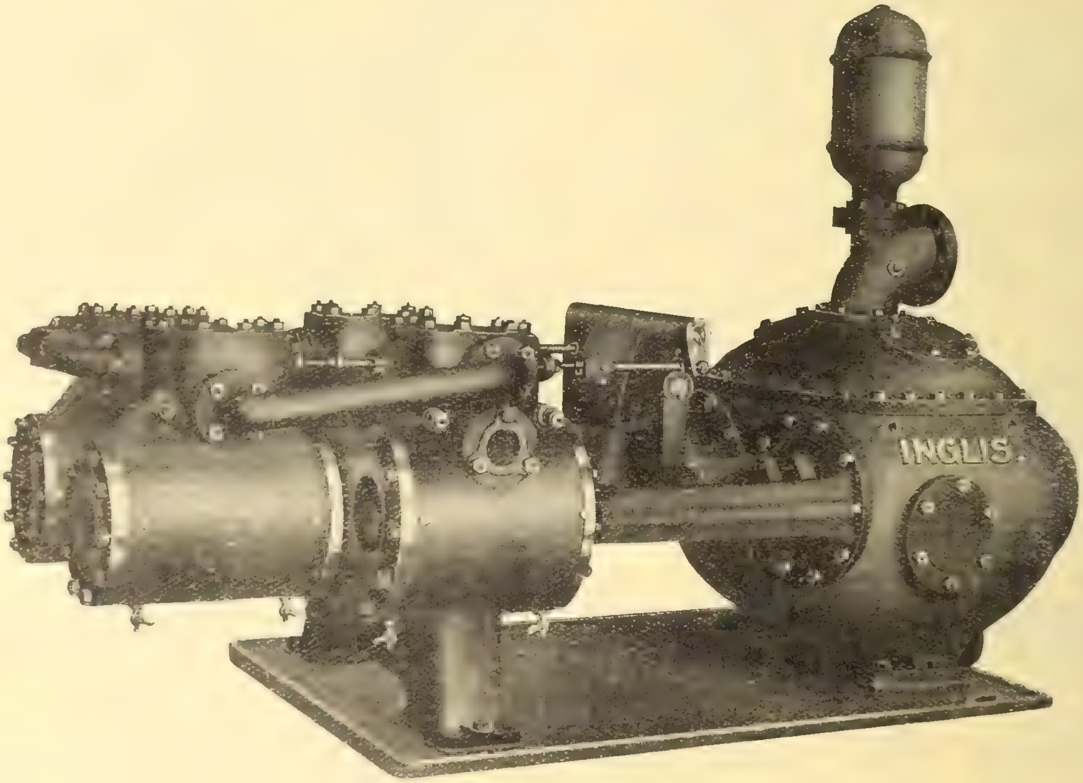
"Empire" Brand

every time.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent
The Hardwood Flooring Co., 55 St. Francois [illegible]

PUMPING MACHINERY



Compound Duplex Direct Acting Pumping Engine

We build Pumping machinery of all kinds and for all requirements. Experience should be considered when installing a pumping plant. We have built a great many throughout Canada and will gladly refer any corporation who are prospective purchasers to cities, where our pumps are operating and giving entire satisfaction. Built in sizes from one to thirty million gallons per twenty four hours.

Write us for photos and particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS Limited

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Carlyle, Sask.
The laying of cement sidewalks, because of the excavating for water pipes, will be postponed until the spring.

Chilliwack, B.C.
The by-law to expropriate 6 feet off the Dominion Hotel property for widening of Young street was defeated.

Elora, Ont.
The ratepayers will vote at the next municipal elections on a by-law authorizing the borrowing of $5,000 for construction of sidewalks. Henry Clarke, clerk.

Harriston, Ont.
The ratepayers will vote on a by-law to expend $35,000 to instal a waterworks system.

Lethbridge, Alta.
The city is having plans prepared for the construction of a gravity waterworks system from St. Mary's river, a distance of 35 miles. Estimated cost, $700,000.

Meaford, Ont.
The ratepayers will vote at the municipal election on the borrowing of $10,000 to be expended on the improvement of the streets.

Montreal, Que.
Superintendent Janin in his report endorses the estimates as prepared by Hering & Fuller, of New York, N.Y., for the proposed new aqueduct and other water supply improvements. The work as proposed includes the following: Construction of filtration plant, $1,687,000; completion of enlarging aqueduct now in course of construction, $675,000; to purchase 7,000 extra h.p., of which 3,000 to pump 50,000,000 gallons more and 3,000 h.p. for other municipal purposes—enlargement of aqueduct, $1,900,000; enlargement of tail race, $50,000; machinery, turbines, pumps, etc., $250,000, and building, foundations, weirs, etc., $100,000.

North Vancouver, B.C.
Two by-laws are likely to be introduced for the decision of district voters in January. One will be for $30,000 for road improvements and the other for about $1[illegible],000 for sidewalks.

Port Hope, Ont.
A by-law will be submitted to the ratepayers at the next municipal elections to authorize the issue of debentures for the sum of $13,000 for construction of cement walks, etc. J. W. Sanders, clerk.

Prince Albert, Sask.
The ratepayers will vote on by-law to spend $40,000 on granolithic walks; $48,000 on sewers.

Smith's Falls, Ont.
The ratepayers will vote on a by-law to borrow the sum of $10,000 to purchase a pump and a turbine water wheel to be installed in pumping station.

Victoria, B.C.
W. W. Northcott was authorized to call for tenders for various projects which have been decided on in connection with a large number of streets.

Vancouver, B.C.
The ratepayers will vote on by-laws for waterworks in city extensions, $200,000; on waterworks, north shore extensions, $200,000; Clark drive improvements, $75,000; opening and rough-grading of lanes, $50,000; extension of 8th avenue at Main street, $46,000.

Tenders were ordered to be called for the block paving of Pender street from Main street to Campbell avenue.

Wingham, Ont.
On Jan. 2nd the ratepayers will vote on a by-law to issue $2,500 5 per cent., 20 instalment sewage debentures.

Winnipeg, Man.
Tenders addressed to the chairman, Board of Control, will be received until December 28th for supply of water meters, as follows: 10 2-inch; 22 1½-inch, etc. Specification, etc., at office of City Engineer, 233 James avenue; also until same date for construction of water mains on several streets.

Tenders addressed to the Chairman, Board of Control, will be received until December 23rd for construction of water mains on various streets. M. Peterson, secretary.

AWARDED.

Point Grey, B.C.
Messrs. McLean & Company have the contract for construction of reservoir here, $58,000 approximately. Messrs. Cleveland & Cameron, engineers.

Vancouver, B.C.
The Paterson Contracting Company refusing to fulfil its tender for paving of Richards street from Georgia to Robson, the work was awarded to M. P. Cotton, next lowest.

Railroads, Bridges and Wharves trial Plants

Calgary, Alta.
We are informed that no tenders were [illegible] for the construction of steel bridges, for which tenders were to be in by Nov. 7th. New plans will be prepared. J. T. Child, city engineer; W. D. Spence, city clerk.

Edmonton, Alta.
The construction of a bridge is under consideration. A. J. Latornell, city engineer.

Fort William, Ont.
Permit was issued the C. P. R. [illegible] bridge recently, [illegible].

Kamloops, B.C.
Mayor Robinson and the city council will shortly present a proposition to the Canadian Northern Railway in regard to the extension of the line into that city. T. G. Holt and T. H. White represent the company.

Ottawa, Ont.
Tenders addressed to P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, will be received until Jan. 24th for about 61,200 gross tons of 80-pound steel rails and the necessary rail fastenings.

Prince Rupert, B.C.
Surveys for a railroad line between Port Simpson and Prince Rupert by the Port Simpson, Prince Rupert & Northern Short Line, are in progress and the management states that the line will be completed in two years. The line is of standard gauge.

Tenders addressed to Minister of Public Works, Victoria, will be received until Jan. 2nd for erection of Prince Rupert wharf. Plans, etc., at offices of the Government agents, Prince Rupert; of the Provincial Timber Inspector, Vancouver, and at the Public Works Department.

Port Mann, B.C.
The last link in the proposed route of the Canadian Northern Railway from Lytton to Port Mann has been finally surveyed. Mr. W. K. Gwyer finished work on the survey revision between Popkin and Hope. The section from Hope to Lytton was completed some time ago, and if any alterations are made there they will be slight. It is announced that the contract for the preparatory construction from Popkin to Hope, some 20 miles, will be let as soon as the season opens in the spring. By that time revised surveys from Lytton to Kamloops, and on up the North Thompson will be completed to permit of other contracts being awarded on this portion of the line.

Renfrew, Ont.
A by-law to raise by way of loan $2,500 for the purpose of constructing bridge across Smith's Creek will be voted on at the municipal elections.

Seaforth, Ont.
D. Patterson, county engineer, reports the necessity for either new bridges or considerable repair work in this district.

Trail, B.C.
The wash borings of the bed of the Columbia river taken in connection with the proposed erection of the large steel bridge [illegible] have been completed and are at Public Works Department. Plans are being prepared for concrete foundations. F. C. Gamble, Public Works engineer.

Victoria, B.C.
[illegible] of the Canadian Northern Pacific on Vancouver Island have been filed by Divisional Engineer [illegible] with the Hon. W. R. Ross, Provincial Minister of Lands. The plans [illegible] to Cooper Cove. The location of the new

[illegible] as shown by the plans does not in[illegible] any exceptional engineering diffi[illegible], there being no deep ravines to be [illegible] or mountains of a formidable character to be subjugated. The plans, [illegible] railway law, must be filed thirty days for inspection.

Vancouver, B.C.
The ratepayers will vote on the following by-laws: Burrard street, Kitsilano bridge, $500,000; Dunsmuir-Keefer viaduct, $400,000; Second Narrows bridge stock, $200,000.

AWARDED.

Belleville, Ont.
The contract for building the cement piers on the C.N.R. bridge across the Trent river has been let to Mr. Henderson.

Public Buildings, Churches, Schools, etc.

Brampton, Ont.
The county of Peel have under contemplation the erection of a hospital to cost not less than $30,000. The Women's Peel County Institute initiated the movement. Mrs. E. G. Graham, president.

Chilliwack, B.C.
The by-law to raise the additional $6,000 for city hall was carried.

Collingwood, Ont.
The ratepayers will vote at the municipal elections on a by-law to raise by debentures the sum of $14,000 for the purpose of erecting a fire hall.

Calgary, Alta.
Tenders for new schools will close on the 16th of January. Tenders to be sent to the secretary of the Calgary School Board. Noted previously.

Carcross, Yukon Territory.
Tenders addressed to J. D. McLean, secretary, Department of Indian Affairs, Ottawa, will be received until February 26, 1911, for erection of frame boarding school building near here. Plans, etc., at offices of the Inspector of Indian Agencies, Vancouver, Victoria, R. C. Miller, Whitehorse, Y. T., etc.

Edmonton, Alta.
The estimates for public buildings in the Province of Alberta include $515,000 for partial completion of new Parliament Buildings, $140,000 to complete the new court house, $50,000 for a site and building for new land titles building and $30,000 towards the construction of new government house in Glenora.

Hamilton, Ont.
The county council have accepted the plans of Stewart McPhie for the House of Refuge. Plans call for expenditure of $24,000. Work of erection, it is stated, will commence in the spring.

Kamloops, B.C.
The construction of the new provincial home for the aged here, will, it is stated, begin in the spring, the expenditure involved being about $70,000. Estimated total cost, $250,000.

The site for the new hospital has been chosen and final plans will be prepared at once. Estimated expenditure, $70,000. Hospital committee: Messrs. Bethune (chairman), F. E. Simpson (secretary), and others.

Listowel ,Ont.
The plans for public building are on view. Estimate provides $13,000 for erection.

Moose Jaw, Sask.
The town council has made the necessary guarantee to provide for the erection of a $50,000 Carnegie library building, which will be erected if Mr. Carnegie will receipt the proposition.

Montreal, Que.
Plans are being prepared for a new moving picture theatre on Notre Dame east.

The Board of Control have taken into serious consideration the need of a new city hall.

North Vancouver, B.C.
The plans prepared by Hope & Baker, architects, Vancouver, for the proposed new fire hall at Thirteenth and St. Georges avenues, have been accepted. Estimated cost, $8,000.

Ottawa, Ont.
The Belcourt Club, of which Dr. Chevrier is president, is preparing to erect a modern hall.

Tenders addressed to the secretary of Militia Council, Ottawa, will be received until Dec. 23rd, for the construction of a magazine building, etc. Eugene Fiset, colonel, Deputy Minister, Department of Militia and Defence.

Pakenham, Ont.
On January 2nd a by-law will be voted to authorize the issue of debentures, Tp. of Pakenham, to the amount of $4,000, for the purpose of building a hall.

Phoenix, B.C.
The congregation of St. Andrew's Presbyterian church will erect a church to replace the one recently destroyed by fire.

St. Paul, Man.
On Dec. 29th a by-law will be voted on to issue $6,000 school debentures. Alfred Masters, secretary-treasurer.

Saskatoon, Sask.
The congregations of Wesley Church, Third Avenue Methodist, and St. John's, will build new churches during 1911.

St. John, N.B.
Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until January 9th for construction of drill hall here. Plans, etc., at above Department and on application to Mr. D. H. Waterbury, Supt. of Public Buildings, this city.

Victoria, B.C.
Bids for the alterations of and extensions to the isolation hospital were as follows: Messrs. Parfitt Bros., $20,051.60, or if Rockolith flooring is used $3,303 additional; Woodworkers', Limited, $18,622, with Rockolith, $4,403 additional; Messrs. Knott & Jones, $17,723, with Rockolith flooring, $2,739 additional. Referred to purchasing agent, W. M. Northcott.

Vancouver, B.C.
The architect and contractor in charge of the erection of "Avenue Theatre," corner of Westminster avenue and Harris street, is Mr. G. B. Purvis.

The First Presbyterian Church, southeast corner of Hastings street and Gore avenue, has been sold for $150,000. This will materially enable the congregation to carry out their intention of erecting a church on Pender street east on the expiration of the year's lease.

The time for receiving tenders for submitting competitive plans for refreshment pavilion, animal buildings, and improvements to grounds at Coal Harbor entrance, Stanley Park, has been extended to Jan. 1st. Address, Secretary, Park Board, City Hall.

The council finally decided to submit the following by-laws for public buildings: School by-law, general purposes, $572,000; Britannia and King Edward schools, $295,000; sites for additional schools, $100,000; total, $967,000. General Hospital, addition, $240,000; exhibition purposes, $115,000; General Hospital additional site, $29,500; city morgue, $25,500; additional fire hall, wards 3, 5 and 6.

Wetaskiwin, Alta.
Mr. R. M. Angus will start at once on the erection of the new theatre (capacity, over 1,000).

Warren, Man.
The trustees of the consolidated school district have the authority to erect the new school here.

Winnipeg, Man.
Competitive plans for the erection of infectious hospital will be called after the approval of the Board of Control. Estimated cost, $200,000.

Permits were issued to W. O. Edmunds, for theatre, Portage avenue, $30,000; Avenue Theatre Company, theatre, $15,000.

Tenders addressed to the chairman, Board of Control, will be received until January 6th for supply and erection of steel cells for the two police sub-stations now in course of erection. Plan, etc., with Inspector of Buildings. M. Peterson, secretary.

AWARDED.

Cranbrook, B.C.
Tenders for the new city hall were as follows: W. R. Beattie, $14,000; Geo. Leask, $15,320 (accepted). Consideration was shown the latter because of the original contract being awarded to him which was cancelled when the Board of Trade requested the hall to be of brick.

Megantic, Que.
The contract for erection of Knox Presbyterian Church was awarded to Messrs. Fagnet & Godbout, of St. Hyacinthe.

Ottawa, Ont.
The Pease Furnace Company has been awarded the heating for the Westboro public school.

The contracts awarded recently by the Dominion Public Works Department are: Grand Falls, N.B., new public building, of stone and brick, to Powers & Brewer, of Grand Falls, for $17,774; Nanaimo, B.C., addition to public building, of stone, to Alex. Henderson, of Nanaimo, for $23,441; South Ingonish, N.S., wharf extension, to Robert Mosgorve and Bart Mosgrove, of North Sidney, N.S., for $5,100; Birkshead, N.S., breakwater, to A. W. Girroir and Sweet, of Antigonish, N.S., for $35,490.

Victoria, B.C.
The contract for Isolation Hospital, we are informed, has been awarded to Knott & Jones, Victoria, total, $20,462.

The contract for addition to the Victoria West school was awarded to Messrs. Luny Bros, $17,600, the lowest.

Residences

South Vancouver, B.C.
Work will be started shortly on the erection of six dwelling houses which Mr. J. C. Hudson will build on Martha street. The buildings to plan, will cost $3,000 each, or over.

Plans for a six-storey apartment house

were recently presented by Mr. P. Tardiff. The block is to be located at the corner of Comox and Broughton streets and will cost $100,000.

Vancouver, B.C.

Mr. G. E. Greneson took out a permit for a 6-storey apartment house at 652 Jervis street, $120,000. A permit for another apartment house was taken out by Mr. E. W. MacLean, corner of Burrard and Pender streets. At present it will be only two storeys in height, but the plans provide for additional storeys at a later date. Initial outlay, building, $50,000.

AWARDED.

Victoria, B.C.

Nelson, Benneck & Sons have secured the contract for the erection of a residence for Duncan Ross on Rockland avenue. James & James are the architects.

Business Buildings and Industrial Plants

Blyth, Ont.

The Kelly block here was destroyed on the 19th inst. Loss about $15,000. Among the losers are Dr. Perdue, W. Bently and others.

Dauphin, Man.

The hardware store owned by A. R. Macpherson was destroyed by fire on the [illegible] inst. Loss, $25,000.

Edmonton, Alta.

Building permits were issued to Hudson Bay Company, elevator, $8,000; J. A. Pitch, 116 Sinclair street, store, etc., $3,000.

The property owned by Robert Tegler has been purchased by a Toronto capitalist, it is said, who will erect a 6-storey block to be ready for occupancy by September, 1911.

H. H. Macdonald, of Fairbank, Alaska, has purchased lot 64, block 6, H.B.R., where it is stated a business block will be erected. Seton Smith & Company effected the sale.

Fort Frances, Ont.

Mr. Backus has asked the Government for more land between Front street and the river on which to build a paper mill. Mr. J. F. Whitson, of Crown Lands Department, will report. Prepared plans call for a paper mill of from 140 to 150 tons daily capacity.

Fort William, Ont.

C. R. Hosmer, director of the Canadian Pacific Railway Company, and the Bank of Montreal; F. W. Thompson, director of the Ogilvie Flour Mills Company, and S. Holt, president of the Royal Bank and of the Montreal Light, Heat & Power Company, have formed a new steel company, which will establish a plant here to manufacture wire and nails. Arrangements have been completed to purchase the necessary materials from the Lake Superior Corporation.

Galetta, Ont.

It is stated the Canadian Cooperage Company will start the factory here for another season.

Gananoque, Ont.

A by-law to assist the Ontario Wheel Company in the re-erection of their plant will be submitted to the ratepayers at the next municipal elections. S. McCammon, clerk.

Halifax, N.S.

The council have granted the civic concessions to the Nova Scotia Car Works, Limited, purchasers of the Silliker Car Company. It is stated that extensions will be made.

Hamilton, Ont.

The Dominion Power & Transmission Company will spend about $100,000 on new sub-stations, it is stated, in this city. W. C. Hawkins, general manager.

London, Ont.

It is reported that the McLaughlin Manufacturing Company, of Oshawa, will erect here a garage and warehouse. Estimated cost, $40,000.

Michel, B.C.

It is rumored that a large modern hotel will be built on the island opposite the Rock Cut. The C. P. R. are said to be back of the project.

Moose Jaw, Sask.

The proposition to erect a first-class hotel here has taken shape. Mr. J. P. O'Leary, representing Brown & Vallance, architects, Montreal, Que., is stated to have offered to build an up-to-date hotel, cost $250,000, provided a lease is taken for ten years, etc. Board of Trade president, Mr. R. Loney.

Montreal, Que.

The Colonial Real Estate Company (Jas. Morgan, Rep.), will erect next spring an 8-storey office building, costing $300,000.

The plans for the new building to be constructed on Craig street by the City Furnishing Company are now complete and contracts will be asked for shortly.

New Westminster, B.C.

The B. C. E. Railway have purchased a 5-acre block on Young street as the site for combined freight and passenger depot.

Ottawa, Ont.

Leon Petergorski will erect stores on the corner of Somerset and LeBreton streets.

Negotiations are in progress between an iron and steel manufactury with a sub-committee of the publicity department, which includes Mayor Hopewell, Stewart McClenaghan and others, with a view to locating here.

Port Hope, Ont.

At the municipal elections the ratepayers will vote on the by-law to grant exemption to the International Tool Steel Company.

Prince Albert, Sask.

Mr. Locke, of Vancouver, will erect a business block here.

Quebec, Que.

A. M. A. Beaulieu received permit to construct a three storey building at the corner of St. Vaner and Paul streets, $6,000. Messrs. Jinchereau & Lamonds, contractors.

Regina, Sask.

Storey & Van Egmond, architects, are calling for tenders for a brick warehouse at Regina, for Messrs. [illegible] and Nellermoe. The work will not be started until the weather permits in the spring.

Saskatoon, Sask.

[illegible] have purchased the [illegible] Block on Second avenue and will enlarge it next spring.

Sydney, N.S.

Arrangements have been made, it is stated, between the Dominion Steel Corporation, Limited, and the firm of Alexander Cross & Sons, Limited, Glasgow, Scotland, for the establishment of the fertilized industry which has been under consideration. Tenders for construction of plant will be called as soon as engineer arrives. President of Dominion Steel Corporation, J. H. Plummer.

Victoria, B.C.

Kelly, Douglass Company, Limited, of Vancouver, expect to have their warehouse ready by April next. Site chosen on Wharf street.

Tenders were called until December 17th for erection of brick office building, plumbing and heating included, for P. R. Brown. H. S. Griffith, architect, 1006 Government steret.

Vancouver, B.C.

The G. N. R. have plans filed for erection of passenger station here on the north shore basin, head of False creek.

Plans were submitted for extension of Hotel Vancouver, $300,000; application has been made for erection of 4-storey building on Homer street for Mr. J. Ollason.

Plans have been prepared by Gould & Champney for the erection of 10-storey block, Granville and Pender streets, for Mr. Jonathan Rogers. Estimated expenditure, $500,000.

Tenders were called until December 20th for erection of new warehouse for Kelly, Douglas & Company, Limited. Plans, etc., at office of Gardiner & Gardiner, architects, Westminster Trust Block, New Westminster.

The Canadian Fishing Company presented plans for the large cold storage plant which it is proposed to erect on the Inlet waterfront. This undertaking will represent an expenditure of $150,000.

The Lester W. David Company are carrying out their intention to establish a townsite, hotel, dam and wood pulp mill at Ocean Falls, on Cousin's Inlet. Already fifteen cottages have been built. Mr. Kelly, of the Northern Canstruction Company, is constructing the dam, which will be finished in the spring. The mill will have a capacity of 500,000 board feet per day. It is estimated the power furnished will be about 20,000 h.p. Acting manager, Mr. Robert E. Nevins; Lester W. David, president; Mr. Perry, New York, engineer of construction.

Woodstock, Ont.

[illegible] & Sons, of [illegible], Indiana, have opened negotiations with this city regarding the location of a motor factory. Ald. J. McBeath, president, Board of Trade. Proposed capitalization, $250,000.

Winnipeg, Man.

Tenders on prescribed forms, addressed to Chairman, Board of Control, will be received until December 29th for steel work, substation 1. Plans, etc., at office of the power engineers, Carnegie Library. M. [illegible], secretary.

Permit was issued to Manitoba Government [illegible]; also Canadian Bank of Commerce, $15,000,000.

AWARDED.

Port Hope, Ont.

Mr. [illegible] has secured the contract for the masonry of the Interntaional Tool Steel Company.

Sydney, N.S.

The Dominion Iron & Steel Company have given a contract to F. L. Dixon for [illegible].

Saskatoon, Sask.

W. D. Smith, of Watts & Company, has secured the contract for [illegible].

Tenders and For Sale Department

Tenders for Cement

Tenders will be received up to DECEMBER [illegible] for the supply of Cement during the year 1911.

Specifications and particulars furnished on application.

M. FERGUSON
City Engineer.
Stratford, Ont., Dec. 19 1910. 51-52

City of Winnipeg Power Development

Electric Generator Wanted

Proposals will be received at the office of the undersigned up to DECEMBER 23RD, 1910, for supply of direct current Electric Generator, new or second-hand, 50 K.W. Capacity, along with Steam Engine for direct connection or for belt driving.

M. PETERSON,
Secretary.
Board of Control Office,
Winnipeg, Dec. 7th, 1910. 50-51

Tenders Wanted

Sealed tenders addressed to the undersigned will be received up to SATURDAY, THE 21ST DAY OF JANUARY, 1911, for the several trades required in the erection and completion of an Agricultural Exhibition Building at the Town of Thornbury, Ont.

Plans and specifications can be seen at the Office of John Wilson, Architect, Collingwood, or at the Office of the Town Clerk, Thornbury.

The lowest or any tender not necessarily accepted.

EDWARD RORKE,
Town Clerk.
Thornbury, Dec. 9th, 1910. 50-51

Patent Rights for Sale

Take notice that the undersigned are prepared to supply, at a reasonable price sheet metal dumping cars for railroad contractors' use described in Canadian Patent No. 116297, or to grant anyone desiring to use the same a license to have the same manufactured for him at a manufacturing establishment in the Dominion of Canada. They are also prepared to receive offers for licenses to manufacture and sell under the same. Ridout & Maybee, Manning Chambers, Queen St. West, Toronto, attorneys for the Goodwin Car Company. 51-51

Railway Construction

Tenders will be received up to noon JANUARY 2ND, 1911, for the construction of the Roadbed and Structures of the following sections of the Manitoulin and North Shore Railway:—

Crean Hill, mile 22.7 west of Sudbury, to connection with present line at Espanola.

Espanola, south to a point at or near Mile 61.

Plans, profiles and specifications may be seen at the office of the chief engineer, Sault Ste. Marie, Ontario, at the offices of the "Canadian Engineer" at Montreal, Toronto or Winnipeg, and at the office of the "Railway & Marine World," Toronto.

All tenders addressed to R. S. McCormick, Chief Engineer Manitoulin and North Shore Railway, Sault Ste. Marie, Ontario.

The lowest or any tender not necessarily accepted. 51-52

City of Regina

Tenders for Power Plant

Tenders are asked for by the City of Regina for the supply and installation of any or all of the following, together with the necessary connections ready for operation:

1 1500 k.w. Steam Turbine Generating Unit.
1 500 k.w. D.C. Generating Unit.
2 500 Horse Power Boilers.
1 Economizer.
1 Hand Power Travelling Crane.
1 Coal and Ash Conveyer.

Tenders will be received for the above until 10 p.m., TUESDAY, JANUARY 17, 1911. Specifications and all information will be furnished on application to the undersigned or to E. W. Bull, City Electrician.

(Signed) A. J. McPHERSON,
City Commissioner.
51-2

Miscellaneous

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

A reliable and well established firm wish to represent for Manitoba a manufacturer of Canadian Concrete Mixers of reliability and moderate cost. Address Box 176 Contract Record, Toronto, Ont. 51-52

WANTED—HOISTING ENGINE with swing derrick complete, to lift about three-quarter yards earth. Address J. H. McKnight Construction Co., Limited, 152 Bay St., Toronto. 51-51

Cement in Refuse Disposal.

In slag making at the destructor works of the corporation of Kingston-on-Thames, the clinker removed from the destructors is converted into paving slabs in the following manner: It is first ground up to the necessary size, and is then mixed in the proportions of 2½ bushels of granite chippings, 4½ bushels of screened clinker and 2 bushels of Portland cement. The granite chippings and cement are gauged 4 to 1. The chippings and cement are first placed in the mould to a depth of 1-inch, and the mass is shaken about so as to cause the chippings to fall to the bottom, in order to give a good hard wearing surface. The rest of the mould is then filled with clinker and cement. One gauging, as given above, will make 32 feet super of 2-inch stone. The slabs are allowed to remain in the moulds for one week, in order to set, at the end of which time they are taken out and stacked in the open for from three to six months to mature. The moulds consist of wooden frames with a bottom of sheet zinc. Slabs of varying sizes are made, as also crossing blocks and gutter channels. By using granite chippings for the surface a very much more durable stone is produced, though, of course, the cost of production is increased. R. H. Clucas, the borough surveyor, estimates this to be from 2 shillings expense to 2 shillings 9 pence (60 to 66 cents) per square yard.

Graham Bros. & Company, lumber manufacturers and merchants, Kinmount, Ont., are stated to have assigned to George A. Jordan.

Unique Roof Truss for Library Building.

A noteworthy feature of the new library designed for the University of California by J. G. Howard, architect, is the main reading room, 210 feet long by 54 feet wide, with a maximum height of 45 feet. The profile of the ceiling, approximately elliptical, was struck from five centres. The roof principals are of somewhat unusual form, owing to architectural requirements governing the position and slope of the roof and the position of the curved ceiling. Although ample depth was secured at the middle of the principals, the distance between the ceiling and the outer surface was so small that the web was formed of steel plates so as to impart the requisite strength to the construction.

Moreover, to secure the maximum possible depth for the principals, the upper and lower flanges were spaced so that the purlins when rivetted in place should have their upper surface flush with the top of the principals, and that the beams carrying the ceiling supports should be flush with the bottom of the principals. Further lateral bracing was provided by lattice girders, 5 feet 1¾ inches deep, rivetted between the principals at the distance of 8 feet 11 inches from the centre line.

The principals measure 57 feet 4 inches from centre to centre of the supporting columns, and they are spaced apart at distances ranging from 15 feet to 30 feet the reason for variations being found in demands made by the architectural designs.

Fire Resistance of Bricks.

In the proceedings of the Engineers' Society of Western Pennsylvania particulars are given of experiments conducted on different classes of bricks. It was found that with mixtures of magnetite and marble with kaolin the refractoriness of the magnetite brick decreases as the amount of clay increases, and the same applies to the addition of lime. With mixtures of alumina and silica, additions of kaolin bring down the melting point of pure alumina considerably below the normal value of about 2,000 deg. C., and if quartz be added with 9.1 per cent. alumina the melting point is reduced to about 1.566 deg. C., after which a very small amount of alumina raises the melting point rapidly to 1,790 C.—the melting point of pure silica. In the case of a silica brick with a certain amount of clay introduced as a binder, it was found that as the amount of clay is increased the refractoriness rapidly falls off after the added amount reaches 6 per cent. This points to the desirability of making bricks either very high in silica or entirely of clay. Other investigations indicated the effect of potash, soda, lime, magnesia and iron on the melting point of clay. Slight additions of the fluxes named reduced the melting point, the reduction being proportionate to the quantities added.

The McQuin Lumber Company, Limited, Sussex, N.B., are applying for charter.

Imperial Dredging & Construction Co., Limited, Oromocto, Que., are applying for charter.

Power Plants, Electricity and Telephones

Arnprior, Ont.
A by-law will be submitted at the municipal elections to authorize the Galetta Electric Power & Milling Company, Limited, the power to supply this municipality electric power, and to provide for the issue of debentures for $6,000 for the purpose of making improvements in connection with waterworks system, etc.

Barrie, Ont.
This municipality is negotiating for the purchase of hydro-electirc power.

Brockville, Ont.
At a meeting called of the representatives of the eastern towns wishing to secure hydro-electric power, a union of those municipalities was formed. Mr. Elliott, of Kingston, was elected president, and Mr. Wm. Shearer, of Brockville, secretary.

Dundas, Ont.
On Jan. 2nd the ratepayers will vote upon a by-law to issue $12,000 5 per cent. 30 instalment Hydro-Electric debentures.

Edmonton, Alta.
The annual report of the telephone superintendent recommends the erection of sub-telephone stations in Norwood and the Groat estate.

Hamilton, Ont.
The Canadian Westinghouse will supply a new generator of 8,500 h.p. capacity for the Dominion Power & Transmission Company. Estimated cost, $200,000. Substations are also being built.

Listowel, Ont.
A by-law to authorize this municipality to borrow $5,000 to complete erection and installation of electric light works will be submitted.

Midland, Ont.
Deputations from Penetanguishene and this municipality have interviewed the Hydro-Electric Commission regarding the supply of electric energy.

Montreal, Que.
Tenders addressed to Board of Commissioners will be received until December 28th for supply of electrical supplies required for the fire alarm department. Information to be obtained from purchasing and sales agent in office of the above. L. N. Senecal, secretary.

The National Hydro-Electric Company of Montreal has been incorporated at one million dollars, and the powers are general. Incorporation is in the names of Arthur Surveyor, Royal Lesage, Marie A. Favreau, T. R. Chabot, and Louis Gosselin, all of Montreal.

Ottawa, Ont.
Sir Henry Bate, chairman of the Ottawa improvement commission, is arranging a conference with the electric, telegraph and telephone companies in order to come to some understanding whereby all the poles on the streets will be painted one color, as near the color of tree bark as possible.

Port Hope, Ont.
The council decided to submit the by-law of the Seymour Power Company re application for franchise in Port Hope on January 16th.

Toronto, Ont.
The issue of city of Toronto street railway debentures to the amount of $615,713 has been authorized.

Victoria, B.C.
Tenders will be called soon for 2,000 pounds of copper wire for city light department. W. M. Northcott, purchasing agent.

AWARDED.

Weston, Ont.
The contract for construction of transformer station and fire house has been awarded to George B. Moog, Berlin, $6,900.

Winnipeg, Man.
A contract for the supply of 47,000 telephone poles has been awarded to J. H. Hyland & Company, timber merchants, Winnipeg, by the Manitoba Government Telephone Commission.

Miscellaneous

Hamilton, Ont.
The following building permits have been issued: W. A. Noble, erection of two brick dwellings on Canada street, between Pearl and Ray streets, to cost $3,600; W. A. Noble, erection of two frame dwellings on Shaw street, between Victoria avenue and Emerald street, to cost $2,800.

Ottawa, Ont.
Among the building permits issued recently were: Patrick McKeown, shop and dwelling, $2,250; Exhibition Association building, Smith Bros., contractors, iron clad construction; Robert H. Turner, dwelling, Fentiman street, $2,550.

The village of Eastview will vote on a plebiscite in January with regard to the purchasing of fire fighting apparatus for the corporation.

Carleton County Council will not open the tenders for a new stone crusher until the January meeting.

Considerable repairing will be done to the Rideau Canal during the winter. The repair work is done by day labor and the new work by contract. All the work this year will be in the nature of repairs. A. T. Phillips, superintending engineer.

Quebec, Que.
Tenders addressed to J. Gallagher, waterworks engineer, will be received until January 3rd for 500 feet of rubber hose, 2½-inch diameter, 4-ply, in lengths of 50 feet, with couplings to fit local hydrants.

Victoria, B.C.
Tenders for additional equipment, fire engines, etc., will be called for at once by the fire wardens.

Recent building permits include: James Couch, dwelling on Princess street, to cost $2,000; Beaumont Boggs, two storey brick store building on Courtney street(to cost $3,700.

Vancouver, B.C.
Tenders were ordered to be called for another steam roller.

Tenders addressed to Wm. McQueen, city clerk, will be received until Dec. 30th for construction of launch to be used in connection with the new Isolation Hospital.

Building permits were granted as follows: D. Edwards, 1245 Pender street, $8,000; Sunset Sash & Door Company, [illegible] Broadway, [illegible]; H. [illegible], [illegible] street, $2,500; G. W. Robertson, 2007 Trafalgar road, two houses, $16,000; R. Band, 2619 Second avenue west, $7,000; D. J. McPhail, 561 Broadway, $7,000; D. McDonald, [illegible] Beach avenue, [illegible]; F. W. Hemphill, [illegible] Keefer street, [illegible]; [illegible] Glazed Cement Pipe Company, [illegible] Front street, $2,000; Bacon & Mugford, 1726 Twelfth avenue west, $4,500; Ellis & Clayton, 1618 Twelfth avenue, two houses, $3,000; Vancouver Furniture Manufacturing Company, 122 Dufferin street, $4,000; 000; Mr. J. C. Runkle, for a five storey J. Anderson, 1787 Eighth avenue east, $2,-brick block on Cordova street, $45,000; F. N. Trites, 1356 Albert street, $5,000; North Pacific Lumber Company, Thirteenth avenue, $2,000; E. Hughes, Eveleigh street, $2,500; J. B. Arthur, 2797 Alberta street, $6,000; Mr. Eastfelt, Second avenue, $2,-000; F. C. Copeland, 824 Twelfth avenue east, $2,500; C. W. Shannon, 1021 Fourteenth avenue east, $2,200.

Winnipeg, Man.
Recent building permits include: J. Sangster, two houses, west side of Ruby street, $7000; G. A. Harrison, two houses, north side of Tweed, $5,500; W. J. Atkinson, house, east side of Ashburn street; Robt. Lane, for the erection of a large frame structure on Fifteenth street, to be used as an ice house, $5,000.

AWARDED.

Dartmouth, N.S.
The tender of McKie & Baxter, Glasgow, Scotland, for the construction of a steel steamer according to plans and specifications with modifications suggested in the letter of October 1st for $60,750 be accepted. Four other tenders were opened as follows: John I. Thorncroft & Company, Limited, of Southampton, $102,060; Ailsa Shipbuilding Company, Limited, of Troon, for wood superstructure, $73,143, of steel superstructure, $65,100; Halifax Graving Dock agreed to build a steel steamer in Halifax for $89,900 or if built in England, $84,200; E. F. Williams, of Dartmouth, agreed to build a steamer, material wood, with fore and aft propellers, for $71,872.

Ottawa, Ont.
S. Coseline and James Fox were awarded the contracts for supplying stone to the county jail at $4 a tois.

Barrett Brothers were awarded the contract for wood for the county court house and jail at $5.40 a cord for hardwood and $2.75 a cord for softwood.

New Companies

Construction Works, Limited, Montreal, Que., incorporated; capital, $50,000. Incorporators: A. S. Archambault, avocat; P. J. Hubert, accountant, both of Montreal, Que.

Utilities, Ltd., Montreal, Que. Capital, $50,000. Incorporators, James Allen Williams, physician; George Ackland Gillies, engineer, both of Montreal, Que., and John Stark Gillies and David Armitage Gillies, lumberman, both of Braeside, Ont.

Dryden Timber & Power Co., Ltd., Dryden, Ont. Capital $3,000,000. Incorporators, Ephraim F. Singer, student at law; Frederick G. Waters and Herbert Mill, accountants, all of Toronto, Ont.

[illegible] Limited; incorpoarted; capital, $500,000. Incorporators: J. S. Hough, barrister; Chas. Williams and John Mahood, accountants, both of Winnipeg.

[illegible] Ltd., Bourget, Ont. Capital, $20,000. Incorporators [illegible] merchant, all of the county of Russell, Ont

[illegible] Limited, capital $1,000,000; incorporated Head office, Toronto. Incorporators: W. J. [illegible] manufacturer, Orillia.

Building Prospects at Ottawa

Government Work and Other Large Projects to be Started in the Spring—Market and General News

Ottawa, Dec. 17th, 1910.

While it is a little early to estimate the buildings of the larger variety to be erected next year, yet already a number of capitalists have been asking the opinions of their architects on various propositions which leads to the belief that outside the big works now in progress and the government work, there will be a great deal of commercial building again next summer. Bank street, which has been rapidly growing in importance as a commercial street, has made a great number of sales of property in the southern end during the past few weeks at prices nearing $200 a foot. Nearly all these are vacant properties and it is believed that a large number will be built on in the spring as the majority of the owners will not wish to hold them without revenue at such high prices. This will necessitate a very great deal of building of stores for which the present seems an opportune time. Of the mile of shops along Bank there is claimed to be not one vacant. In fact, throughout the city there are very few vacant stores and with the exceptionally good fall trade there is great encouragement for more of this kind of building.

It is given out as practically definite that the big Governmental departmental building will go ahead as early as possible in the spring, and the construction of a plaza joining Dufferin and Sappers bridge will be begun very soon.

Mr. Patrick Labelle has about completed the construction of 18 flats on the corner of Metcalfe and Gilmour streets, at a cost of $40,000, and is now one of the movers in a proposal to form a company for the purpose of erecting a $100,000 apartment house on the corner of Somerset and Cartier streets. It will be an eight-storey building of reinforced concrete, fireproof.

Just now there is a slackness in some of the trades such as carpentering. However, painters and decorators are surprisingly busy for winter. It is almost entirely improving residences that have been built for some time. Paints have been quite stiff in price all the summer and more so during the past few months. Paint oil and white lead advanced steadily governing the price of other paints. However, there has been a slight drop in these very recently. Paint oil is selling at $1.12 a gal. by the barrel and $1.17 in smaller quantities, while lead is selling at 6 cents for the best.

It is expected that steel for construction will be a little dearer next year. While the price quoted in the capital this summer was $2.75 a cwt., there was considerable cutting from that quotation. However, the dealers and agents state that after Jan. 1st there will be no selling under that figure.

Until the past few days the fall was a favorable one for brick work, and the brick manufacturers state that the demand since Nov. 1st has been greater than the year before.

There is a slackness for team work and therefore for the past few weeks the teams and driver could be engaged at a lower rate than any time during the past summer. During the summer they ranged closely around $4.50 a day, while now they are available at under $4. This is chiefly because of the unsatisfactory condition of the roads for heavy work.

The painters union will ask the master painters to sign an agreement for a minimum wage of 30 cents an hour to become operative on April 15th next. Many of the painters already receive more than 30 cents an hour.

Negotiations are still in progress between the Van Dyke Motor Car Company of Detroit and the Watson Carriage Company of this city, whereby the local firm will manufacture the commercial car here for the Canadian trade.

The Ottawa Vacuum Cleaning company has not yet secured suitable premises in which to locate its plant, but has several locations in view which would be satisfactory.

A representative of an iron and steel manufactory is in the city looking for a site on which to locate a factory to employ 200 or 300 men and use about 300 horse-power to operate.

Canadian Railroad Development

The Niagara Falls, Dunnville & Welland Electric Ry. Co. has applied to the Stamford Township Council for a right of way through that section. This company projects a line to run from Niagara Falls to Welland, and on to Dunnville. The road will extend from the Queen Victoria Park to Drummondville, out Lundy's Lane to a point near Allenburg, thence south to Port Robinson and on to Welland. From Welland it will run south to the Air Line Junction and then due west along the Forks Road to Dunnville. It is planned to extend the line to Port Dover at a later date. Between Welland and Dunnville the road will run over the highways for the most part, but between Welland and Niagara Falls it will have a private right of way the greater part of the distance. It will be for both passenger and freight and mail and express service. A local service will also be put on between Welland and Niagara Falls with an hour schedule. The road will bridge the Welland River and the Welland Canal at Port Robinson. The cost is estimated at about $1,000,000. F. R. Lawlor, Dunnville, Ont., is President and F. E. Misner, Welland, Ont., is Secretary.

Application is to be made at the present session of parliament for a charter for a railway, as follows: Main line—From Lloydminster, Sask., via St. Paul, de Metis and Lac la-Biche, to near Fort McMurray, near the junction of the Clearwater and Athbasca Rivers. Branches—(a) From a point on the main line south of the Saskatchewan River, westerly to near Bruderheim and onward to Edmonton; (b) from Lloydminster southerly via Medicine Hat to near the Milk River crossing of the international boundary; (c) from Lloydminster or a point on (b) southwesterly via Buffalo to near Black Falls and Red Deer, Alta.; (d) from Lloydminster or a point on (b) southwesterly near Manitou Lake near Scott to Saskatoon; (e) from Lloydminster or a point on the main line northerly via Cold Lake to Lac la-Loche and the headwaters of the Clearwater River; (f) from Lloydminster via Elbow, near Fort Pitt via Dore Lac and Lac-la-Rouge to Hudson Bay or a point on the Hudson Bay Ry. The name of the company which is to apply for the charter has not been given out. The solicitors for the applicants are H. R. Hall and H. C. Lisle, of Ottawa.

The Canadian Government now has already in hand or in view over $3,000,000, from western land sales to be devoted to the construction of the Hudson Bay Ry. Under the legislation of 1908 respecting the disposal of western lands for pre-empted homesteads, and the finding of purchase money for the defraying of the cost of the Hudson Bay Ry., 16,375,000 acres have already been sold, either as purchased homesteads or pre-emptions. The payments received on purchased homesteads now total $627,000, and payments received on pre-emptions total $667,000. The amount still to be paid on the purchased homesteads is $1,100,317, and on the preemptions, $21,678,717.

The new aqueduct at Ottawa, which is to cost $300,000, was inspected last week by members of the city council. About $135,000 has been spent to date.

Contractors and Builders Supplies

Crushed Stone

For Concrete Fireproof Construction, Roadwork and Sidewalks

Rubble, Portland Cement

CRUSHED GRANITE for Floors and Sidewalks
SEWER PIPE WEEPING TILE
FIRE BRICK FIRE CLAY

Crescent Fire Brick

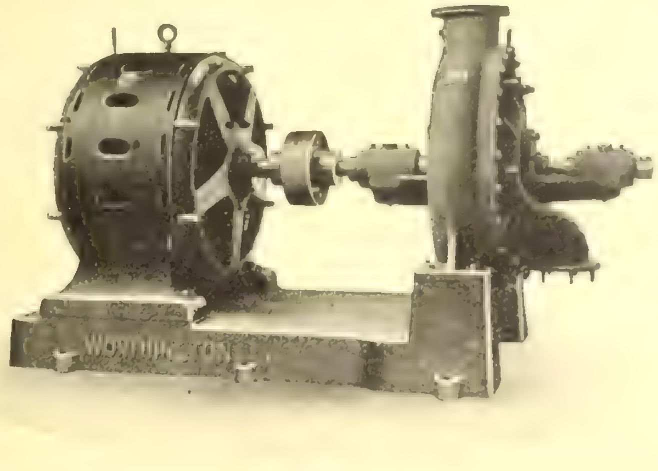
We are exclusive Distributing Agents for this high grade, hand-made fire brick. Large stock always on hand.

Don't forget our Prompt Delivery Service.

The Rogers Supply Co. - Toronto

Head Office: 28 King Street West Phone Main 4155

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

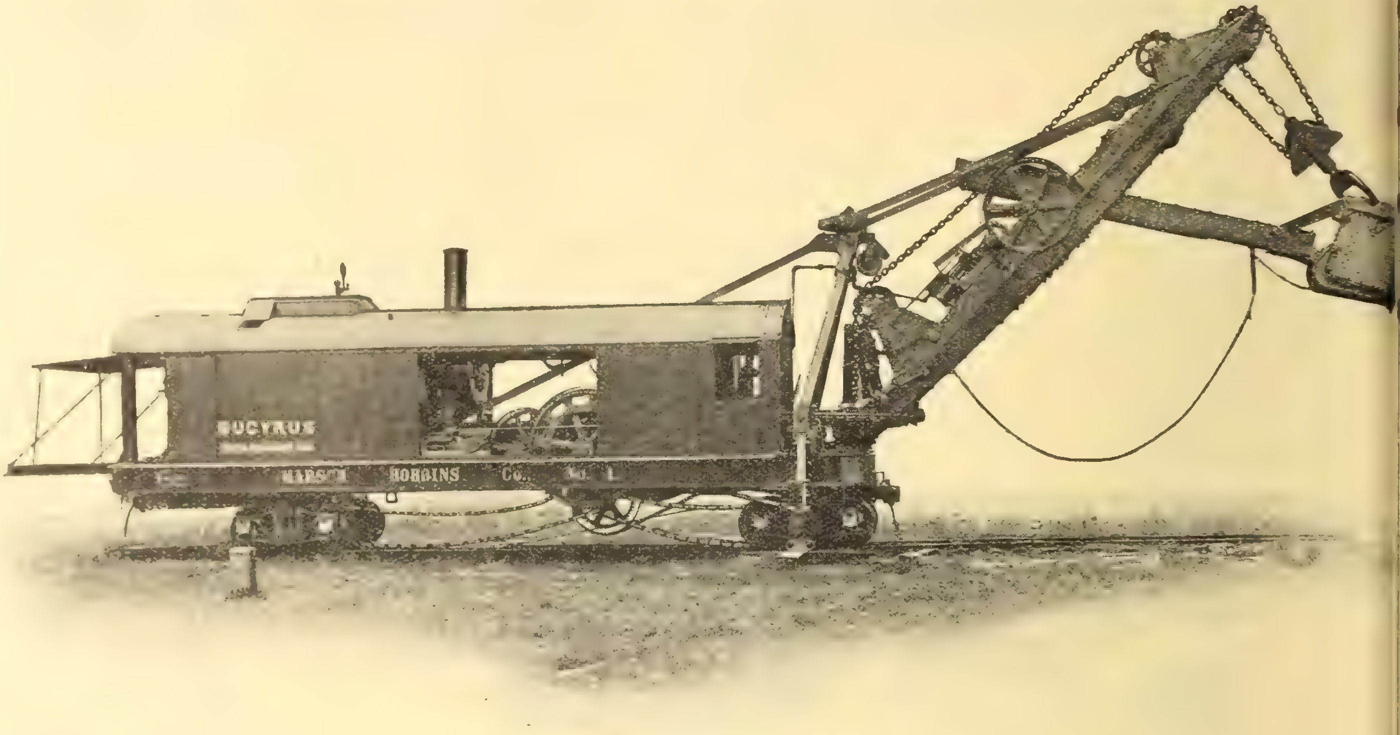
EFFICIENCY TELLS

WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

SEND FOR DESCRIPTIVE LITERATURE

WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
Limited



STEAM SHOVELS

all Capacities and Styles

Our Steam Shovels are known for rapid and efficient work combined with great durability

Let us Send You Catalogues

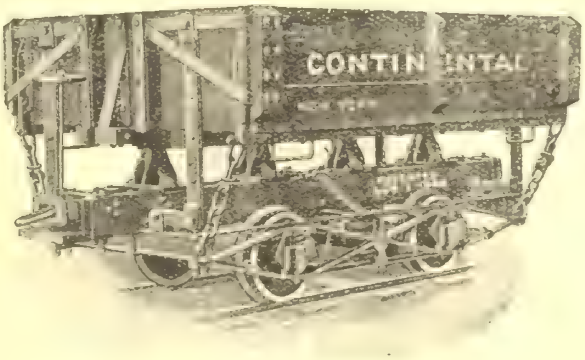
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine

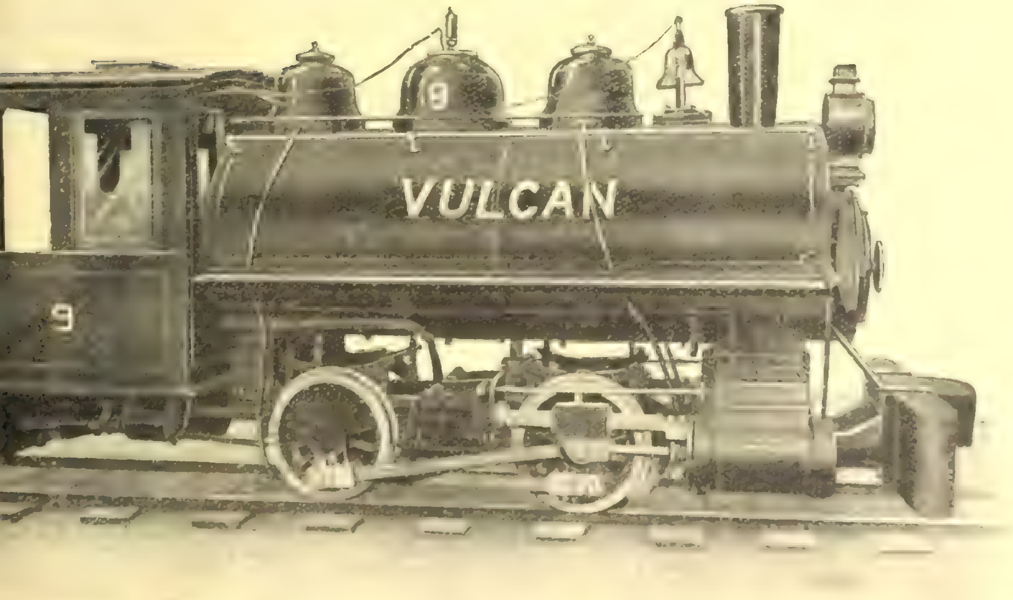
MUSSENS

LOCOMOTIVES
DUMP CARS

Also:

- Track Tools
- Hand Cars
- Motor Inspection Cars
- Velocipedes





LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Crown Block.
Vancouver, Mercantile Bldg.

Conduit and Sewer Pipe

Fire Brick

Glazed Tiles

Mouldings

Plain Enamels

Superintendent Wanted

The growth of our business has necessitated the formation of a department entirely devoted to BUILDING SUPPLIES.

We want a reliable, experienced, and competent superintendent to take charge of same.

The Ford Iron Co., 485 St. James St. Montreal

Fire Clay

Fireplace Tiles

Reinforcing Wire Mesh

Concrete Mixers

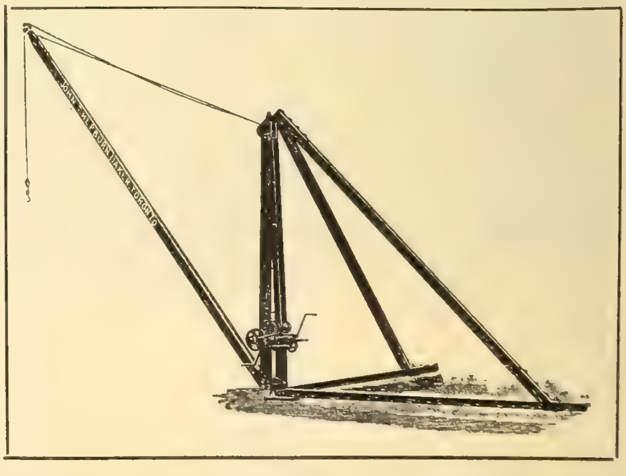
Wire Rope any size for all purposes

Every "Hepburn" Derrick, when it leaves our works, is equipped with an ample length of first quality wire rope.

But one Derrick will outlive many a rope. Our Wire Rope is

Strong, Flexible and Thoroughly Tested

When your old rope is worn, when you need wire rope of any size, in any quantity or for any purpose, you cannot do better than send direct to us for it.



Let us send you Quotations

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative
WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative
VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative
CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative
LONDON, ENG. - - - - - 3 Regent St., S.W
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 December 21, 1910 No. 51

"Cold Shoulder To Alien Labor"

Under the above caption, a Victoria, B.C., paper publishes an article which is doubtless intended to inspire the idea of "Canada for Canadians." There are subsidiary head lines: "Workmen Rush Here from Across the Line," and "City Engineer Determined to Protect Interests of Victoria Men." The information is given that a number of men from Seattle and points on the other side of the line, where conditions are in a very depressed state, have lately come to look for work at Victoria, attracted by the report that the city is prosperous and engaged in the prosecution of a large amount of work, which will continue throughout the winter.

The city engineer is stated to be adhering strictly to the policy of favoring all who make their homes permanently in Victoria. So far, so good. But the official is further credited with saying that there are too many strangers from American cities looking for work at Victoria, and that while the city is in need of a considerable amount of labor in connection with various work he would prefer to be inconvenienced for a few days, waiting for Canadian labor, to putting on the men who drift in from neighboring American cities.

The situation at Victoria is very different from what it is in eastern Canada. Quite recently City Engineer Rust of Toronto was advocating the abolition or suspension of the regulation whereby it is necessary for an immigrant, upon entering the country, to have twenty-five dollars in cash in his possession. We will not attempt to discuss this proposal, for there appear to be as many "cons" as "pros." Certain it is though, in our opinion, that it is unwise to offer direct discouragement to laborers seeking to improve themselves in the Canadian field. According to the Victoria paper the city engineer has issued instructions to all foremen to see that no outsiders are taken on until every available citizen has been put to work. From the viewpoint of local sentiment this is all very well, but if the question is considered in the more general aspect of the country's welfare, it must be conceded that Victoria has established rather a bad precedent. At this stage of her history Canada should give encouragement to labor. The country has to be developed and the work cannot be accomplished with the comparative handful of people now in the field. In a case like the one under discussion a certain amount of judicious discrimination is justifiable, perhaps, but we certainly think that it militates against the interests of the country to issue articles under such scare headings as the above. We want to bear in mind the interests of our own people, but in doing so we must guard against forming unfair prejudices. If we expect to get the other fellow later on we will have to give him a show now.

To The Reader

The publisher, after all, is only human. He is just as much susceptible to encouragement as the reader, and it is quite as much a stimulus in the one case as in the other. When the publisher is guilty of a mistake or an omission he invariably hears about it, but his scanty successes are not always impressed upon him so infallibly. We make no apology for reproducing the following extract from a letter dated Kingston, Ont., Dec. 13, 1910:

"I must compliment you on the excellent Special Number you have issued. It is a splendid compilation of useful information for brick men. I think your advertisements are a great piece of instruction and information in themselves. The illustrations used in the "Ads" are exceptionally good, and full of information to the trade. I am sure you will receive much praise for this excellent compilation."

The letter containing the above is not an isolated instance. An extract from a letter received from Ithaca, N.Y., last week reads as follows:

"I was much pleased with the special number of the "Contract Record." I must congratulate you upon the appearance of this number which I certainly think sets forth the clay industry of Canada in very attractive shape."

It is gratifying to know that one's efforts are appreciated. It acts as an incentive to greater things in the future. We want the reader to take a personal interest

> "My thoughts go out to you, my friend, this happy Christmas time, wishing you joy in all your deeds and days, wishing you time for the task, wisdom for the work, peace for the pathway, friends for the fireside, and love to the last."
>
> *The Editor*

in the "Contract Record" and to give us the benefit of his views occasionally. Criticism is always valuable—adverse and otherwise. The man who reads critically reads intelligently and encourages thought, endeavor, advancement.

Enlightening the Elector

John C. Macdonald is a candidate for aldermanic honors at Edmonton, Alta. According to the Edmonton Capital, Mr. Macdonald has several "new ideas" for the citizens. One of these he propounded at a recent meeting. It was that the city could save thousands of dollars a year by doing all civic work by day labor instead of by contract. That originality could be claimed for such a suggestion, even as far west as Edmonton, is almost incredible. Evidently Mr. John C. Macdonald is not a reader of the "Contract Record." If he were he would surely not be so bold in his assertions. As proof of his contention Mr. Macdonald pointed to the success with which the water department had carried out its construction programme. We would like a detailed statement of the work showing clearly all costs and disposition of material. Further, Mr. Macdonald stated that if the city of Edmonton adopted the method of day labor employment it would have great influence in settling strikes. We are writing to Mr. Macdonald and sending him one or two recent copies of the "Contract Record" in which the day labor system is discussed. Now that the elections are so near he will probably not care to change his tactics, but if he is unsuccessful this time he may like to espouse a better cause later on.

Unit Price Contracts

Unit price contracts should be for simple units of work, and not for several classes of work grouped under one head. In reading over a recent set of specifications for the construction of a small reservoir and appurtenances, we find that a great mistake has been made in this connection, says the Contractor.

For instance, under the head of excavation, there is included the clearing and grubbing of the site of the earthen dyke and the sheathing and shoring of the trenches for core wall and conduits. Under embankment prices, not only must all the work be done necessary to build the embankment, but also the turfing, sodding and planting of grass seed. Under the head of a concrete syphon, the excavation must be made, the concrete placed, and the embankment over it built in 6-inch layers. Let us consider some of the results of this grouping of such work.

First, as to its effect on bidding. Scan carefully the bids on work to be done under such specifications. There are generally one or two bids, that are from 15 to 25 per cent. lower than the other bids, caused by the contractors making low prices by overlooking or ignoring some of the various kinds of work to be done under the unit price. The contract being awarded on such prices means a financial loss to the contractor and frequently trouble and delay to the company letting the work.

Then, again, prices named on groups of work often mean trouble and disputes during the progress of the job. If a change must be made in the location of some structure, as a concrete conduit, the price bid may prove an unsatisfactory one to the contractor and he will object to the change. Yet it may be absolutely necessary to make the change, owing to soft ground or some other reason. By such a change, the amount of excavation may be increased fifty per cent.

If a separate price had been named for a cubic yard of excavation, a price per cubic yard of concrete, and an independent price named for the refilling and embankment, and if such a change were necessary, there could be no dispute, since the prices for each unit of work would be fixed, and the basis of payment would be plain to both parties of the contract. This is not possible when the excavation and embankment is included in the price named for the contract.

The greater the number of divisions of work, the easier it is for a contractor to name or fix prices for the job. Such prices will be reasonable, for he will know exactly what work is to be done, and thus will be able to estimate the cost and will only ask a fair profit. But should there he any doubt as to the amount of work to be done or as to its nature, as there frequently is when prices are asked on several classes of work under one unit, the responsible and far-seeing contractor must bid high in order to protect himself against possible loss.

It is very true that the grouping of work under one price means less work for the enginer, as in sewer construction, which is paid for by the lineal foot of completed sewer; yet the principle is wrong. The extra work thrown upon the engineer by unit bidding is more than compensated by the lower prices bid, and the fact that the contractor is more contented.

Much could be said on the subject to show the evils arising from the idea of saving work for the engineer. Within the past year a contract was let for some trench excavation, the price for the excavation including the sheathing and shoring. As the excavation was of considerable depth, it was contemplated that heavy timbers would have to be used to shore the banks, but the material proved to be such that little shoring was necessary and that with light timbers. The contractor's profits were enormous, much larger than they should have been for the amount of money involved in the job. In this case there should have been a separate price for shoring and for the excavation.

This example also calls attention to another practice which is wrong. In New York city shoring is often paid for by the square foot of area to be shored. Thus, on jobs stretching over a long section, where the depth of shoring would vary considerably, the city is compelled to pay an exorbitant price for such work. To protect himself against loss, the contractor must bid a price that will be suitable for great depths and unstable materials. Thus when depths are slight or when only light timbers are necessary he is overpaid. The best practice for both parties is to pay for timber shoring by the thousand feet board measure, and in some cases it is well to have separate prices for timber furnished and for placing.

All contracts should call for fixed units and great care should be exercised in the selection of these units.

The Vancouver Dry Dock & Shipbuilding Company, Vancouver, B.C., will next spring commence to build its dock and works at Roche Point on Burrard Inlet, about five miles from the city of Vancouver, where the company has some 7,000 ft. of deep water frontage and 600 acres of land. The financing of this proposition has just been completed in London and the work of clearing land at Roche Point is now under way. Other industries are also arranging to locate here. The company has obtained a subsidy from the Dominion Government for this work, of 3½ per cent. yearly for 25 years on $1,250,000, for the building of a steel pontoon dock of a lifting capacity of 15,000 tons. The company has now amalgamated with the Imperial Car, Shipbuilding & Dry Dock Corporation, Ltd.

Metal Wall Forms for Concrete Houses

The Design of a Washington Architect well known in Canadian Building Circles—Constructional Details and Cost of Equipment—Various Advantages

Last winter it was announced at the convention of the National Association of Cement Users that steel molds were to be used in the construction of all-concrete dwellings at Virginia Highlands, across the Potomac River from Washington. The work has been prosecuted during the past summer, according to the Engineering Record, and at present three houses are completed, and three more under construction.

The forms used are an outgrowth of studies made with a view of erecting economical sanitary houses. The forms consist of panels of No. 12 gauge sheet steel, 24 in. square, flanged on all four sides by a right-angled bend of the sheet. Each flange is punched at three points to receive wedge keys for locking the forms together. The panels are used in sets each two tiers high. In order to facilitate moving, the tiers are connected together by light rods attached to the panels at the mid-height of each joint, so that three or four of the panels of a tier are left rigidly fastened togeter in raising, the set being simply revolved by the aid of the rods to the new position for the next lift of concrete.

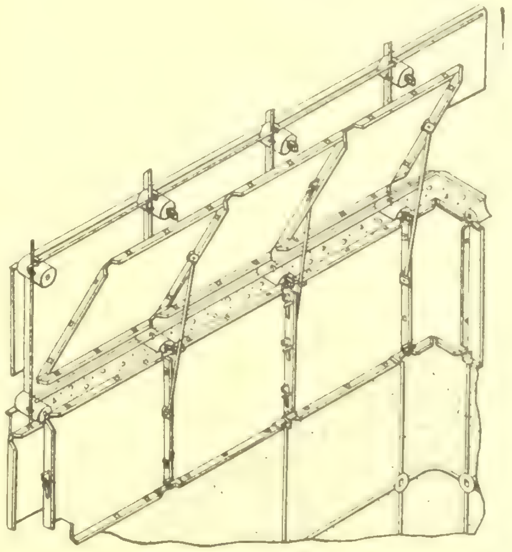
To obtain the required wall thickness a pipe or circular spacing block of the proper length is placed between the inside and outside forms at the meeting point of four panels. A thin metal strap passes through the spacing pipe or block. The strap projects beyond the ends of the pipe or block and is punched to receive a wedge placed outside the forms, thus locking the latter to the block. The entire equipment is held together by wedges so that any joint may be loosened by a stroke of the hammer. The entire form has ten different parts.

At building corners bent panels are used, and for filling out and piecing where full-size panels cannot be used wood and galvanized iron sheets are employed.

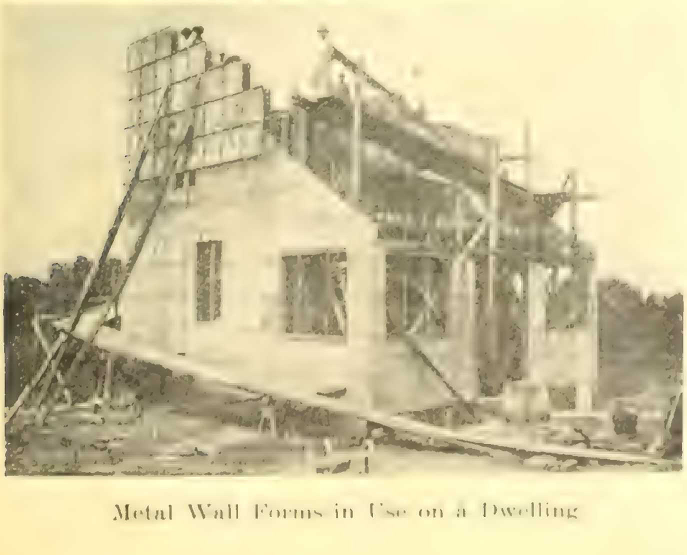
Experience has shown that the forms are quite rigid and do not, as a rule, need any outside bracing. Each time before using, the forms are cleaned and greased.

The same forms are also used for the floor construction. The reinforcement and spacing blocks are placed on the metal panels, the concrete poured and the upper form then slid into place, forcing out the surplus concrete. As a result very little finishing of the floor space is required. The spacing blocks for the floor are cast with projecting flanges, so that they give considerable support to the slab in that particular neighborhood and thus permit the lower plates to be removed after three days. A post is wedged under each spacer, giving up ports for the floor 24 in. apart. These are left in place until the concrete is able to carry the load.

It has been found that ridges are left in the surface by the joints and that the spacing blocks have a color different from the body concrete. These features have been used for ornamental effect, the lines and the spacing blocks, on which a rousette is cast, forming a pattern which is said to be quite pleasing. A sloppy concrete mix is used and stirred well in depositing. The concrete was mixed in proportions of 1:2:4, using gravel. A slight amount of clay was added to secure watertightness. Upon the removal of the forms the surface is given a thin brush coat in order to secure an even color.


Metal Wall Forms

The window and door frames are made of the same


Metal Wall Forms in Use on a Dwelling

Completed Residence Built with Metal Forms

thickness as the walls. A dove-tailed strip is nailed to them, they are then dropped into the molds and the walls poured around them.

It is stated that the entire equipment of forms for a dwelling measuring 28 x 28 ft. in plan cost about $600. Experience during the summer just passed indicates that the forms have a very long life, giving a low cost per house.

The forms were designed by Mr. Milton Dana Morrill, architect, Washington, who also designed the houses and superintended their erection and the use of the forms. He states that during the past summer 6-in. walls in these buildings have cost 11 cents per surface foot or about $6 per cubic yard, this figure including all material and labor required for setting the molds and also the cost of the concrete material. The cost of forms, however, is not included. The price of gravel was 60 cents per cubic yard; sand, $1.10 per cubic yard; cement, $1.04 per barrel. Mr. Morrill points out that the greatest saving in the work has been in the elimination of skilled labor, all the men, except the foreman, being common laborers receiving $1.50 per day.

Reinforcing Piers Which Have Failed

Straightening Bulged Walls without Demolishing and Rebuilding—An Inexpensive and Satisfactory Method—The Application of Channel Beams—Practical Directions

Very often the builder is called upon to straighten or reinforce the walls or piers of a building which have become bulged, twisted out of place or possibly fractured by reason of a variety of causes. Sometimes it is due to settlement through the presence of soft spots in the area of the site of the building, thus permitting the footings to become more or less displaced; sometimes the trouble is due to overloading of floors and then, again, it may be traceable to bad construction, says Building Age. Various, therefore, are the means required for overcoming the difficuty. A simple and inexpensive remedy calculated to render the building stable and safe without going to the trouble and expense of shoring, needling, demolishing and rebuilding, is illustrated in the sketches presented herewith.

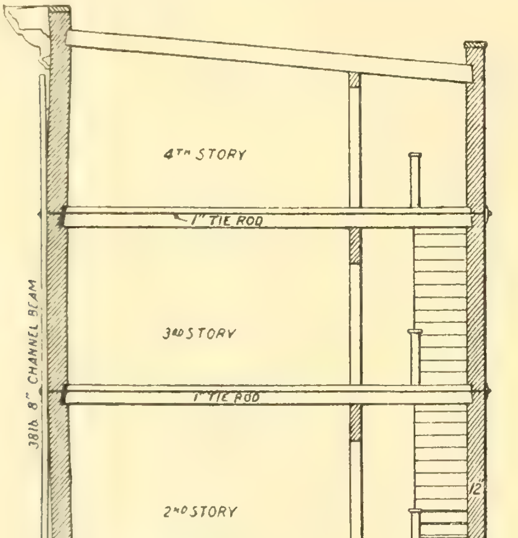


Fig. 1—Vertical Section Through Building showing method of Securing Channel Beams to the Bulging Front

Take, for example, the case illustrated in Fig. 1. Here we find the front 12-in. wall of an old store and loft building badly bulged at the second and third stories through over-weight of the floors. The difficulty was overcome by placing against each front pier and the wall between, as well as in the center of the piers, channel beams which were drilled for one one-inch tie rods and anchors. The tie rods were placed through the front wall between, or across and notched into, the floor beams, then through the rear wall, where similar anchors of larger area held them in place. A general idea of the arrangement may be gathered from an inspection of Fig. 1, while Fig. 2 is a horizontal section through the front

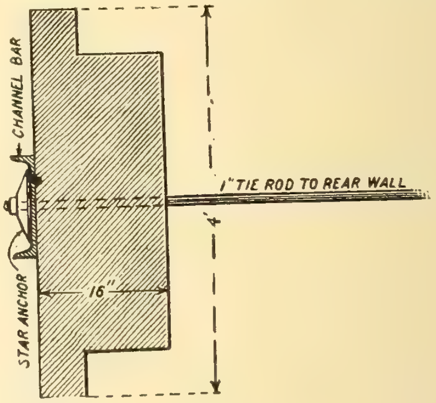


Fig. 2—Detail of Tie-Rod Connection

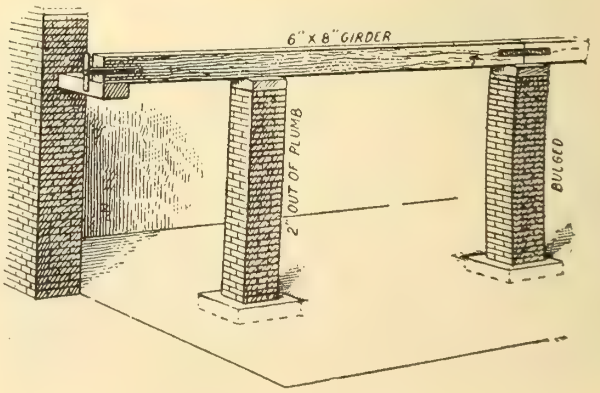


Fig. 3—A Row of Piers Out of Plumb

wall, showing more in detail just how the tie rods and anchors were used.

With a man stationed at the end of each rod and all acting in concert in carefully turning up the nuts tight against the anchors, the channel beams were made to exert a vertical pressure on the front wall of the building and to gradually draw it back into plumb without serious possibility of injury. When made safe and secure from a constructive standpoint, the channel beams were covered with sheet metal to form pilasters, after which they were painted to match the brick and stone details, thus producing a decorative effect.

In Fig. 3 of the sketches is represented a case where a line of brick piers in a flat-house or dwelling has settled so that they are out of plumb, thus rendering the construction unsafe. To shore up the girder and rebuild the piers was obviated by the simple expedient represented in Fig. 4 of the sketches, where a reinforcement of yellow pine timbers was introduced in the following manner:

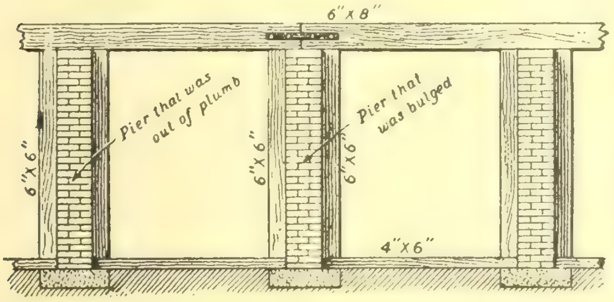


Fig. 4—Manner in which the Brick Piers were Reinforced

A line of "sleepers" or 4 x 6 in. floor timbers was cut in tight between the piers and resting on the concrete floor. Reaching from these to the bottom side of the fore and aft girder 6 x 6 uprights were driven into place with mauls, each upright being ¼ of an inch longer than the neat hight. Needless to say, the power exerted by these shores or uprights was so great that the girder was lifted clear of the cap stones of the piers and then wedged up tight from the cap stones.

Public Heating Plant

The heating mains of the Brandon system, as already installed, cover the principal business district of that city. The plant is said to have proved very successful and to have attracted considerable attention on account of its economy and convenience.

Besides the saving in fuel, the installation in individual blocks and houses is described as inexpensive, the ordinary steam pipes in a building being simply connected with the central plant. As an evidence of the satisfactory work of the Brandon plant, it is said that the largest building may be heated throughout in twenty minutes.

The Brandon Electric Light Company, which has installed the system, plans next season to extend it over the business portion of the city, as well as a large portion of the residential district. The company is sparing no pains to make the plant throughout adequate to the needs of the climate.

With this end in view the wrought-iron mains are carefully insulated against loss of heat. They are first carefully wrapped with asbestos paper held in place by spirally-bound copper wire. Between the iron pipe and the wooden insulating casing there is a 1-inch air space, the pipe being centered and supported by roller and ball bearing guides, which allow free expansion and contraction with change of temperature. The chief insulation s secured by the use of wood casing 4 inches in thickness. This casing is made up of kiln-dried, tongued and grooved white pine. The inside of the casing is lined with bright tin and the outside tightly wound with heavy galvanized wire. To prevent decay, the whole log is covered with a coating of asphaltum. A thorough system of under drainage is secured by placing porous drain tile along and below the entire system of mains, and piping same to sewers.

It is said that this construction results in an insulation against loss of heat so near perfection that condensation in the street mains is reduced to an average of not 5 per cent. of the season's output. Expansion devices are inclosed in brick boxes every 50 feet, and manholes give access to the valves at the street intersections. The heat is metered by a system of water condensation; the meter is a simple device which measures the water as it flows from the building.

An Emergency Hypochlorite Plant

In localities where the evidence points to a contaminated water supply as the cause of an epidemic, sterilization of the water is necessarily the best means of preventing further infection. Whenever it has been necessary to install an emergency hypochlorite plant in the small municipalities of Minnesota, the greater part of a week, and in some cases even longer, has been required for the work. This delay is usually caused by lack of material for the apparatus to administer the chemical. This gives an opportunity for futrher exposure to infection. After actual experience of such delays in installation the idea suggested itself that a small emergency plant could be constructed and kept in readiness by the State Board of Health. Such a plant could be transported by express to any municipality in the State within 24 hours and could in most instances be installed and in operation with 48 hours. This saving in time would undoubtedly prevent a number of infections. This plan of constructing and keeping constantly on hand a portable emergency hypochlorite plant was presented to the Minnesota State Board of Health at a recent meeting. The construction and maintenance of such a plant was authorized and designs are in course of preparation along the following lines, according to a paper presented at the Milwaukee convention of the American Public Health Association by Messrs. H. A. Whittaker and J. A. Childs:

Briefly, this plant will consist of a mixing tank, storage tanks and an administering device. The mixing tank will be about 30 inches in diameter and of equal depth. A cone is placed in it with the small end fixed about 1 inch from the bottom. A propeller is revolved within this cone, which causes the solution in the tank to circulate through the cone in either direction as desired, thus securing rapidly a thoroughly uniform solution. From the mixing tank the solution is drawn into the two storage barrels, which are used alternately. These hold about [illegible] gallons. From them the solution is fed into the administering box, in which a constant level is maintained and from which the solution is fed to the water supply at the desired rate. It is estimated that this plant will easily treat a water supply at the rate of 1,000,000 gallons per day, which is about the maximum consumption of most of the smaller municipalities of Minnesota.

Canadian Clay Workers' Annual Meeting

Enthusiastic Work at Toronto Convention—Helpful Addresses and Practical Discussions—Increasing Evidences of the Industry's Progress and Expansion—Technical Education

The eighth annual convention of the Canadian Clay Products Manufacturers' Association was held at the Prince George Hotel, Toronto, December 14-16. The meeting was a most successful one. The attendance was representative, and the various sessions were notable for the earnestness of the proceedings. "We are here for business," said President McCredie on the opening day, and the thought seemed to pervade the assembly throughout the whole convention. The oratory of the brickmaker is forceful and to the point. In the circle of the clay workers there are many men capable of eloquence, but the general feeling is in favor of short business-like discussions.

The proceedings opened on Wednesday afternoon, December 14th, after the registration of members. Those present included:

- W. McCredie, Lyons, Ont.
- O. Baird, Parkhill, Ont.
- J. W. Ball, Toronto, Ont.
- S. J. Fox, M.P., Lindsay, Ont.
- John Wardle, Blenheim, Ont.
- G. B. Mentz (G. B. Mentz & Co.), Walkill, N.Y.
- W. H. Wood, Brockville, Ont.
- Samuel Wright, Chesley, Ont.
- B. F. Davenport, Orwell, Ont.
- H. J. Norton, Alliston, Ont.
- Wm. Elliott, Glenannan, Ont.
- Jno. Watson, Bracebridge, Ont.
- D. A. Lochrie, Toronto, Ont.
- H. Brownscombe, Cargill, Ont.
- W. J. Packham, Brampton, Ont.
- B. E. Bechtel, Waterloo, Ont.
- Anton Berg, Toronto, Ont.
- Milton Smith, Cowal, Ont.
- W. J. Crowhurst, Port Hope, Ont.
- D. New, Hamilton, Ont.
- J. H. Warwood, Toronto, Ont.
- Wm. Pears, Toronto, Ont.
- A. Weller, Highgate, Ont.
- G. W. Moody, Ingersoll, Ont.
- W. E. Hales, Kingsville, Ont.
- F. Curtin, Lindsay, Ont.
- J. P. Martin (American Clay Machinery Co.) Bucyrus, O.
- J. F. Wilson, Parkhill, Ont.
- Geo. Whittington, Napanee, Ont.
- H. E. Hunt, Toronto, Ont.
- Geo. Crain, Beamsville, Ont.
- R. C. Brandon, Cannington, Ont.
- Henry Janes, Deleware, Ont.
- David Martin, Thamesville, Ont.
- J. Watson, Orillia, Ont.
- J. S. McCannell, Milton, Ont.
- S. J. Heafield (American Clay Mach. Co.), Columbus, O.
- Chas. A. Millar, Toronto, Ont.
- C. G. Frank & Sons, Strathroy.
- S. Furniss Co., Beaverton, Ont.
- W. H. Freeborn, Brantford.
- C. J. Lewis, Milton, Ont.
- W. J. Barchard, Toronto, Ont.
- C .A. Campbell, Hamilton, Ont.
- J. C. Wright, Proton, Ont.
- G. B. Drennan (J. D. Fate Co.), Plymouth, O.
- J. E. Frid (Geo. Frid Co.), Hamilton, Ont.

In the absence of Mayor Geary and Mr. Jos. Russell, M.P., addresses of welcome were made by Messrs. William Pears, of the Toronto Builders' Exchange, and C. A. Millar, of the Standard Brick Company. Replies were made by Mr. W. McCredie, Lyons, Ont., President of the Association, and Mr. B. E. Bechtel, of Waterloo.

In his annual address President McCredie dwelt briefly upon the advantages of Toronto as a convention city for the manufacturers of clay products. Toronto, he said, was the largest brick-making centre and he trusted that the convention would be permanently located there. "I need not tell you," he continued, "that we have had a very prosperous year. The outlook now is that manufacturers will be out of stock before the opening of next season; many have orders that will carry them far into 1911.

"During its eight years of existence our Association has accomplished a great deal. It has been of much benefit to its members in helping to solve difficult problems connected with their work, and it has also developed a spirit of co-operation, where acute competition and rivalry existed previously.

"I note with pleasure the attitude of our Association towards technical education. I have no doubt that we shall see in the near future a properly equipped school of ceramics established at Toronto or Ottawa.

"As clayworkers we have not done as much for the promotion of the industry as we might have done. We have been plodding along, trying to fill our orders and have not reached out into new fields. Some time ago a convention of a rival industry was held at London, Ont. From the pages of advertising given to that meeting and from the expenses incurred by the promoters in the way of exhibits and so on, one would think they were producing the only building material. We do not appreciate, as we ought, the importance of our products, for which in this land of great building development and greater possibilities, there is a vast field.

"We have not yet solved the problem of economical burning, nor, to my mind, shall we until we have a continuous kiln for the small brickmaker. Here is a field that might well engage our attention until we have learned the folly of wasting fuel. The thanks of the Association are due to the machinery men for their active interest in these conventions. We owe more to them than we are willing to admit."

The report of the secretary-treasurer, Mr. D. O. McKinnon, which was adopted, showed a balance of some $30 on the right side.

Technical Education

A number of the members of the special committee on technical education gave an account of what had been accomplished in this direction during the past season. This work was outlined briefly on page 87 of our issue of December 7th. Mr. J. S. McCannell, Milton, Ont., cited the success that had attended technical education in Germany. In that country every new industry started in at the bottom and studied every detail connected with the education of the workmen required. No subject was of greater importance to the clayworkers of Canada. They had all experienced the difficulty of obtaining good men. Mr. McCannell concluded by expressing confidence in the work of the Royal Commission on Technical Education.

Mr. S. J. Fox, M.P.P., who was a member of the special committee which visited the ceramic school at Columbus, established by the Ohio State University, gave the early experiences of that institution and urged the Association to send a resolution to the Dominion Government. Clayworkers had every claim to consideration, the combined value of their plants and deposits being one of the country's important assets.

The remainder of the session was devoted to general business and discussion. Amended articles forming the constitution of the Association were read by Mr. J. W. Ball, vice-president. There was some discussion over the proposal to make it compulsory for the president-elect to have had at least two years' experience. Mr.

William Pears was strongly opposed to such a provision. The opposition finally prevailed and the clause was reconstructed so as to confer absolute freedom of election upon members of the Association. A somewhat similar point arose in connection with the proposed appointment of the executive from past presidents. Messrs. Pears and Crain led the opposition against President McCredie, Mr. S. J. Fox and others. An amendment to the clause by Mr. Crain was finally carried.

On Thursday morning a committee, which had been specially appointed for the purpose on the previous day, brought in the following resolution, which was submitted to the members and carried unanimously:

"That this convention heartily approves of the Technical Commission appointed by the Dominion Government, and would urge upon the commission the necessity of considering the interests of the clay workers of the Dominion, and would suggest that they recommend the formation of a department for the study of ceramics, as it is one of Canada's largest and most important industries."

A committee was appointed to wait upon the commission's next sitting in Toronto, to urge the necessity for prompt action.

Tile Manufacture

An interesting address on the subject of Tile Manufacture was given by Mr. E. Biglow, of New London, O. Mr. Biglow is a recognized expert in this department of ceramics and attended the convention at the invitation of the Association. The speaker emphasized the necessity for care in the preparation of the clay in the manufacture of thin tile, describing the process in detail. The construction of the kiln also required much attention. It paid to use only the very best material. Mr. Biglow favors the use of long arched brick, 22 inches long, for tops of fire-boxes; also large blocks for the sides of fire-boxes. Kilns, he said, should be lined with nine inches of fire-brick laid mostly as headers, with through joints and with good fire clay. All the fire brick should be laid in the same manner. The process of water-smoking requires close attention. After the tile is dried the heat should be increased until it is all through the kiln. The kiln should not be allowed to settle until there is a white heat at the bottom. It will then settle safely and easily, with proper care in firing. There was some discussion on this subject at the afternoon meeting, and later, both Mr. Biglow and President McCredie gave their experiences in the manufacture of hollow clay blocks.

The paper on "Kiln Construction," read by Mr. J. H. Warwood, will be found in another column.

Mr. J. W. Ball, Toronto, vice-president of the Association, read an interesting and comprehensive paper entitled, "Defects in Manufacture Due to Kiln Troubles." Mr. Broadwell, Kingsville, Ont., gave an address on "Kiln Design," and distributed printed copies of the same.

Electricity in the Brick Plant

The feature of this session, perhaps, was an address by Mr. Chas A. Millar, of the Standard Brick Company, Toronto. Mr. Millar discussed the various advantages of electricity in the brick plant. It was not only economical and reliable, but it helped greatly in keeping the plant clean and presentable. In this respect, and in many others, it was greatly superior to steam equipment. Mr. Millar dealt at some length with the installation of electrical equipment, giving a number of practical and helpful pointers. Motors should be placed on a perfectly dry bed, preferably hollow. Induction motors with a voltage of 550 were the best, he considered, for the heavier classes of work. The motor was reliable, easy of operation and made the manufacturer independent. It dispensed with the engineer and the fireman. Another point in its favor was the evenness of the power. For safety, comfort and economy, he considered that there was nothing equal to electricity as a motive power. As to cost, a 50 h.p. motor could be purchased for from five to six hundred dollars. In the course of his remarks Mr. Millar admitted, humorously, that one occasionally received a shock of some 550 volts, but this was not very intense unless one happened to be standing on damp ground. An interesting discussion ensued, in which Messrs. J. W. Ball, William Pears and D. A. Lochrie were prominent. Mr. Ball said that if a comparison were to be made, only the most up-to-date steam equipment should be considered. He ventured to think that such a plant, furnished with all modern improvements, had many points in its favor. In both cases great precautions were necessary. Personally, he would prefer not to receive a shock of 550 volts. In his opinion, the element of danger in the use of electricity was not to be overlooked altogether. In the United States they killed men with it; it had superseded hanging (laughter).

Mr. D. A. Lochrie, Toronto, 1st Vice-President.

An address by Mr. A. M. Wickens, of the Canadian Casualty & Boiler Inspection Company, on "The Advantages of Steam Equipment," and a paper by Mr. H. E. Hunt, of Toronto, on "The Proper Care of Moulds," brought the meeting to a close.

In the evening an enjoyable banquet was held at McConkey's Restaurant, at which about fifty members were present. Mr. J. W. Ball, of Toronto, acted as toastmaster, and interesting addresses were given by Messrs. Wm. McCredie, Chas. A. Millar, B. E. Bechtel, J. S. McCannell, S J Fox, M.P.P., G. F. Hamilton, Henry Simpson, A. Berg, Geo. Crain, Alfred Wagstaffe, G. B. Merks and others.

At the Friday morning session considerable time was devoted to a discussion of the relative economy of piece work and day work. Messrs. J. S. McCannell, S. J. Fox and W. H. Freeborn gave the members the benefit of their experience. The addresses given by Messrs. McCannell and Fox will be found in another column.

At the election of officers held subsequently, Mr. Robert W. Davies, proprietor of the Don Valley Brick Works, Toronto, was unanimously chosen as president for the ensuing year. The remaining officers were elected as follows: 1st vice-president, D. A. Lochrie, Toronto; 2nd vice-president, W. H. Freeborn, Brantford; 3rd vice-president, David Martin, Thamesville, Ont.; secretary-treasurer, D. O. McKinnon; auditors, Messrs. Fox and McCannell. Executive: Joseph Russell, M.P., Toronto; W. McCredie, Lyons; J. S. McCannell, Milton; C. A. Millar, Toronto; S. J. Fox, Lindsay. It was decided to hold the next convention in Toronto. There was a pretty general consensus of opinion that Toronto would be the best meeting place for the next two or three years.

Piece Work and Day Work

Discussion by Two Prominent Brick Manufacturers—Why the Former System is the More Advantageous

J. S. McCannell, Milton, Ont.

Which i sthe better system on a brick plant, day work or piece work? Someone might answer, neither, and say that the bonus system is the best of all. It is impossible perhaps to apply any one of the above systems and say that it is the best. What might be best on one plant might not work out at all on another. If a plant is not kept in first-class running shape one cannot expect employees to make a success of either piece work or day work, from the employer's standpoint.

With day work a workman is sure of his day's pay, but no matter how much harder he works than the other fellow he does not make any more money in a day. He has no incentive to spur him on to his best efforts. It is generally admitted that where it is possible there is an advantage both to the employer and the employee when some system can be worked out that will be agreeable to both parties.

On piece work an employee feels that he has something to work for; he is working more for himself. The harder he works, the more he makes. If he can get more work out of the machine he is reducing the cost of the goods, and his employer shares in his gain also. On piece work one should have an idea what the work is worth, and both parties should have confidence in one another that if a good day's pay is made the work shall not be cut down. If there is a lazy man in the gang, success will raise the standard of the men. The better workman will go where he can make the most money.

Will a piece worker take greater care of his machinery than the day worker? I believe that the inducements are greater. A gang of men will sometimes overlook a defect in the working of a machine that they would not overlook if they were on piece work. A system that will keep machinery to its maximum output is a saving in more ways than one. Less capital will be required as less machinery will do the work.

In one case a factory reported that they turned out more work in a week, working nine hours a day, with the Saturday half holiday, than they did formerly in a ten-hour day, six days per week. The employees did not suffer from the reduction of hours, but on the contrary, made more wages. It is admitted that in times of keen competition the firm that can produce goods at the minimum cost are serving their own interests as well as those of their employees.

When a man is working on the day work system, he knows what he is going to have for his day's work, and in some cases may not be willing to risk a certainty for what he thinks is an uncertainty. In cases like this the firm should explain fully any system of piece work and show that the object is more money, and not less. In one case, a company that worked all piece work installed a new machine the working of which was new to the employees. To overcome the difficulty this machine was worked two months on day work until the hands understood the working and saw that they could make more money by the piece work system. In another case, a gang of Italians were loading shale by day work. The boss wanted them to try the work by the ton. He tried several times, but the men seemed afraid of it. But one day when he said ''Ten men load one hundred cars, get ten hours pay, take pail and go home,'' they were willing to try it, and the bargain proved satisfactory to both sides. The one thing that they wanted to be assured of was that they were going to get the full day's pay. Once the element of uncertainty as to the amount of pay was eliminated they worked more cheerfully and did more work in shorter time than they had done before.

In some cases the premium or bonus system is employed successfully in place of piece work or day work. In this way the employee is sure of a certain amount each week, while if he works harder the amount is increased according to the work done over the amount agreed as a day's minimum. In other words, he makes his day's wages plus the bonus earned. This inspires a man to do the best he can, and in many cases he will devise ways to do the work better and more quickly than by day work, thus benefiting both himself and his employer.

In conclusion, any plan or system that will promote good feeling between employer and employee, and make an employee feel that his work is worth while and that he has a chance to make all there is in the work, is the proper system to have. No hard and fast rule can be laid down. What will work in one place may not work in another. The thing must be worked out, having in view the best interest, not merely of the employer, but of the employee as well.

S. J. Fox, M.P.P., Lindsay, Ont.

Personally, I am in favor of piece work where it can be done in that way, but there is a good deal of work that can not be carried out except by the day.

Let us first consider the kind of workman we have to deal with. For convenience we will make three classes:

1st. The careless, lazy and shiftless, who only works because he has to, who will stay with you just as long as you will put up with him and whose only interest in his work is quitting time and pay day.

2nd. The steady and honest laborer, who is contented in any place, who is satisfied with 10 hours' pay for 10 hours' work, who is always on hand for any work and at all times.

3rd. The man who is full of energy, quick and active, taking more interest in his work than quitting time and pay day.

With these three classes all working by the day, at the same work, it is very hard to pay each a different rate of wage per day. If they are at different jobs you can grade the men, so that the best gets the best place with the higher pay.

The steady and honest man is not to be despised, he is like oil to the plant, making the working smooth.

Now taking the above three classes working by the day, it appears as follows:

1st. The shiftless and lazy. The employer suffers.

2nd. The steady and regular. No one suffers.

3rd. The active and quick workman. It is he who suffers, because the employer dare not give him more pay.

Now the advantage of piece work is that it acts as a stimulus to the men. They know if they do not the work they will get less pay. Each is placed on his metal and has a chance to earn more money, which means a larger output of the plant.

In piece work the shiftless man must be looked after or he will do poor and rough work. The only thing to do with him is to put him at work that he cannot spoil, and not in a gang of good men.

The steady fellow is stimulated knowing that he can make a little more pay.

The smart active workman, whose pride is quality and quantity, gets the most responsible and best paying job in the plant.

A great deal depends on the grading of the men, the division of the work and having no drones in the gangs.

Up-to-Date Kiln Construction

Practical Brick Man on Relative Merits of Various Types—General Principles of Construction Outlined

By J. H. Warwood, Toronto

There are many different types of kilns to-day. In most cases each style is adapted to some particular kind of clay or line of manufacture. In this article it is my intention to discuss three types of kilns that are most generally in use: the round down-draft, kiln, the rectangular or square down-draft kiln, and the continuous kiln. If we are to judge the above types of kilns by the number in use and the amount of ware burned in them, we must give precedence to the round down-draft kiln I believe there are more of them in use to-day on the North American continent than all other types combined. The size and construction of round kilns vary to meet the requirements of the ware to be burned, but the size most generally in use and which gives the best all-round satisfaction, is the 30-foot inside diameter kiln, 8 feet to the spring of crown, and 7 foot spring in the crown. The kiln should be built of good material, and lined in the parts exposed to fire with a good grade of fire brick. It should be properly banded with at least six bands, three of one-quarter inch by six inch, and three of one-quarter inch by four inch iron.

In the matter of furnaces, there are several types, all of which are good for their respective purposes. Their selection is often best decided by the fuel used and the material to be burned.

The next question is that of kiln bottoms. Here we reach a point in kiln construction upon which I believe more thought and endeavor has been spent than on any other part of the manufacture of clay products. It has been my experience that the open or riddle bottom kiln with an individual stack is invariably the most successful, notwithstanding the fact that solid bottom kilns, and also another type, multiple chimney kilns, are successfully used in many places at the present time.

The points of superiority claimed by those who are using the round kiln are that, considering capacity, they are from twenty to thirty per cent. cheaper to build than the square kiln. The product is more exposed to the heat in the round kiln and therefore it becomes possible to burn the same clay more quickly than in a square kiln, and your brick will stand up better if you are making a vitrified article. Also, the more exposed condition of the brick when set facilitates the production of a better grade flashed brick. The importance of this may not be appreciated by many Canadian brick makers. It is a fact, however, that flashed brick is a very popular article in the United States at present, and the leading Canadian manufacturers are now making this brick. The upkeep for repairs is much less in the round than in the square kiln. In the matter of fuel consumption, it is impossible to set any fixed amount as the maximum or minimum to be used. I have burned at times one-half ton of coal per thousand to make all-hard brick, and again, with kilns which were connected, or continuous, I have accomplished the same with less than 400 pounds of coal per thousand, in which case it compared favorably with the best regularly constructed continuous kilns. With this advantage in firing kilns that are so connected, you have the opportunity to hold and handle the product until satisfactorily burned. In smaller-chambered or regular continuous kilns this is not so.

The square down-draft kiln is an excellent and popular kiln, and in many cases it is the most adaptable for the needs of the manufacturer. The general principles of construction are the same as in the case of round kilns. If you desire a satisfactory and lasting kiln, good material and good workmanship are essential. The usual size, as best adapted, is 18 feet wide by 7 feet 6 inches to spring of crown and 7 feet 6 inches spring of crown. If handled by a single stack about 54 feet is the desirable length, but if multiple chimneys are used they can be built much longer.

A very essential thing in square kiln construction is to have the kiln strongly and properly ironed. There is no part of a plant that, if not constructed satisfactorily, will cost so much for repairs and cause the owner so many uneasy moments as a bad burn, which is usually the result of a poor kiln.

The points in which a square down-draft kiln is superior to the round one are that it is more accessible to set and draw, and that the door can be made large enough to accommodate a wagon; also, that on account of the less exposed surfaces to the fire, where a solid colored face brick is desired, a better colored brick is obtained.

We have now reached a point where we can take up the question of continuous kilns. The principal need to-day with the brick maker is that of economy of manufacture and at no point in the process of making is there so much variance in cost as in the burning.

Individual down-draft kilns consume from eight to twelve hundred pounds of coal a thousand. The continuous system, using from three to four hundred pounds a thousand, more than halves the cost of burning in individual kilns.

The types of continuous kilns in use are many. The top firing and open top kiln has many supporters in the common brick trade. Its comparatively low cost of construction and its economic burning of ware make it in many cases a favorite with the manufacturer. But on account of the earth dressing, which is necessary on top of the kiln, the clinkers, dust and ashes caused by burning the fuel in the ware, makes a kiln of a type undesirable for anything but a common product.

The next type I will mention has a close relation to the last type of kiln described, with the addition of a crown or arch which does away with the top dirt. But on account of its being fired from the top we still have the undesirable clinkers and ashes to contend with. Then we have the continuous form of kilns with the side furnace, the same as an ordinary down-draft. The most modern construction of continuous kilns to-day is a series of compartments equal in size to many individual down-draft kilns. So it is seen that while continuous kilns are becoming more closely related to individual down-draft kilns, and while they retain their fuel-saving qualities, they are reaching for the individual control that the down-draft kiln possesses. While the continuous kilns have been becoming more like the individual kiln in their system of handling, the individual down-draft kilns have been leaning towards the continuous system. I have seen old down-draft kilns connected up by flues so as to work continuously and burn all hard brick with three to four hundred pounds of coal to the thousand.

The last and perhaps the most essential feature of all burning is attention and horse sense on the part of the man behind the shovel.

County Engineer Farley of Carleton has issued his report on the work of the past season. During the summer 10½ miles of road were graded; 10½ miles were graded and gravelled; 3½ miles graded and macadamized. One reinforced concrete bridge and a large number of culverts were constructed. The expenditures up to date by the different municipalities are: Gloucester, $3,975.08; Nepean, $1,099.27; Torbolton, $1,147.17; Fitzroy, $2,271.74; Osgoode, $1,001.75; North Gower, $431.10; Huntley, $1,733.08; [illegible]; March, $872.74; Marlborough, $1,054.88; Goulbourne, $3,014.10.

According to a recent despatch from Edmonton, Alta., construction will be commenced on the Southern Central Pacific Railway as soon as certain privileges have been granted by the Government. Roughly, this road will run in an almost direct line from Vancouver, B.C., to a port on Hudson's Bay, some hundred and fifty miles to the north of Fort Churchill. The company proposes to build several feeders across the international boundary as well as through the Peace River country, which the line will cross.

The Brick Resources of Western Canada

Medicine Hat and its Connection with the Industry—Alberta Clay Products Company's Great Plant — Progress at Prince Albert and Strathcona

Western cities are nothing if not progressive, and Medicine Hat, Alberta, is no exception. It would be strange, indeed, if there were nothing of interest to record as to this city's connection with the clay industry. It is situated in the centre of a clay belt, and is bountifully supplied with natural gas. Wells which have been in service for five years or more, show no diminution in pressure or loss in volume.

Two years ago this city started an advertising campaign for industries, the result of which was the location of the Alberta Clay Products Company, who, during the present season, started the construction of a three hundred thousand dollar plant. This company is constructing ten 30-foot and four 40-foot down-draft kilns; a dry room of four storeys, 100 feet by 300 feet in area; a brick press building, 50 feet by 70 feet, on the first floor of which are at present two dry-press machines, which are turning out thirty thousand brick per day each. Eventually this floor will have five presses. The upper storeys are devoted to elevators and storage bins for the ground clay, and the basement to the grinding pans. Adjoining this building is the terra cotta pipe and tile press, located in a building of the same size and capable of turning out pipe from four to twenty-four inches in diameter. Larger machines will be installed during the winter so that by the spring the plant will have pipe from four to forty inches in diameter. Adjoining the press room in a separate building is the power house, consisting of one unit heavy duty rolling mill type engine, of 450 h.p., and a battery of three Leonard boilers of 150 h.p. each. The company have also erected a machine shop to facilitate repairs in and about the plant. When the plant is in full operation its output will be twenty cars per day.

The manager, Mr. Overpack, intends, upon the completion of this work, to install plant and kilns for the manufacture of paving brick and light pottery. In the clay bed, which this company own, are found all the qualities of clay required for these various clay products. The company have already made some very fine fire brick, which tests have shown to have very high fire resisting properties. This bed is found at Coleridge, five miles from Medicine Hat, and the material is brought to the factory on cars, passing into the clay shed on an elevated track. All the materials are burnt by natural gas. At present the company have in operation four temporary kilns for the manufacture of brick. These have a capacity of three hundred and fifty thousand brick each.

The city, alive to the importance of the industry and to the advantages accruing from the possession of an up-to-date plant within easy access of its operations, made generous terms with the company. The inducements offered were a free site of about ten acres, a gas well with a daily discharge of about three million cubic feet, exemption from municipal taxes for ten years, and water supplied at the rate of ten cents a thousand gallons.

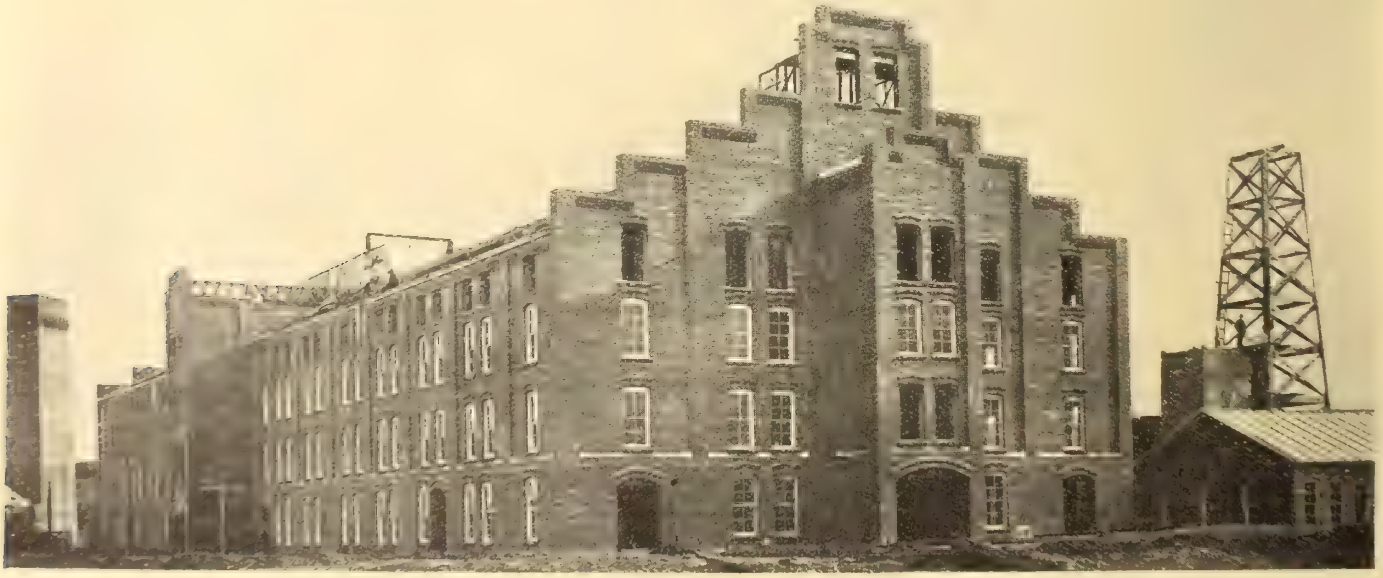
At the present time the company are manufacturing all the brick required for the construction of their plant, and last month shipped two million brick, in addition to their own requirements. It is their intention to manufacture a heavy line of 4, 6, 8, 10 and 12-inch terra cotta pipe, so that they may be in a position to make prompt delivery in the early spring.

The officers of the company are: James Campbell, Lehigh, Iowa, president; A. R. Daughenbaugh, Gowrie, Iowa, vice-president; and Warren Overpack, Medicine Hat, Alta, treasurer and manager.

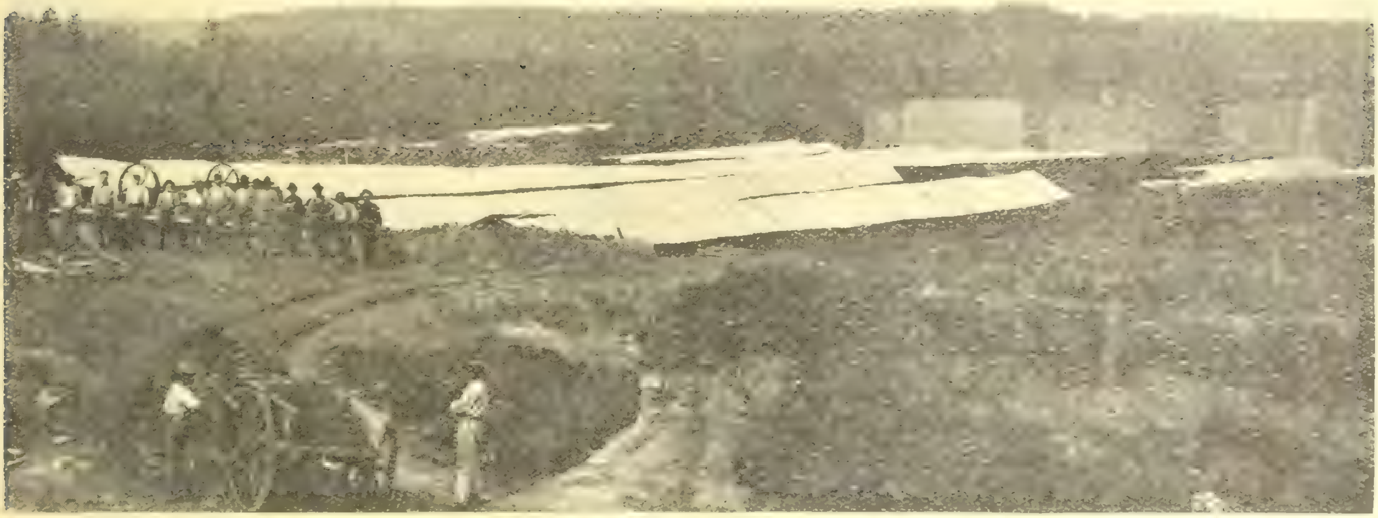
During this season the city of Medicine Hat has used 400,000 brick—250,000 for the construction of sewer manholes, and 100,000 for electric light and power plant, the balance being used for miscellaneous city work.

Opening of Alberta Clay Products' Plant

The half million dollar plant of the Alberta Clay Products Company was formally-opened for the inspection of the public. Over 2,000 visited the works, including several hundred guests from points ranging from Brandon on the east,



Sewer Pipe Department and Dry House, Alberta Clay Products Company, Medicine Hat, Alta.



Prince Albert Brick Company's Plant at Prince Albert, Sask.

to Okotoks on the west, Lethbridge on the south and Edmonton on the north.

A banquet was held on the fourth floor of the building. The chair was occupied by William Cousins, of Medicine Hat. Among those present were: John Dixon, of Maple Creek, director of the company, Hon. C. R. Mitchell, Attorney-General of Alberta, Mayor Jamieson, of Calgary, Mayor Bowman, of Lethbridge, Supt. Coleman of the C. P. R., Mr. Hotchkiss chief of the provincial publicity staff, John T. Hall, publicity commissioner of Brandon, and Commissioner McMullen of the C. P. R.

There are now 325 men employed at the works. The plant is claimed to be the second largest on the continent. The main building has a floor space of 200,000 square feet and is six storeys in height. It is heated by over nine miles of steam piping and lighted by 535 thirty-two candle power electric lights. The electricity, heating system and fires for the kilns are all supplied by natural gas from a well on the company's property.

Prince Albert the Substantial

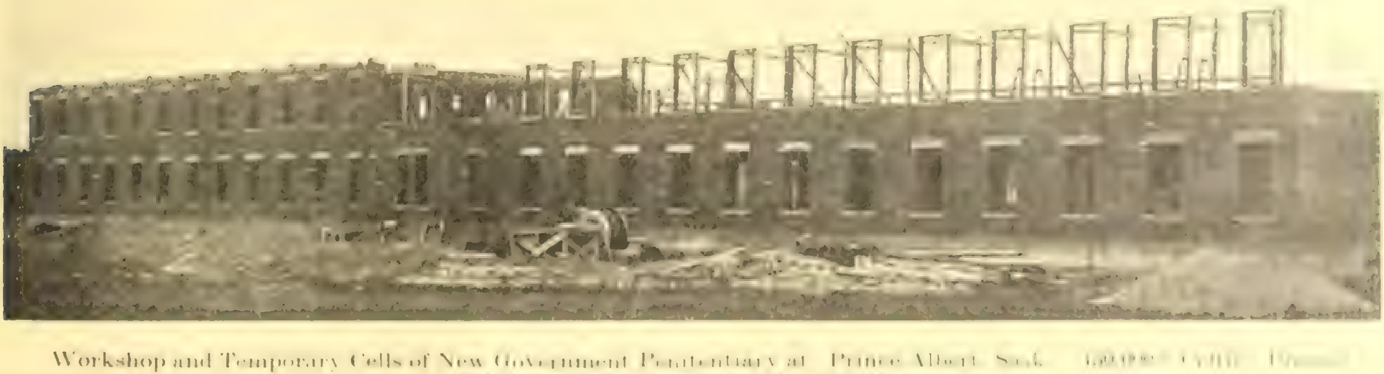
There are not very many towns or cities in the West able to boast of being located at the base of supply of two of the principal commodities used in building construction—brick and lumber, yet that is the fortunate position of the city of Prince Albert, the most northerly of the four cities of the growing province of Saskatchewan. Prince Albert lumber is shipped to all points in the prairie where there is an ever insistent demand. One hundred million feet will be cut in the district this winter, which will give some idea of the value of the industry to the city.

Prince Albert brick is not shipped out at present to any very great extent—there is too much local demand. There are in the city, or within a mile or two, four brick yards. Of these, perhaps the most modern is the plant of the Celtic Brick Company who are engaged at present almost exclusively in making pressed brick. The others, namely, the Red Rock Brick Company, the Prince Albert Brick Company, and H. H. Ittner, all make good common brick of a fine red color. The Celtic yard will probably turn out common brick also next year.

Between them, these four yards have turned out this year approximately four million and a half bricks. Of this amount practically all has been sold in the city and gone into building here.

The total value of permits issued to date amounts this year to nearly half a million dollars, nearly all of which is for buildings of brick construction. Prominent among these structures are a new theatre which will measure up 700,000 brick, the structure costing about $30,000, and the Masonic Temple, which cost about $60,000, and measured up about 600,000 brick. Other structures such as the wholesale warehouse for Messrs. Cameron & Heap, and the new Pollock block took about two hundred thousand apiece.

The building which has gone on this year has been confined mainly to business blocks and large residences. It is expected that next spring will see a good deal of small



Workshop and Temporary Cells of New Government Penitentiary at Prince Albert, Sask. [illegible] Celtic Pressed Brick are being used in this Building residence building, and for this there is a great opening as numbers of families have had to leave owing to there being no adequate place to live. In this connection, too, it might be added that it is probable that a sand-lime brick plant will be put in here by local capital.

There is hardly a building of any importance in the city which is not almost wholly brick. One or two are faced with stone and cement, but solid brick predominates, the larger ones being strengthened with structural steel and iron. It is no particular wonder with a good supply handy and the price running pretty low. Common brick this year has been worth about $10.50 per thousand, while pressed brick for facing has been bought for about $20. Immediately outside the city limits there is being erected the big penitentiary for the Province of Saskatchewan. As a start, a contract was let for the construction of temporary cells, which will afterwards be used as a workshop. Four hundred and fifty thousand Celtic pressed brick are going into this building, which is shown in the illustration. The actual main building will be built by the inmates from brick made on the spot, a fine clay bed being on the grounds of the institution.

Celtic Brick Company's Prince Albert, Sask.

The municipality has not consumed a great deal of brick this year. Such as has been used has gone mainly into manholes and so forth. Considerable extensions have been carried out to the sewer and water systems of the city, but this has not involved the use of much brick.

High School, Prince Albert, Sask.

The effect of the brick construction at Prince Albert is to give the city a singularly substantial appearance. It is safe to say that no city of its size in the West, (Prince Albert's population to-day is about 8,000) has so permanent an appearance. Tenth street and Central avenue, which promise to be the two principal business streets, will shortly present a solid brick front, while First avenue west and River street are changing from frame to brick steadily, if somewhat slowly.

After all, Prince Albert can lay claim to respectable antiquity, as antiquity goes in the West, it being some forty years old. It would therefore be unreasonable to expect the newness of the frame towns of the prairie. But the rapidity with which the district around is opening up and building of brick, the increasing railroad construction nearby, and the development of the city's natural resources go to make Prince Albert one of the soundest and most solid cities of the Canadian West.

Prince Albert Brick Yards

Of the four brick plants located at Prince Albert the most important is undoubtedly that of the Celtic Brick Company. This concern owns about 40 acres of fine clay situated about two miles from the city. The illustration gives a fair impression of some of the buildings. The company has a Chisholm, Boyd & White plant, with a daily capacity of 20,000, the clay being gathered by two Quincy clay gatherers. The plant has been working at full capacity this year, with about twenty men employed. A considerable quantity of Celtic brick has been shipped to different parts of the province—possibly as much as half of the output. This amounted in 1910 to a million and a half. The Company intend making a good common brick next year and Manager Ross says he is already receiving many enquiries. The Canadian Northern Railway have a spur line into the Celtic plant, and every facility for loading and shipping is to be found.

The next largest yard, so far as the output is concerned, is that of H. H. Ittner. Mr. Ittner has turned out about one and a quarter million brick this year. Almost all of it has been used in the city. The present bed is just about exhausted, and he has acquired, recently, 40 acres of new clay bed, which he proposes to open up next summer. The entire new plant will be bought by Mr. Ittner in the east this winter. He intends making a tour of the largest plants on both sides of the line, inspecting the machinery. His new yard will have track facilities, and with the building anticipated here next spring he will no doubt find a good demand.

The yard of the Red Rock Brick Company is situated two or three miles beyond the city on the north side of the river. The output of this yard this year has been a little over half a million, of which about half has been sold in the city and half outside. The Red Rock Company own 120 acres of splendid clay. This clay is covered largely with jack pine and poplar. As the land is cleared the clay is uncovered. This makes the fuel problem very simple. The output of this yard is towed up the river in barges by a tug and landed in the centre of the city.

The Prince Albert Brick Company, of which Mr. Wm. Knox is manager, made about three quarters of a million this season, most of which was used in the city. Both this plant and the Red Rock plant make a fine grade of common brick.

It will seem that with these four plants in operation Prince Albert is well situated in regard to her brick supply.

J. E. Woodward.

Cleaning Brick Fronts

An expert in the sand-blasting trade who has operated on many buildings, on being asked as to the efficiency of the sand-blast upon soiled brickwork, said that he could not advise it except when the brick were extremely hard. When used against stone the blast does not remove the original face, he said, "only the grime." But in the case of brick, not extremely hard, the result might be different.

The force with which sharp sand can be driven through a fine nozzle is very great. If permitted it would quickly cut a stone in two. In the case of granite, marble and cut stone the skilful operator preserves the original face of the block, but he cannot guarantee to do so with respect to all sorts of front brick. He advises cleaning front brick with acid instead of sand-blasting. The same opinion seems to be held abroad. The cleaning of brick fronts was the interesting subject of a paper recently read before the German Association of Brick and Terra Cotta Manufacturers. The author protested against the use of sand-blast or other method by which the original face of the brick would be taken away, saying:

"When the blast is used, and the face of the brick taken off, the cleaned front will show a good appearance only for a short time, as the brick with the original face removed will be very much more porous than before, and absorb dirt more readily. The use of steel brushes is also very bad, and will not give a first-class job. The best method is cleaning the brick fronts with a solution of muriatic acid. The strength of the solution can be made to 1 in 12. When this solution is too strong for the brick, acetic acid should be used. A good soap solution will, as a rule, take off all thick dirt, and the cleaning with acid solution can then be done easily."

Collegiate Institute, Strathcona, an example of the Modern Educational Building now being erected in progressive Western Canada.

Brick Making At Strathcona, Alta.

Brick of good quality is manufactured in the city of Strathcona, the brick clay being found from 15 inches to 2 feet below the surface. The depth of the brick clay is from 12 to 25 feet. At the present time there are three brick yards in operation with an output of 10,000,000; but so great is the demand that all the manufacturers are increasing their capacity so as to cope with the increased demand from the cities of Strathcona and Edmonton. Beside the manufacture of the ordinary wire cut brick, pressed brick and drain tile are manufactured extensively, and a company has just been formed and has the machinery installed for the manufacture of sewer pipe. The amount of brick used in the city of Strathcona can be arrived at from the fact that the building permits up to November 1st, 1910, totalled $970,000, 80 per cent. of which are brick buildings.

Brick Paving At Berlin, Ont.

The town of Berlin laid its first permanent pavements this year. The contract was given to the Warren Bituminous Paving Company to lay a pavement on King Street from Scott Street to Water Street. It consists of a Bithulithic pavement laid upon a 5-inch concrete foundation with Metropolitan block vitrified brick in the street car track allowance. It is 2,572 feet long with an average width of 42½ feet. The ties for the double car tracks were laid upon a six-inch concrete foundation, and bedded in concrete. The bricks were placed upon a 2-inch sand cushion, upon this foundation, and the joints filled with a cement grout. Three rows of brick are laid along the outer rail of each track, making a total width of seventeen feet of brick pavement.

When this contract was completed, another was awarded to the same company to extend the pavement on the same street with a single car track, from Water street to Wellington street, a distance of 2,470 feet. It was also extended from Scott street to Alberta street, a distance of 1,252 feet. This has a double car track. The construction of these last two pavements is the same as the first one. The price for the brick pavement was $1.83 per sq. yard, and $4.50 per cubic yard for the concrete foundation.

Brick makes a very suitable paving material for the car track allowance. It wears well, and can be removed to make necessary repairs to the tracks.—Contributed by W. M Davis, Town Engineer, Berlin.

The California State Legislature has voted bonds to the value of $18,000,000 for good roads construction throughout the State.

A Leading Canadian Brick Plant

Situated at Laprairie, Que., with head office at Montreal, is the plant of the Leprairie Pressed Brick Company, considered the largest and best equipped of its kind in Canada, with very few to equal it on the North American Continent.

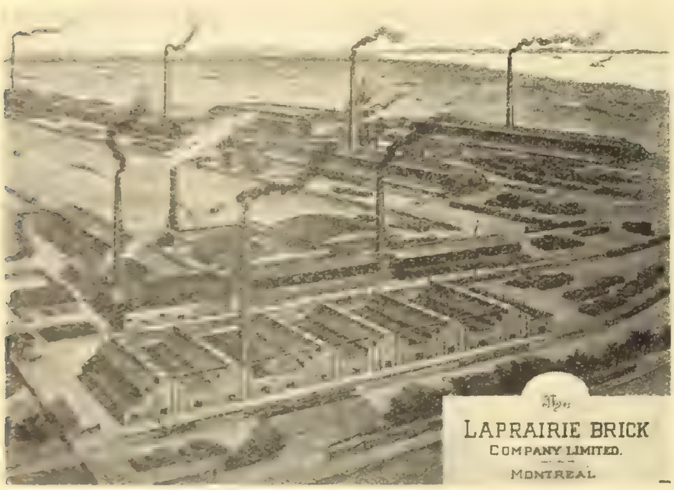
The company makes five kinds of brick, viz.:—red pressed, buff (patented), Roman, rustic (registered), and shale plastic (registered).

It is the only company in Canada to-day using shale entirely instead of ordinary clay, for all its raw material, and electricity as its principal motive power. The works consist of two plants, the older one steam-driven, the newer and larger driven by electric motor.

The steam plant has seven grinders, each weighing 32,000 pounds, with a total capacity of 500 tons of shale daily. The daily output of the company is now 300,000 bricks.

For the electric-driven plant the power is brought from Chambly, about fifteen miles from Laprairie. In it there are twelve grinders each weighing 32,000 pounds, with a total capacity of 800 tons of shale daily.

Some idea of the magnitude of the works may be gathered from the fact that it requires forty cars daily to bring the bricks from Laprairie to Montreal. The property is over 125 acres in extent, of which 12 to 15 acres are occupied by the plant alone. There are about four miles of heavy railway tracks in the yards and two miles of light tramways. Whenever possible, labor-saving devices, steam or electrically operated, are used. The result is that the company is able to sell plastic brick at such a low price per ton of material on board the cars at Laprairie that it makes it almost impossible for the common clay brick to compete.



Reverting to the recent discussion as to the prevalence of disastrous fires in Montreal, the company claimed that if the fire walls had been made of Laprairie "shale plastic" bricks, the insurance companies would not have had cause for such complaints, nor would the risks, from their standpoint, be rendered extra hazardous. They claim that these plastic bricks are the best ever made for fire purposes, practically smoke-proof, thus minimizing damage to adjoining buildings. They are practically the same material as was used in the old Roman walls, which have lasted for centuries and are more difficult to destroy than the best stone.

It is interesting to note the report of results of tests of two specimens of red brick for the Leprairie Brick Company, made in the laboratories of the Faculty of Applied Science, of the University of McGill. For the compression test, the specimen was tested on flat, the loading faces being prepared with plaster of paris. The dimension of specimen were 8.2" x 4" x 2.4"; the area 32.8 square inches; the weight 6.119 lbs. The load was 4,640 lbs. per square inch and the maximum load 215,600 lbs. In the absorption test, after being immersed in water for 48 hours, the weight of specimen before immersion was 5.998 lbs. and the weight after immersion 6.463 lbs., showing a gain of .464 lbs. or 7%.

In the "plastic wire cut shale brick" the gain in weight after being immersed in water for 48 hours was 121 lbs., or 2.1%, and in the compression test the maximum load in pounds per square inch was 15,000 pounds.

This is a test very rarely equalled and shows the superior quality of the product of the Laprairie Pressed Brick Company.

An Up-to-date Pressed Brick Plant At Sydney, N.S.

The plant of the Sydney Pressed Brick Company, Limited, Sydney, N.S., is situated at the junction of the Sydney & Louisburg and Intercolonial Railways, quite close to the Sydney passenger station of the latter railroad.

The bricks are manufactured from water granulated basic blast furnace slag, with a small proportion of slag cement as a bond. The slag is dried in a Ruggles-Coles dryer and then ground in a wet pan where the cement is mixed with it. The mixed materials are elevated to a hopper over a four-mold Berg press. After being pressed the bricks are cured in a steam cylinder, and treated in practically the same manner as silicate bricks. In fact, the process all through is quite similar.

The natural color, a light grey, is pleasing, and work done with bricks of the natural color and red or black joints is very effective. The bricks may be colored red or buff in the process of manufacture.

The special advantages claimed for the company's brick are:—(1) That they are turned out true in form and dimension; (2) That they make a strong bond with the mortar; (3) That they improve with age and changing atmospheric conditions.

The plant has a capacity of two thousand bricks an hour.

Brick moulds used in the manufacture of brick, no less than the machines, have undergone some radical changes in recent years. Under the old system, a single wooden mould with a loose bottom was used. The clay was placed by hand, pressed in and struck off with a knife. The introduction of the sanding machine has displaced this mould. Strength and accuracy are the main features in the manufacture of the sanding machine. One sixty-fourth of an inch in the depth of a mould would make a considerably difference in the manufacturer's output for a season. For example, 1-16 of an inch off the side of a million bricks would mean enough clay to make 15.625 brick 4 inches wide. The hard usage to which these machines are subjected necessitates the greatest strength in every detail of construction.

Messrs. Chapman & McGiffen, architects, Toronto, have been awarded first prize for their plans for the new Knox College. The award carries with it the commission for designing and superintending the erection of the proposed building. In addition to the first prize, three other prizes of $500 each were given to Wickson & Gregg, A. McKenzie Bryden and John M. Lyle, all of Toronto. Nine plans were submitted for the work, which will be begun probably next spring. The new building will cost $400,000 and will harmonize with the general design of the University of Toronto.

The Winnipeg Building Trades' Council are asking the Board of Control to frame a by-law looking to the safe construction and inspection of scaffolding.

A Progressive Brampton Industry

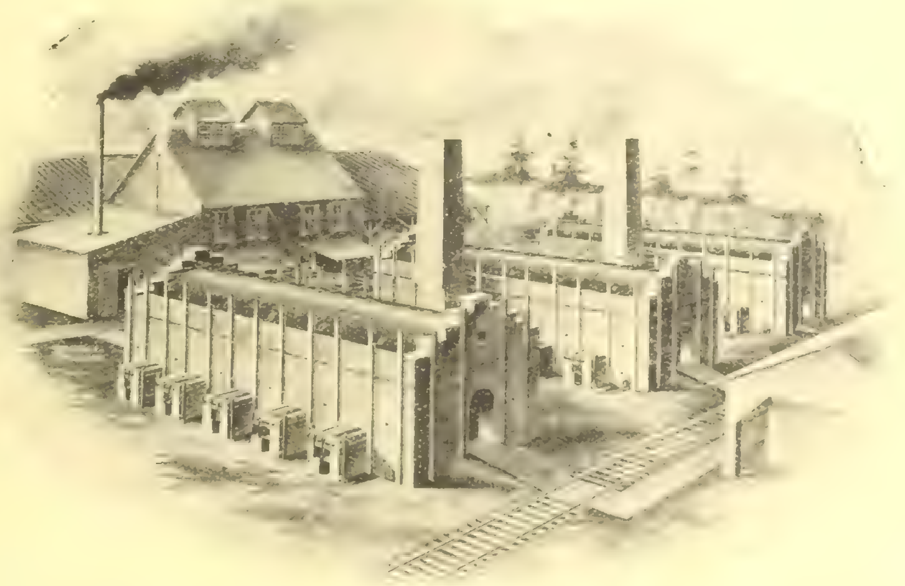
Twenty-two miles from the city of Toronto and just beyond the limits of the enterprising little town of Brampton are located the works of the Brampton Pressed Brick Co., Ltd., a view of which is published herewith. Mr. James Packham, the President of the concern, was formerly the sole owner of the plant. The demand for Brampton pressed brick increased rapidly, however, and Mr. Packham formed a company for the purpose of increasing the capacity of the plant and extending the market for its products. This was five years ago. At that time the company moved the plant to a new site consisting of 17 acres of red shale bank. Additions now being made include new Berg dry pans and a complete equipment for making vitrified paving brick, wire cut brick and all kinds of terra cotta, drain tile and so on. The transportation facilities possessed by the Brampton Pressed Brick Company are excellent, a C.P.R. siding running right into the works. The company's property is favorably located, high and dry, free from all drainage or soakage water. There is a practically inexhaustible supply of fine red shale extending from near the surface of the ground to a depth which has not yet been ascertained. The same quality is found 40 feet below the surfoce. The brick press is a recent addition to the plant. It is one of the four mold Boyd brick presses, manufactured by Chisholm, Boyd & White Co., Chicago. This machine occupies a floor space of 8 by 9 feet. It is about 6 feet high and weighs some 10 tons. Mr. Packham has evolved the last developments in the economical and systematic operation of his plant. The shale from which the pressed brick is manufactured is carefully selected, and then crushed in a heavy crushing machine and screened through an 18-inch mesh screen. The fine material is then fed into the molds of the press, from whence they are delivered automatically and taken direct to the kilns and set for burning. These kilns are permanently-walled up- draft kilns. The brick are burned in the ordinary way, first with wood, then by coal and wood, and finally by coal alone, the whole process lasting about two weeks.

Items of Interest

The recent excavations of the Roman Villa at Northfleet, England, have proven of immeasurable value to the antiquarian student. Among other important discoveries has been found the existence of an ancient ruin about two feet below the foundations of the present structure. Another valuable "find" is a large kiln built entirely of blocks of chalk lined with red clay, burnt through the process of firing to red brick. Buildings erected wholly or partly of blocks of chalk are to be found in the chalk district dating back to the Norman period, or even earlier, and Roman kilns built partly of chalk are comparatively common. This new kiln is uncommon, on account of both its material and its size.

The oldest temple in the world, so far discovered, says an exchange, has been unearthed by excavators at Bisya, in central Babylonia. The walls of the tower were first uncovered and the summit cleared. The first inscription on the surface was on a brick stamped with the name Dungi, which goes back to 2750 B.C. A little lower appeared a crumbled piece of gold with the name Param Sim, who lived in 3770 B.C. Just below were large square bricks peculiar to the reign of Sargon, 3800 B.C., who was probably the first Semitic king of Babylon. A large platform was discovered [illegible] yards below the surface, which was constructed of peculiar convex bricks such as were used in building [illegible] B.C.

Work on the Canadian Pacific bridge near the Place Viger Station, Montreal, will, it is expected, be started shortly. At present traffic is carried on over a stretch of land between the two excavations for the station yard. Eventually this land will also be removed, and a bridge constructed, which will reach from Berri to Montcalm streets. This viaduct will be 1,055 feet long. Already the foundations consisting of 900 concrete pedestals, with two massive stone abutments have been built, and in a few days they will be ready for the placing of the steel superstructure.



The Works of the Brampton Pressed Brick Company, Brampton, Ont.

History of Clay Sewer Pipe Construction

Early Methods of Manufacture Described—Discovery of Salt Glazing Process
Evolution of the Modern Product: An Impervious and Indestructible Material

By J. M. McClave, District Superintendent, American Sewer Pipe Company.

Since man began to multiply and replenish the earth, the matter of proper drainage has been an important factor in all construction, and a careful research of history reveals to us that vitrified clay products have held a place in the front rank for buildings and other structures.

That the primitive man used vessels made of clay for cooking utensils is proven by the many relics excavated from abandoned cities of ages past. That the prehistoric man used the vessels made of the same material is proven by many relics taken from the mound where they have lain for unnumbered centuries, still in perfect condition.

A noted traveller of many years' experience, writes: "Vitrified clay is among the most durable materials known. While the marble palaces, temples and tombs of Rome and other ancient cities have crumbled away, those built of brick made from clay, remain almost perfect.

"Drains constructed of tile have been found in Pompeii, Troy and Nineveh, also in Urr of the Chaldees, the home of Abraham and the oldest city in the world. Here it was in general use, even the ancient tombs being drained with clay pipe, which are now in as perfect condition as when laid over 4,000 years ago."

The temple of Jerusalem had a perfect sewerage system cut out of solid rock. The Cloaca of Rome has continually performed its duties as a sewer system for more than twenty centuries.

Before the art of forming cylindrical tubes or pipes from clay and burning them was discovered, wood, stone and, later on, brick, were no doubt used for drainage purposes. There is no definite record as to the time vitrified clay pipe was first used. England, Scotland and other European countries began to use them in the 17th century.

The method of manufacturing at that time was very crude, compared with the present day processes. A lump of clay was placed on a potter's wheel, and by holding the hand in the centre of the ball, and revolving the wheel, the mass of clay was gradually worked into a round tube. A few feet constituted a day's work. For a glaze, a fusible material known as "Slip" was put on the pipe which was put in a small oven or kiln and burned until the "Slip" had fused sufficiently to adhere to the body.

In the early part of the 18th century, it was discovered that common salt, put into the kiln when a heat sufficient to vitrify the clay had been reached, would form a glaze on the surface of the clay.

Discovery of the Salt Glazing Process

Tradition tells us that this process was discovered in the following manner: "A Scotch potter, near Edinburgh, Scotland, was firing a small oven or kiln of ware with peat. The poor potter had exhausted both his cash and his credit; the fuel had run out and the kiln was not finished. In his desperation he broke up an old barrel that was near by, and used the staves for fuel and in that way completed the burning of the kiln. When the ware was taken from the kiln it was found to be altogether different from what had been expected, and when it was taken to the market, the merchant was very much taken with its appearance and began to question the potter as to how he had obtained such results, but he was unable to explain. So anxious was the merchant to get the process that he returned with the potter to his humble home and had him go over he whole process. Finally, coming to the barrel stave part of the process, it was learned that an old salt barrel had been used to complete the burning, and the merchant naturally concluded that it was the fumes from the salt, which the staves of the barrel had absorbed, that produced the wonderful effect on the ware." Other experiments followed, and very soon the process of salt glazing came into general use.

History does not tell us whether the ancients used the "salt-glazing" process or not, but it is not likely that they did, for until late in the 17th century, salt was a very valuable mineral, so valuable, indeed, that some of the ancients used it as a medium of exchange in place of one of the precious metals.

The question of proper sanitary conditions is a very important one, and the sanitary engineer of to-day is ever alert for the proper methods and best materials.

Before a material for a sewer can be considered "first class," it must stand the following tests, viz., abrasion, acid and pressure. The cost of excavating and refilling is too great to take chances on a material that will not meet the above condition, to say nothing of sickness and death caused by improper sanitary conditions.

Nature has distributed clay freely throughout the earth, but has been rather economical in distributing the ingredients necessary for the manufacturing of a material to meet the requirements heretofore mentioned. These must contain a large proportion of silica and alumina silicate and have a very low percentage of iron, sulphur, carbon and alkalies.

Modern Developments

For many years in the early history of our country, what sewer pipe was used was imported from Scotland and England. Some pipe was made in New York and New Jersey in the first half of the 19th century, but the rapid development of the sewer pipe business, like many of the other great industries, was left for the last half of the 19th century.

The late Mr. David E. Hill, who for fifty years was one of the leading factors in the business, was interested in the manufacture of sexangular clay water pipe, at Akron, Ohio, in 1849 and 1850, had become acquainted with the use and need of sewer pipe made from clay and the great possibilities for its future. After considerable prospecting, the necessary clay was found in the hills east of the city of Akron, Ohio, and in 1851 he began to manufacture the standard Akron shale sewer pipe. About two years later, Carlyle and McFadden located a factory at Newburg, now Toronto, Ohio, and began the manufacture of Ohio River fire clay sewer pipe. Thus began a business that to-day amounts to several million dollars per year.

Like all other industries the means for manufacturing improved as the demand increased, and the potter's wheel gave way to the mould and auger. This in time was succeeded by the screw press. These machines only made band or ring pipe. The socket, or bowls, were made by hand and stuck on. During the next ten or fifteen years, plants were erected in Boston, New York, Baltimore and St. Louis.

In 1868 quite a change was made in the method of manufacturing, when David E. Hill and Ozias Barber perfected the first steam press, and about the same time a die that would make the socket on the pipe. This machine was a great step in advance of anything that had been invented, and, in a few years, was in general use by those already in the business.

The clay is procured either by removing the loom and rock, by drafting into the hill and mining, or by sinking a shaft to the clay and mining and hoisting it. The next process is to pulverize the clay in a dry pan, which is usually eight or nine inches in diameter, having a circular bottom which revolves and, at the same time, revolves two large iron meullers. The clay is thrown into this pan as it comes from the mine, where it is crushed and passed through the sifting plates in the bottom of the pan to the bucket elevators; then it is elevated 40 or 50 feet and thrown on to a screen, which it passes over, the dust going into a bin and the uncrushed part returning to the dry pan. From the bin the dust is conveyed to the wet pan, where sufficient water is added to render the mixture about like putty. It is again elevated and conveyed to the clay cylinder attached to the steam press. Steam is then turned on and with a pressure of several tons the clay is forced through the die which forms the pipe.

The pipe is made in lengths of 2 feet, 2½ feet and 3 feet, and taken to dry floors which are heated to a proper degree. There it remains until it becomes hard enough to handle without breaking, which is from four to six days. It is then taken to a kiln, which is usually of the circular down-draft type, made of brick and 30 to 40 feet in diameter. The pipe is placed in the kiln in stands from six to eight feet high, the smaller sizes inside the larger. When the kiln is filled, the door is built up and plastered over with clay, and a fire is built in the fire mouths of the kiln, which consist of eight to twelve openings at equal distance apart around the kiln. The fire burns very slowly at first and is gradually brought up to a heat from 2,300 to 2,500 degrees Fahrenheit. At this temperature the body of the pipe is vitrified and ready for salt, which is thrown into the fire mouths. The fumes arising therefrom pass into the kiln. That of the chlorine, passing out through the stack of the kiln, and the sodium fumes coming in contact with the molten silica, form a glass or glaze on the pipe. The kiln is allowed to cool gradually for four or five days, so as to properly anneal the pipe. The pipe is then taken from the kiln and is ready for use. By the foregoing process an absolutely impervious and indestructible material is produced.

Mainly about the Brick Industry

By and by conservation will apply to clay banks as well as to trees, and some day we will learn that our clay banks are even worth more to us than our timber resources.

After you figure up the amount of your kiln waste during the past season, you may then be able to spend a little time profitably preparing ways and means to reduce it next year.

A good idea is not only to plan this winter for pushing clay products more extensively next year, but also do some mission work among dealers in building material and work them into a boosting spirit, too.

There are other things to save in the manufacture of brick besides labor; and a dollar saved on the coal bill, on oil, or tools used about the works is just as big a dollar as if saved on labor.

The Port Credit Brick Company, Port Credit, Ont., has begun work on the erection of a wider bridge over the Credit river at the Lake Shore road. The present structure, a bridge 30 feet wide, is far too small for the amount of traffic it carries, and it is the company's plan to widen it about 25 feet more. To assist in the work a tug and a couple of scows have been brought from Toronto. A large quantity of scrap iron and earth is being removed, and soon everything will be ready for the bridge. In order to eliminate the grades on either side of the bridge it will be raised about four feet and the space filled with earth.

According to the public works report submitted to the city council of Calgary, Alta., last week, there are now 19.06 miles of water main in the city, 19,327 feet having been laid this year; 253 water connections have been made during 1910, making a total of 1,189 connections. The total sewer connections number 1,193, the number for the first 11 months of 1910 being 253. The total number of miles of main sewer is 20.25 and the mileage laid this year is 11.83.

Montreal Reports Good Season

Close of Record Year Notable for Promising Outlook and Prospects of Even Greater Prosperity

Montreal Office of the Contract Record,
December 17th, 1910.

Conditions in the building and allied trades generally, are quiet in Montreal and vicinity just now. Contractors and supply men are getting a little breathing space after their tremendous exertions of the period just closed. Taking it all round, there has never before been such a boom in building of all kinds as during the past summer. True, trouble was experienced with the bricklayers and stonemasons, but this was only temporary and did not hold up any of the big jobs to any extent.

The outlook for next season is bright and promising. Many big works are to be undertaken when spring comes, and contracts for most of these will be let during the winter months. It is rumored that several modern steel construction office buildings will be erected on St. James Street, while Mr. Frank Truaisch and Freeman's, Limited, will have two large restaurants under way.

The Foundation company is pushing the work on the excavation and foundation for the new C.P.R. office building at the corner of St. James and St. Francois Xavier streets, on the site of the old St. Lawrence hall.

Blick dealers report the close of the best season in their history. Day and night their plants have been in operation in an endeavor to keep up with the abnormal demands, and it is only in the last week or two that any of the plants have been able to discontinue the night shift.

Building Inspector Chausse is coming in for considerable criticism for his stand in connection with the Forum, a large wooden building on St. Catherine street west used as a skating rink, bowling alleys, restaurant, etc. It is alleged that this building is constructed contrarily to the building by-laws and the inspector declares that he has not the authority to order its demolition. The board of control is dealing with the matter at present.

A permit has been taken out at the city hall for the construction of the new Montreal Art Gallery at the corner of Sherbrooke street and Ontario avenue. The contractors are the George A. Fuller Company, of New York, who are at present erecting the Chateau Laurier for the Grand Trunk Railway at Ottawa. The architects are Messrs. E. W. & S. Maxwell. Specifications call for a handsome three storey building, sixty-four feet high with a front of 139 feet. The porch will be supported by four Doric columns, and the front wall will be of granite and marble. Within, on the gallery floor, will be nine galleries and a large exhibition hall. School rooms and reading rooms will occupy the floor above. The estimated cost of construction for the present is $300,000, although the full plans call for a structure twice as large as will be built just now, and costing in proportion. Ground will be broken shortly.

In connection with the projected building of the new art galleries, the hope was expressed locally that the beautiful marble of Missiquoi county would be used, but the Canadian tenderers were from $18,000 to $30,000 higher than the United States firm who were awarded the contract. It has been decided to use Vermont marble for the construction of the building.

It is expected that the alterations and new buildings of the C.P.R. at Place Viger station will be completed by June next.

Work is proceeding rapidly on the structural steel work of the new annex to the Windsor station of the C.P.R. It is the intention of the Dominion Bridge company to carry on operations all winter, in which case if the present speed is kept up, the entire skeleton of the building will be in position by the end of April. The reinforced concrete work is also being pushed towards completion, about 500 cubic yards having been laid up to date.

A deputation from the Chambre de Commerce visited Ottawa to urge on to the Premier the early construction of the Georgian Bay canal, and to voice their remonstrances against the proposed deepening of the Welland canal. They were accorded a favorable hearing by Sir Wilfrid.

Judgment has been rendered by Justice Fortin in a case of vital interest to contractors and others interested in building operations. The action resulted from a claim for extras by the contractors, Messrs. John Quinlan and Company, in connection with the erection of the Redmond building, in this city. During the course of building operations, Messrs. Quinlan and Company were verbally ordered by the architects to make certain changes in the original intentions, requiring extra work to be done by them. This they did, but it eventually turned out that the proprietor was in ignorance of the whole matter of extras, and refused payment of the bill. The architects acknowledged in writing to the contractors having given the instructions, but held that the charges were too high, reducing them a certain amount. In effect the judgment rendered nullifies the instructions of the architects for extra work without knowledge of the proprietors, and this point will have a direct bearing on many contracts now being completed. This is the most interesting phase of the judgment handed down, in the opinion of local contractors.

Items of Interest

Bids will shortly be called for the erection of a modern high-class restaurant building in the heart of Montreal's business district, as the result of an important real estate deal that has just been consummated. Mr. Frank Truaisch has bought the land and buildings at 235 to 237 St. Thomas street, now occupied by the Stewart Shoe store and the Semi-Ready Company, respectively. The property was purchased from the Molson estate, and the price is stated to be $50.000 and other valuable consideration. The land extends right back to Fortification Lane, and has been in the possession of the Molson family for over half a century. It is understood that Mr. Truaisch will order the demolition of the present buildings around May 1st next, when he will immediately start the construction of a modern high-class building. It is understood that the new building will be of an imposing nature and that competitive plans will be asked by the owner.

The city council of Sherbrooke, Que., at its regular monthly meeting passed a motion authorizing the expenditure of $2.000 for the year 1911 to assist in carrying on a campaign for a Greater Sherbrooke. With the money already raised by the citizens, this means that Sherbrooke will now have $6.000 a year with which to advertise the city and attract industries.

The plans of the Grand Trunk Pacific for their grain terminal on the Mission River at West Fort William provide for the construction of three large piers devoted to the grain trade. Along these piers a series of half a dozen elevators will be built. The first of these with a capacity of three and a quarter million bushels has now been completed and is being filled with grain.

The foundations of a large shirt factory for the firm of Cluett Peabody, of Troy, N.Y., have been started at St. John, Que. The city has granted them a free site.

Stanstead granite has come to be known all over the continent, and has attracted the attention of American capitalists. A company has been organized at Coaticook, Que., under the firm name of the Frontier Granite Company, which has installed works on the line and secured an immense quantity of this granite at Stanhope, Que., and Norton Mills, Vt. It is said that this granite, while, of course, not equal to that of Beebe Plains, which has made this section so well known, is of a marketable quality and worthy of being offered for sale for building purposes. As the raw material can be secured from either side of the line, shipments can be made into the United States and into Canada from the same building.

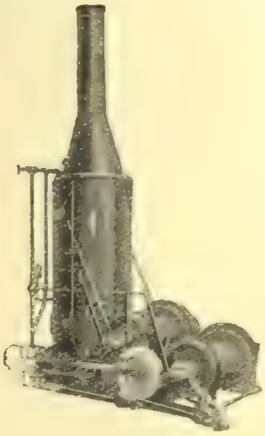
An action for the cancellation of a $142,000 contract for a school house in Maissoneuve has been entered in the Superior court at Montreal. The plaintiff, who is a ratepayer of the town, alleges that a profit sharing contract has been given to a favorable contractor of the town. Two of the school commissioners are named as receiving part of the contract money. Attorneys for the plaintiff declare that the granting of the contract was a conspiracy between members of the Commission. The case will be heard at the next sitting of the court, which will be after the holidays. It is attracting much attention in the building trades.

A Prominent Ontario Brick man

Mr. J. S. McCannell, one of the best known brick men in Ontario, was born 45 years ago at Acton, Ont. He was educated at the high school at Vankleek Hill, after which he went to Montreal, where he became identified with the wholesale dry goods firm of James Johnston & Co. He remained there for some little time and married the eldest daughter of Dr. Robertson, ex-M.P.P. for Halton. Some little time afterwards—some 21 years ago—J. S. launched into the brick business, with his father-in-law as president of the company. He was under the impression at that time that taking shale out of a bank and manufacturing it into brick was quite as lucrative a business as running a gold mine, but it was not long before this idea was rudely dispelled. Adversity threatened, and several brick plants went to the wall, but thanks to the ambition and untiring energy of Manager McCannell, Milton brick pulled through. When Mr. McCannell went into the brick business he kept one purpose steadfastly in view—to give Milton pressed brick a reputation unexcelled in Canada. The measure of success he has met with may be estimated by the excellent results obtained in recent years.

Mr. J. S. McCannell

While J. S. is enthusiastic over his business, he is not a slave to it. He has a family of five and a beautiful home



Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."

—The Philosopher of Metal Town.

"METALLIC"
Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers 1954

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Scandinavia Belting
for Conveying and Transmission

Made in widths up to 66" and in four thicknesses.

Equally good in WET and DRY places.

Is not made in plies and cannot come apart.

Write for Bulletin "B" and discounts.

Federal Engineering and Supplies
Limited
284 Yonge Street - TORONTO

Agencies
Montreal, Power Economics Ltd. Ottawa, McDougall's Limited
Pt. Arthur, Marks-Clavet-Dobie Ltd. Calgary, Great West Saddlery Co.
Cobalt, Geo. Taylor Hardware Co.

Agents Wanted in Other Cities.

with eleven acres around it. Like all other good men, he has a hobby. In his case it is horses and cattle. And J. S. is no more half-hearted in his hobby than in his brick business. He has several good drivers and a herd of about fifty of the finest bred Holsteins in Canada. He works over 300 acres of land.

Two years ago J. S. McCannell was president of the Canadian Clay Products Manufacturers' Association. He does everything in his power to promote the interests of his trade and is a worker from the word "go."

Personal News and Notes

Mr. E. A. Evans, chief engineer of the Quebec Railway, has resigned.

Building permits issued at Winnipeg so far during 1910 total over fifteen million dollars.

Mr. Chas. W. Mitchell has resigned as general superintendent of the Dominion Iron and Steel Works, Sydney, N.S.

Mr. George H. McGougall has been appointed mechanical superintendent of the Dominion Steel Corporation, at a salary of $9,000 per annum.

Mr. F. Neill Brodie, architect, St. John, N.B., left recently for Boston, N.Y. While in the latter city he attended the big cement show in Madison Square Garden.

The Grand Trunk station at Richmond, Que., was recently destroyed by fire, which originated from unknown cause. It will be rebuilt in the spring.

The city council of Vancouver have decided to take a plebiscite next month as to whether new buildings shall be limited in height to ten storeys.

Mr. W. G. Van Egmond, of the well known architectural firm of Storey & Van Egmund, Regina, Sask., read an interesting paper on Grecian and Roman Architecture before the Regina Arts Society last week.

A Calgary dispatch announces the appointment of Mr. C. W. Peterson to the position of superintendent of irrigation for the C.P.R., made vacant by the recent elevation of Mr. J. S. Dennis to executive duties.

Mr. E. McGaffey, secretary, Vancouver Island Development League, was one of the delegates to the convention of the Oregon Good Roads Association, which opened at Portland on December 12.

Mr. Joseph M. Bourke, civil engineer, has been appointed by the Temiskaming & Northern Ontario Railway Commission to take charge of building the Provincial railway from Kelso into Porcupine, as decided recently by the government. His head office will be North Bay.

A feature of a busy year at New Westminster, B.C., has been the increased amount of contract work awarded under the direction of City Engineer Blackman. The total construction of this kind, let and under way, represents a value of nearly half a million dollars.

The new bridge on the St. Guillame division of the C.P.R., at Farnham, Que., is practically completed. The piers, which are of concrete, were built during the summer, while the spans were put in place one or two or a time, causing no delay to traffic.

Building permits issued last month at Montreal represented a total value of $905,427, compared with $479,540 for November, 1909. For the eleven months of the current year the permits are valued at $14,871,042, as against $7,622,236 for the corresponding period of last year.

Mr. W. P. Robinson, of Detroit, has opened an office in Toronto as representative of the Northern Engineering Company, makers of overhead travelling cranes. Mr. Robinson will also handle the output of the American Electric Fuse Company of Muskegon, Mich., and the Hoover-Owens Rentschler Company, of Hamilton, Ohio.

The action of Mr. E. J. Lennox, architect, against the city of Toronto is being set down for trial. Mr. Lennox is endeavoring to recover $208,093, with interest, in connection with the design and erection of the city hall carried out under his supervision.

A cablegram from Buenos Ayres last week announced the death of R. B. Ross, civil engineer, representative of the Marine Signal Company, Ottawa. The late Mr. Ross was a graduate of the School of Practical Science, Toronto. He was 26 years of age and had been living at Buenos Ayres for two years.

We understand that the annual convention and exhibition of the Canadian Cement and Concrete Association, which was announced to take place the third week in January, has been unavoidably postponed. The meeting will probably be held early in March, but a definite announcement will be made later in these columns.

Mr. J. H. Corbett was a visitor to Ottawa last week. Mr. Corbett with his partner, Mr. J. Floesch, has just completed the fifty miles of the National Transcontinental Railway out of Moncton, N.B. Before leaving Moncton the town paid a tribute to the contractors in the shape of a banquet, presided over by Mr. C. W. Robinson.

The Grand Trunk Railway has negotiations under way for the purchase of land on the Canadian side of the Deroit River. If the negotiations go through the company will build a line from the yards in Windsor, Ont., around to the Michigan Central terminal station and make a connection somewhere near there with the Michigan Cenral tunnel.

The city council at Victoria have been asked to strike out from the conditions for paving work the clause which compels successful tenders to leave 15 per cent. of the contract price in the hands of the city for a period of ten years. No final decision has yet been reached in the matter, but in view of the fact that the city engineer is strongly opposed to such cancellation, it is not likely that the contractors will be successful.

The Montreal Board of Control have recommended that Mr. Geo. Janin, superintendent of the water department, be appointed city engineer. City Surveyor Barlow will remain at the head of the roads department. Mr. Stuart Howard, Mr. Barlow's assistant, will be known as superintendent of the sewer department, while Mr. T. W. Lesage, Mr. Janin's assistant, will be superintendent of the waterworks department.

Mr. A. H. N. Bruce has made a preliminary survey of the proposed route of the electric railway from Ottawa to Kingston, following approximately the course of the Rideau canal. From this city to about 20 miles south of Smith Falls the route is over comparatively level country, but from there to Kingston the course will be much rougher. Mr. Bruce states that he will recommend that a line capable of competing in freight handling as well as passenger work be built. This, of course, would be much more expensive than the ordinary trolley lines, built for passenger traffic only.

The new annex now being built at the Windsor street headquarters will have a sixteen-storey tower, rising 280 feet from the foundations to the top of the flag-staff. Rapid progress is being made on the work, and over a thousand tons of structural steel have already been rivetted up. Five hundred men are engaged, and steel is being placed at the rate of 300 tons a week. Work will continue all winter, and it is expected that the steel will be finished by April, when the stonework will be started. It is expected that the whole work will be finished by the end of 1912, when the station will be one of the big railway terminals of the world.

THE
MILTON
PRESSED BRICK Co.
LIMITED

MPB Co

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

The Consolidated
Stone Company
Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

BEDFORD STONE

The Celebrated
Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.
Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

Do You Think
that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy
or any kind of
Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

Tenders

For Roofing and Sheet Metal Work

in all parts of Canada

Communicate with

A. Schwoerer & Sons, Inc.

530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Office and Warehouse
Yonge St. & C.P.Ry.
North Toronto

Write for booklet

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Granite Marble Tiles Slates

Ceramics
Marble Mosaics
Marbleithic Tiles
Wall Tiles
Quarries

We carry a stock of above materials in Montreal and are prepared to supply the trade at lowest prices.

The Smith Marble & Construction Co.
Limited
The Calkins Tile & Mosaic Co.
Limited
458 Bleury Street, MONTREAL, QUE.

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

THE WARMEST SHEATHING—WIND AND FROST PROOF

Not a mere felt or paper but a matted lining that keeps out the cold as a bird's feathers do. Incomparably warmer than common papers. Warmer and one-half cheaper than back plaster. Costs less than 1 cent a foot, and pays for itself in two winters by saving coal Send for a sample—free—of

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS:
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Established [illegible]

THE COMMERCIAL

The weekly financial, commercial & general trade newspaper of the great West.

Winnipeg, Manitoba

Port Credit Brick

Wire Cuts and Repressed

Wire Cuts and Pressed Brick

Hard Builders for Cellar Work	**Dark Faced Red Pressed Brick**
	Light Face Brick
Second-Class Brick for Inside Work	**Special Dark Face Veneer Brick**

Our plant has recently been enlarged in such a manner as to enable us to supply these lines to the very best advantage.

We have now one of the finest plants in every particular in America

"Brick," the leading clay journal of the United States, in its January number, says of our plant:

> "When completed the plant will be one of the largest and best arranged plants in America, and anyone who desires to see a modern, well built and well designed plant in operation, a trip to the location would not be amiss."

Prices Furnished on Application.

Port Credit Brick Co.

Limited

Home Bank Building, 8 King Street, W., Toronto

Works: Port Credit, Ont.

Office Phone, M. 3167 Yards Phone, Col. 4853

Dry Pressed Brick

"Canadian" on every Brick

We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co.

Limited

Phone 423 and 2457

HEAD OFFICE:

Room 36, Federal Life Building, HAMILTON, ONT.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works: Kirkfield, Ont.

Head Office: 47 Yonge St. Arcade, **TORONTO**

Phone Main 4516 G. W. ESSERY, Manager

Portland Cement

High Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt & Co. Engineers

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St Louis

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.

Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Office:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

——Bridge and Construction Dep't.——

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

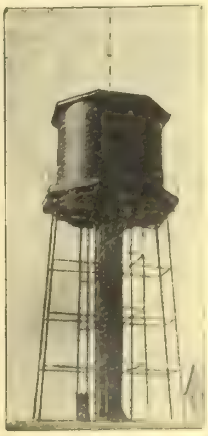
Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.



Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors plant

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.

Limited

Civil and Mechanical Engineers, Manufacturers, Contractors.

Head Office and Works:
Drummond Street - - SHERBROOKE, QUE.

The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., **TORONTO**
Office Phone P. 64 Residence P [illegible]

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

White Lime, Stone, Grey Lime, Brick, Drain Tile.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

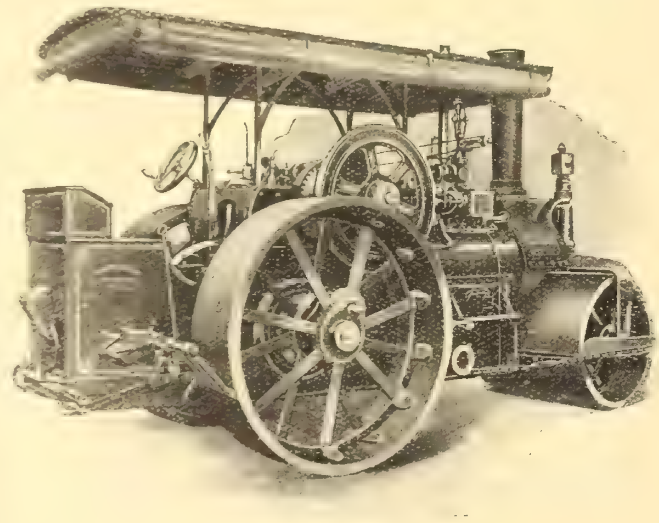
CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.



" A Canadian Roller for Canadian Roads "

A little Roller Talk—

Progressive Municipalities are realizing more and more, that in the construction of a really good, permanent roadway, a first class Steam Roller is indispensable.

The Waterous Double Cylinder Steam Roller comes under this head

It is adaptable as a Rock Crusher. Can be used to haul road metal. In the different operations of road building from rolling the sub-grade to the final road trimming, the Waterous Roller does the work better, faster and cheaper and leaves a finished road that costs less and lasts longer than one built any other way.

LET US SEND YOU OUR NEW 20 PAGE BULLETIN.

The Waterous Engine Works Co., Ltd. Brantford, Canada

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

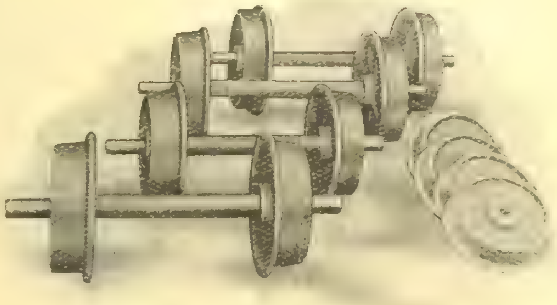
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que.
Hamilton, Ont.
Three Rivers, Que.
Midland, Ont.
Londonderry, N.S.
St. Thomas, Ont.
Fort William, Ont.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main [illegible]

The
Roofers Supply Co.
Limited

- Roofing Slate
- Red Slate
- Green Slate
- Mottled Slate
- Black Slate
- Blackboards Slate
- Structural and Electrical Slate
- Terra Cotta Tiles
- Asphalt Pitch
- Tar
- Asbestos Sheathing
- Building Papers
- Tarred Felts
- Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

- Glass Wired and Rough Rolled
- Galvanized Sheets
- Black Sheet
- Copper Sheet
- Tinplates
- Canada Plate
- Zinc Sheets
- Corrugated Iron
- Gutters
- Pipes
- Elbows
- Spikes
- Nails
- Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.

Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

JAMES TAYLOR Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50
Brass Goods, Valves, etc.		
96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 65 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 80 per cent. off; lead waste, 80 per cent. off; caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	[illegible]
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 60 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto. bags extra, $1.90.

Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.65.

Cement, car lots, f.o.b. Toronto, bags extra, $1.70

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $14 to $15 per toise.

Free stone delivered, 14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $5.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, $1.05 per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

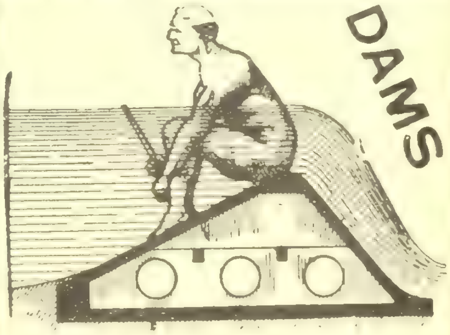
Sierra Madre Paper Co., Ltd., Toronto Ont. Capital, $5,000,000. Incorporators, James Steller Lovell, accountant; William Bain, bookkeeper, both of Toronto.

Mercantile Lumber & Supplies Co., Ltd., Montreal, Que. Capital, $50,000. Incorporators, Peter Eli Brown, gentleman, and Ernest Edward Kent, dentist, of Ste. Anne de Bellevue.

Bishop Construction Co., Ltd., Montreal, Que. Capital, $500,000. Incorporators, [illegible], all of Montreal, Que.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock
Office and Works
Phone M [illegible] 64 Esplanade, E. TORONTO

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company
of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q

Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.
The
Katie
Foundry,
Galt, Ont.
Municipal
Water Pipe,
Service Boxes,
Manhole
Frames,
Crossing
Plates,
Special
Castings

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or
Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

Fine Woodworking

INTERIOR FINISH
in
QUARTERED OAK, CYPRESS, YELLOW PINE, BIRCH, ETC.

S. Anglin & Company
Kingston, Ontario

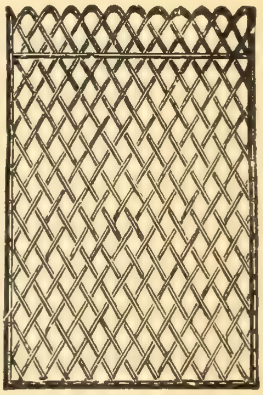
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

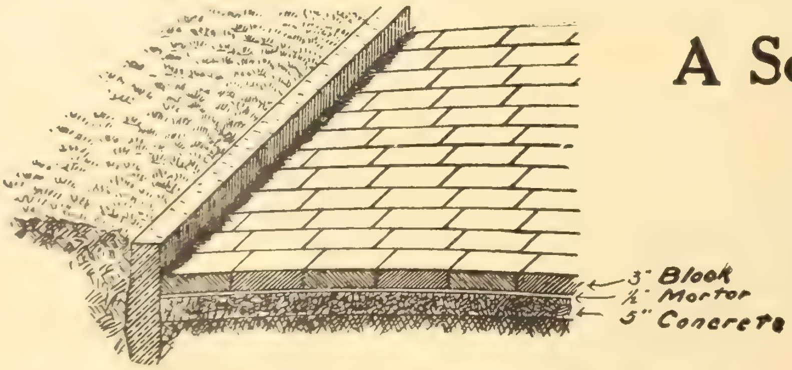
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co.,
Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

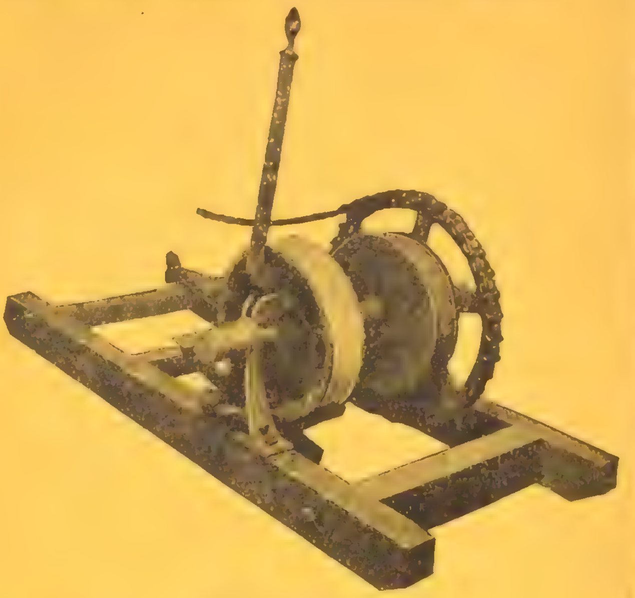
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, its officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

1200-1210 Morton Bldg. - CHICAGO, ILL.

We Manufacture

Frames - Sash - Doors

House Trim Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario

"Some Equipment With Merit"

FOR THE CONTRACTOR

"Kilbourne & Jacobs" Pressed Bowl Wheelscrapers

are the very best that can be purchased anywhere. They are the only perfect wheelscraper. The Best, strongest and easiest working Scraper ever put on the market.

We carry a full stock of all sizes for immediate shipment

"Columbus" Scraper

"K & J" DRAG SCRAPERS

In all sizes

"Boss" Scraper

Our scrapers are the leading drag scrapers everywhere. All our scrapers are absolutely seamless throughout and are superior to any others upon the market.

We want your inquiry when in the market—Prompt shipment from stock

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec　Dunn Bros., Winnipeg　Ritchie Contractors Supply Co., Vancouver

Vol. 24 Toronto, December 28, 1910 No. 52

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Power and Steam Pumps
Condensers, Travelling Cranes, etc.

WRITE FOR CATALOGUE

The Smart-Turner Machine Company
HAMILTON, CANADA Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

Large Bent Plate Glass for Shop
Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works : Don Speedway
Bending Works : 209-213 Victoria Street, TORONTO

Rand Quality Machines

AIR COMPRESSORS
ROCK DRILLS
HAND HAMMER DRILLS
TEMPLE ELECTRIC-AIR ROCK DRILLS
CALYX DIAMONDLESS CORE DRILLS
SUBMARINE ROCK DRILLS
SHEET PILE DRIVERS
DRIFT BOLT DRIVERS
IMPERIAL SAND or CONCRETE RAMMERS
IMPERIAL RIVETTERS
COMPRESSED AIR PUMPING SYSTEMS

Every machine here mentioned has back of it not only a record of success but the reputation of the largest pneumatic machinery manufacturers in Canada.

CANADIAN RAND CO., LIMITED
Commercial Union Building, MONTREAL, QUE.
Toronto Cobalt, Winnipeg, Rossland, Vancouver, Halifax

Machine Banded Wood Stave
WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One half the cost of Iron Pipe and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.

WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Structural Steel Building

We are builders of Steel Girders, Roof Trusses, Towers and Structural Steel work of every kind. Our Steel Shops are well equipped with Modern Machinery, so that we can handle your orders with accuracy and promptness.

Tell us your requirements and give us an opportunity of figuring with you.

The Jenckes Machine Co., Limited

General Office: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

Every

Luxfer-Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend "**Luxfer-Prisms**" every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Canada Cement Company

Limited

MANUFACTURERS OF HIGH GRADE

PORTLAND CEMENT

Mills at

Montreal, Que.
Hull, Que.
Marlbank, Ont.
Belleville, Ont.
Lakefield, Ont.
Port Colborne, Ont.
Owen Sound, Ont.
Calgary, Alberta

Head Office :

Montreal

Sales Offices :

Montreal
Toronto
Winnipeg
Calgary

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work

	Page
Canada Wire Goods Mfg. Co	19
Dennis Wire & Iron Works	19

Air Compressors

Escher Wyss & Co	

Belting

Federal Engineering & Supplies, Ltd	49

Boiler

Case Threshing Machine Co	11
Inglis, John	22
Jenckes Machine Co	2
Leonard & Sons, E	49
Marsh & Henthorn	49
McDougall Caledonian Iron Works	20
Mussens Limited	30
Taylor-Forbes Co	15
Waterous Engine Works Co	

Brick

American Enamelled Brick Co	
Canadian Pressed Brick Co	15
Don Valley Brick Works	7
Hamilton Pressed Brick Co	10
Milton Pressed Brick Co	
Port Credit Pressed Brick Co	15
Toronto Pressed Brick Co	

Bridges (Steel)

Canadian Bridge Co	52
Cleveland Bridge Co	52
Dickson Bridge Works	
Dominion Bridge Co	52
Phoenix Bridge and Iron Works	53
Pennsylvania Steel Co	52

Builders' Hardware

Tavlor-Forbes Co	

Cement

Alsen Portland Cement Co	58
Britnell & Co	18
Bremner, Alex	55
Canada Cement Co	3
McNally & Co., W	51
Morrison & Co., T.A	56
Rogers, Alfred	4
Rogers Supply Co	29

Conduits

	Page
Conduits Co., Limited	55

Concrete Pipe

Lock Joint Pipe Co	

Concrete Mixers and Machinery

Canada Foundry Co	10
Cropp Concrete Machinery Co	6
Hopkins & Co., F., H	60
Jenckes Machine Co	2
London Concrete Machinery Co	21
Mussens Limited	30
Morrison & Co., T. A	56
Rogers Supply Co	29

Concrete and Steel Reinforcements

Ambursen Hydraulic Construct'n Co	57
Canada Wire Goods Mfg. Co	19
Hamilton Iron & Steel Co	
Trussed Concrete Steel Co	54

Contractors' Plant

Beatty & Sons, M	19
Hepburn, John T	32
H. & E. Lifting Jack Co	
Hopkins & Co., F.H	60
Katie Foundry Co	57
Marsh & Henthorn	49
Mussens Limited	30

Crushers (Stone and Rock)

Case Threshing Machine Co	11
Hopkins & Co., F. H	60
Jenckes Machine Co	2
Mussens Limited	30
Morrison & Co., T. A	56

Corrugated Iron

Galt Art Metal Co	
Metallic Roofing Co	49
Metal Shingle and Siding Co	20
Ormsby, A. B., Limited	5
Roofers Supply Co	55

Contractors

	Page
McIlwraith, Jas. A	56
Nadel & Adler	56

Drills

Beatty & Sons, M	19
Canadian Rand Co	1

Deafening Felts

Cabot, Samuel, Inc	51

Drilling Contractors

Harvey, J	57

Dredges

Beatty & Sons, M	19

Engines

Case Threshing Machine Co	11
Canadian Boving Co	
Inglis, John	22
Jenckes Machine Co	2
Leonard & Sons, E	51
Mussens Limited	30
Waterous Engine Works Co	

Engineers (Civil and Mechanical

Barber & Young	56
Chipman & Power	56
Bowman & Connor	56
Farmer, John T	56
Fuce, Edw. O	56
Galt Engineering Co., John	56
Glaubitz, H. J	56
Hunt & Co., Robt. W	51
Inglis, John	22
Kennedy, Jas. C	56
Lea & Ferguson	56
Mace, T. Harry	56
Mitchell, C. H	56
McRae, John B	56
Moore & Scollan	56
Taylor, James	56

Fire Apparatus

	Page
Morrison & Co., T. A	56
Seagrave, W E	53

Fireproof Doors and Windows

Douglas Bros	14
Mussens Limited	30
Ormsby, A. B	5

Gauges, Steam, etc.

Marsh, Jas. P	1

Granite and Marble

Laurentian Granite Co	56
Missisquoi Marble Co	
Rogers Supply Co	29
Smith Marble & Construction Co.	

Glass

Chance Brothers & Co	12
Consolidated Plate Glass Co	
Luxfer Prism Co	2
Thompson & Co., B. & S. H	12
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co	2
Leonard & Sons, E	51
Tavlor-Forbes Co	15

Hoisting Machinery

Beatty & Sons, M	19
Inglis, John	22
Jenckes Machine Co	2
Hopkins & Co., F. H	60
London Gas Power Co	59
Marsh & Henthorn	49
Mussens Limited	30

High Pressure Pipe Lines

Escher Wyss & Co	

Hydrants

Canada Iron Corporation	57
Gartshore-Thomson Pipe Co	56
Kerr Engine Co	

Interior Fittings

Lickleys Limited	53

Lime

Christie, Henderson & Co	17
Jamieson Lime Co	53

(Continued on page 6.)

Portland Cement

Plants :—Durham, Ont.
Hanover, Ont.
Orangeville, Ont.
Owen Sound, Ont.
Wiarton, Ont.
Kirkfield, Ont.
Atwood, Ont.

Write or phone for prices. Shipments to any part of Ontario or the West.
Prompt Service. - - - - Splendid Railway Facilities.

ALFRED ROGERS, PRESIDENT

Alfred Rogers Limited

PHONE MAIN 4345 **Elias Rogers Building, TORONTO**

MODERN.

STRONGER.

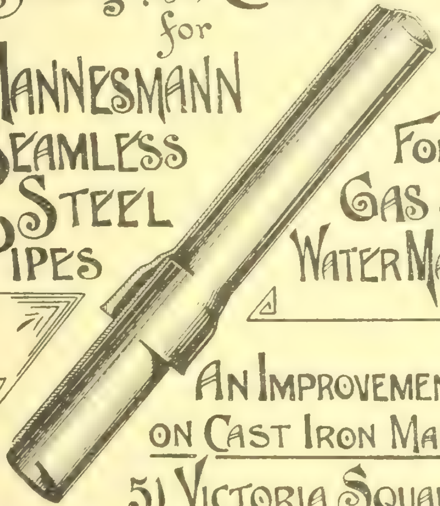
CHEAPER.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES



FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE,

MONTREAL.

MADE UP TO 40 FEET IN LENGTH.

RELIABLE

Semi Steel Fittings

RETURN BEND

PIPEHANGES

Y BRANCH

REDUCER

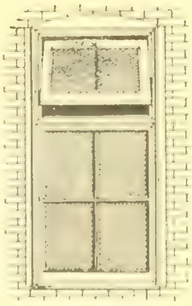
HEADER

CROSS

A fitting for every purpose
TRY THEM

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

It's Like an Auto



It isn't the first cost, but it's the upkeep that counts. The big unavoidable upkeep in buildings is Insurance. Specify FIREPROOF WINDOWS and DOORS for your openings and you have a fireproof asset against the wooden articles that are a liability, insurance increasers and kindling for a fire. "Underwriters" goods are really fireproof. Specify them. Manufactured by

A. B. ORMSBY, Limited
Factories:
Cor. Queen & George Sts. TORONTO
677-81 Notre Dame Ave. W. WINNIPEG

Experts in Fireproof Windows and Doors

"HAGERSVILLE"

CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

Lumber and Interior Finish

	Page
[illegible]	58
Batts Limited	10
[illegible], Ltd.	21
Eaton & Sons, J. R.	21
Georgian Bay Shook Mills	59
Rhodes Curry & Co.	
Sanitary Floor Co.	58
Siemon Bros.	59
[illegible] Co	18
Woodstock Lumber Co.	58

Metal Lath

Galt Art Metal	
Metallic Roofing Co.	49
Noble C. W.	20

Meters

Hopkins & Co., F. H.	60
Neptune Meter Co	17

Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	20
Ontario Asphalt Block Co.	58
Silica Barytic Stone Co. of Ontario	57

Plaster

Albert Mfg. Co.	18
Britnell & Co	18

Pip

Canadian Pipe Co.	54
Dominion Wood Pipe Co.	9
Gartshore-Thomson Pipe Co.	54
Munderloh & Co.	5
Municipal Construction Co	16
National Iron Works	55
Pacific Coast Pipe Co.	1

Power Engines

Inglis Co., John	22

Paints and Varnishes

Cabot, Samuel, Inc.	51
Glidden Varnish Co.	32
International Varnish Co.	19
Paterson Mfg. Co.	

Pile Driving

	Page
Lincoln Construction Co.	16
Lock Joint Pipe Co.	2

Pumps and Pumping Machinery

Beatty & Sons, M.	19
Escher Wyss & Co.	59
Goulds Pump Co.	
Hopkins & Co., F. H.	60
Inglis Co , John	22
Leonard & Sons, E	51
Martin Steam Pump Co.	
McDougall Caledonian Iron Works, John	29
Mussens Limited	30
Ontario Wind Engine & Pump Co.	16
Smart-Turner Machine Co.	1
Waterous Engine Works Co	

Roofing Materials

Barrett Mfg. Co.	
Galt Art Metal Co.	
Metallic Roofing Co.	49
Metal Shingle & Siding Co.	20
Noble, Clarence W	20
Rogers Supply Co.	29
Roofers Supply Co.	57

Railway Supplies

Gartshore, John J.	56
Hopkins & Co., F. H.	60
Mussens Limited	30

Road Machinery

American Road Machinery Co.	11
Case Threshing Machine Co.	11
Climax Road Machine Co.	11
Morrison & Co., T. A	56
Mussens Limited.	30

Sewer Pipe

American Sewer Pipe Co.	13
Britnell & Co	18
Canada Iron Corporation	55
Dominion Sewer Pipe Co.	13
Gartshore-Thomson Pipe Co.	54
Hamilton & Toronto Sewer Pipe Co.	13
Lock Joint Pipe Co.	
National Iron Works	55
Ontario Sewer Pipe Co.	14
Rogers Supply Co.	29
Standard Drain Pipe Co.	13

Sand

Rogers Supply Co.	29

Stone

	Page
Britnell & Co.	18
Brodie, Jas.	
Christie, Henderson & Co.	17
Consolidated Stone Co.	
Contractors' Supply Co.	18
Corinthian Stone Co.	17
Crushed Stone, Limited	51
Doolittle & Wilcox	55
Hagersville Contracting Co.	5
Laurentian Granite Co.	56
Maloney John	53
Morrison & Co., T. A.	56
Myers, Oakley	51
Rogers Supply Co.	29
Roman Stone Co	17
Sackville Freestone Co.	9

Submarine Driver

Roulean, Joseph N.	57

Structural Iron and Steel

Dominion Bridge Co.	52
Hamilton Iron & Steel Co.	
MacKinnon Holmes & Co.	
Pennsylvania Steel Co.	52
Phoenix Bridge & Iron Works	53
Reid & Brown	56
Salter, W. H.	53

Shovels (Steam)

Beatty & Sons, M.	19
Canada Foundry Co.	10
Hopkins & Co., F. H.	60
Mussens Limited	30

Shingle Stains

Cabot, Samuel, nc.	51

Slate

Roofers Supply Co.	55

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	51

Safes and Vaults

	page
Taylor, J & J	

Sheathing Papers

Cabot, Samuel, Inc.	51

Tiles

Smith Marble & Construction Co.	

Tanks and Stand Pipes

Inglis, John	22
Jenckes Machine Co.	2
Leonard & Sons, E.	51
Marsh & Henthorn	49
McDougall Caledonian Iron Works	29
Ontario Wind Engine & Pump Co.	53

Valves

Canada Iron Corporation	55
Gartshore-Thomson Pipe Co.	54
Kerr Engine Co.	
Marsh & Co, Jas.	19
Standard Fitting & Valve Co.	5

Ventilating System

Gardiner & Gaskill	

Waterproofing for Cement and Brickwork

Cabot, Samuel, Inc.	51

Wire Rope

Dominion Wire Rope Co.	60
Greening Wire Co., B.	58
Smith, Thos. & Wm.	8

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	19

Water Wheels

Canadian Boving Co.	

Water Turbines

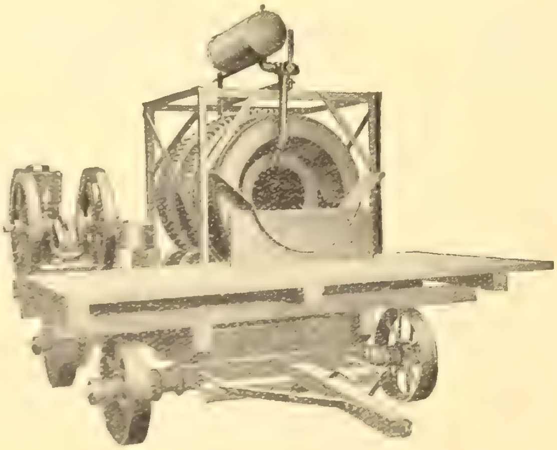
Escher Wyss & Co.	

The Low Charging

CROPP MIXER

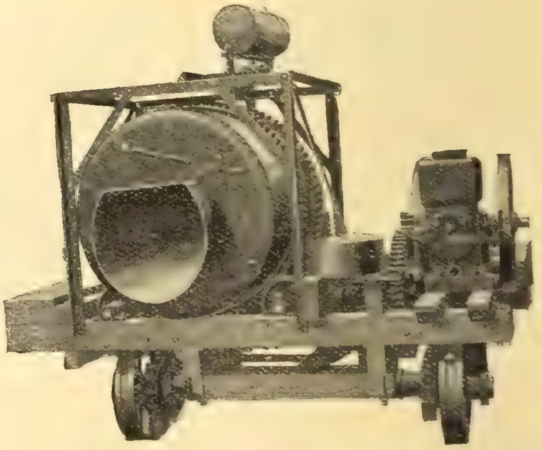
The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.



Either Steam or Gasoline Engine

Our Prices will Interest You.



The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

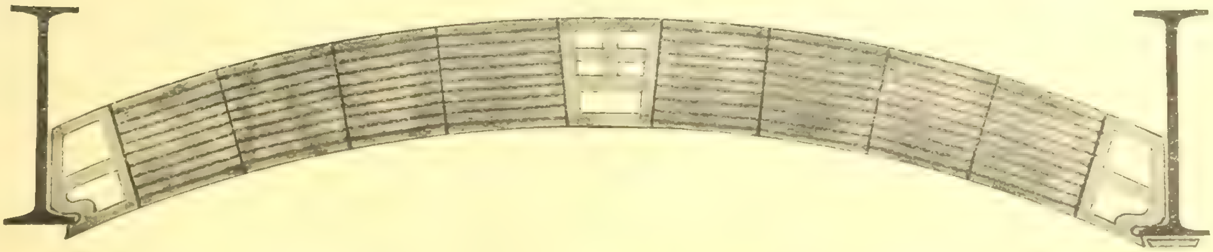
Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering
Arches

Furring
Blocks



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick
Vitrified Brick

Enamelled Brick
Wire-Cut Brick

Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: David McGill, 206 Merchants Bank Chambers

INSIST ON

THOS. & WM. SMITH'S

Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

THE RED THREAD BRAND

Strong Flexible Durable

Thos. & Wm. Smith, Limited

Established for over a Century

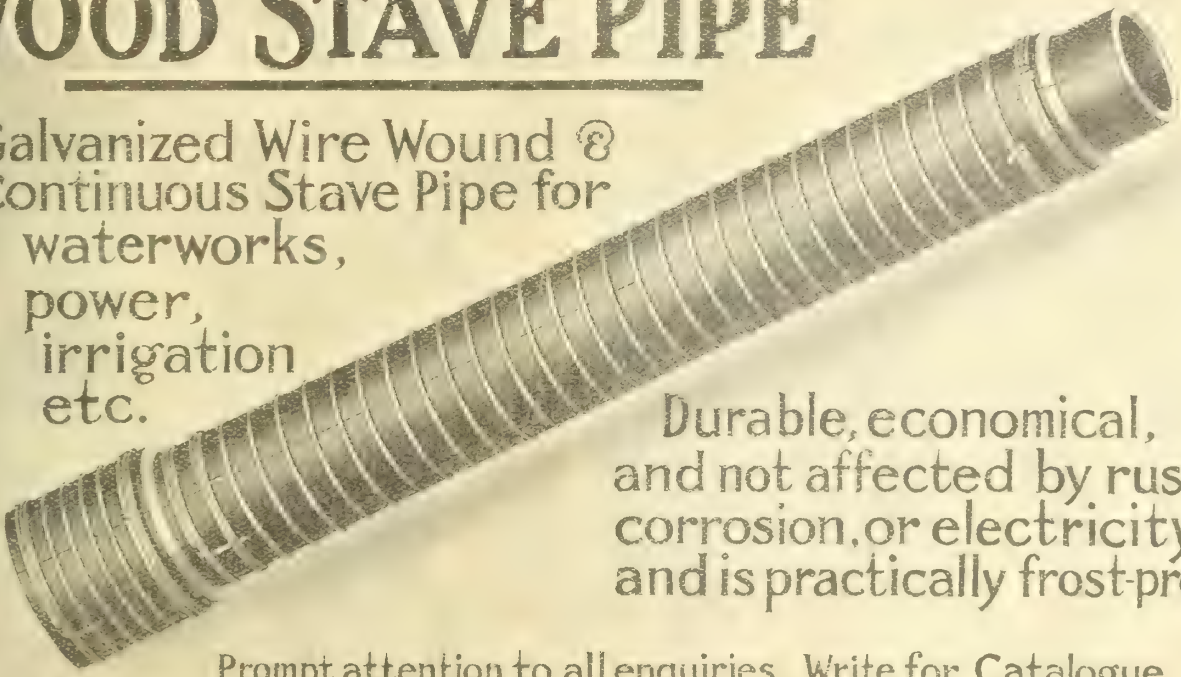
Newcastle-on-Tyne, England

Canadian Representative
D. W. CLARK, Toronto

AGENTS
EVANS, COLEMAN & EVANS, Vancouver, B.C.
ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg, Man.
BAINES & PECKOVER, Toronto, Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

Henry New, President. Robert W. New, Vice-President.

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey Esq., Stewart and Witton, Architects. Hamilton Pressed Brick are used in above.

The high standard of quality and colour, for which this brick is noted, never varies.

This brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company, Limited

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

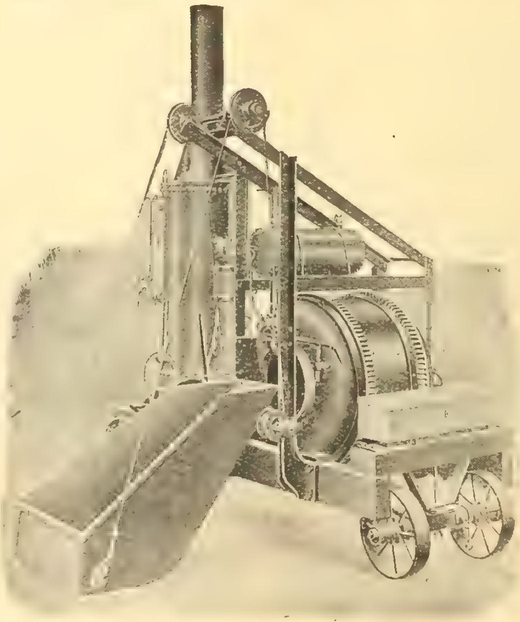
Koehring Concrete Mixers

Steam, Motor or Gasoline Drive

Simple in Operation

Substantial in Construction

Made in sizes to meet all requirements.



Koehring Mixers have proved their superiority by quick action — uniformity of mixture, and reliability under the most exacting conditions.

MANUFACTURED AND SOLD IN CANADA BY

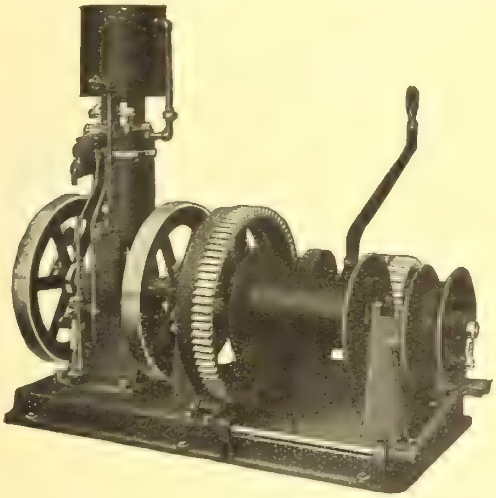
CANADA FOUNDRY COMPANY, Limited

Head Office, TORONTO

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Climax Hoisting Engine

for running two platform Material Elevators

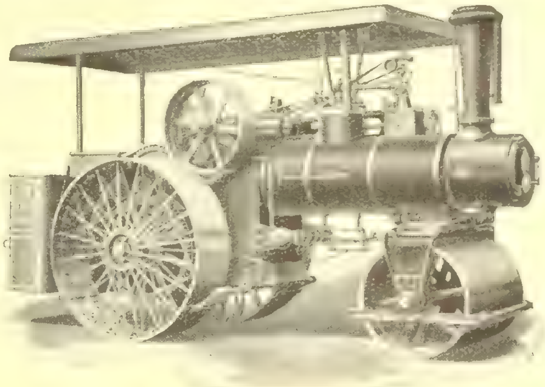


Can be operated by steam, gasoline or electricity

It would be to the advantage of CONTRACTORS and BUILDERS to send for one of our circulars fully describing our CLIMAX HOISTING OUTFIT. Complete outfit can be seen working on the premises

The Climax Road Machine Company
Hamilton, - - Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

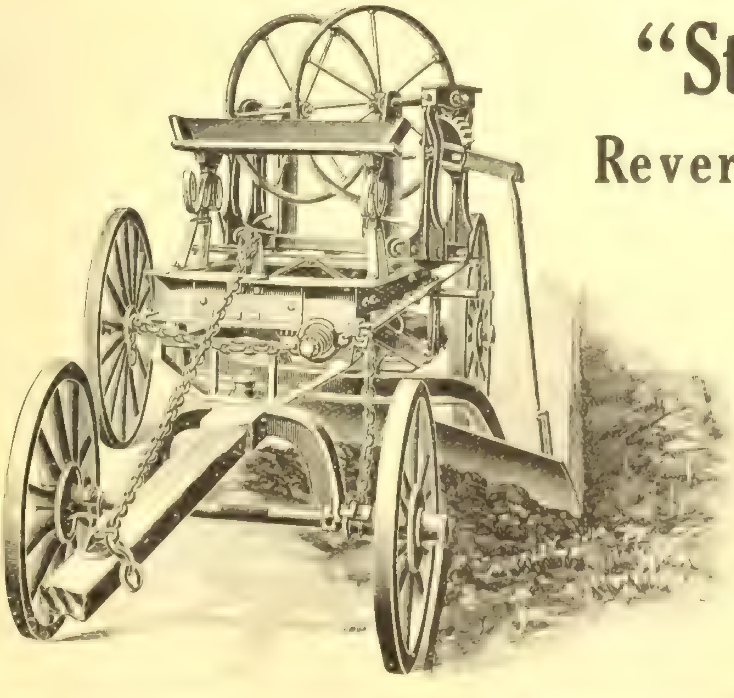
Send for our Contractors General Purpose Engine and Municipal Tractor Catalog 26.

$ $ $ $ $ $ $ $

YOU'LL SAVE MONEY if you do your Road Making with a

"Steel Champion"

Reversible Road Machine



This machine is built to stand, being very substantially constructed of strong material. It does heavy work among roots and stones without any breakdowns which result in loss of time and money.

The many conveniences of this machine are fully described in our catalogue. If you haven't a copy, you should have.

American Road Machine Co.
of Canada, Limited
Goderich, - - Ontario

Designers and builders of road making and contractors' machinery

Chance's
Flemish Glass

A new product of the famous glass works of Chance Bros. & Co., Limited, near Birmingham, England.

"Flemish" is a new and most attractive variety of Ornamental Window Glass, unsurpassed in character and brilliancy. It is particularly effective in the best kinds of Leaded Light work, and for glazing in casements, door panels or interior partitions, where the object is to obscure the vision but not the light.

"Flemish" Glass is made in large and small patterns and in White, Staining White, and numerous Tints.

Chance's Figured Rolled Glass excels in depth and brilliancy of pattern, as well as in easy cutting qualities.

Chance's Double Rolled Cathedral is brighter and more translucent than the ordinary Cathedral, while it costs no more.

To Architects and Contractors we will send on request samples of any of these lines of Chance's Glass.

You will find them distinctly superior.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

J. H. NEW, President. RYLAND H. NEW, Vice-President

A Little Reasoning Will Save You Money

If you will only sit down and reason it out, you simply can't help but agree with us that there must be some good reasons why so many other progressive dealers and consumers prefer

Hamilton Vitrified Salt Glazed SEWER PIPE

Communicate with us and we will reason together

The
Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

Sewer and Culvert Pipes

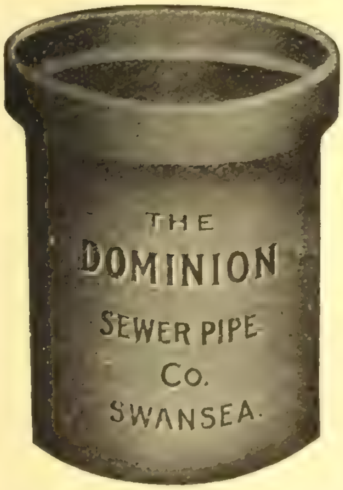
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.
Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection) PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

TRADE MARK

American Sewer Pipe Co.

General Offices: Akron, Ohio, U.S.A.

We can serve you best. Our prices are right. The quality of our goods is of the highest excellence. We are the largest manufacturers of **Vitrified Salt Glazed Sanitary Sewer Pipe** in the world. Sizes, 3 in., 4 in., 5 in., 6 in., 8 in., 9 in., 10 in., 12 in., 15 in., 18 in., 20 in., 22 in., 24 in., 27 in., 30 in., 33 in., 36 in., 42 in. Lengths, 2 to 3 ft. Socket, Standard or Deep and Wide. Thickness in sizes 15 in., to 42 in., both Standard and Double Strength; We also manufacture Flue Lining, Wall Coping, Vitrified Conduit, Vitrified Curb, Paving Blocks, Drain Tile, etc.

Send for Catalogue.

201 Devonshire St., Boston, Mass.

Now That Christmas is Over

PRICES ALWAYS RIGHT

You can think out your

New Year Resolutions

Resolve that as

Mimico Pipe

is the best and costs no more than other makes, **you will use it in 1911.**

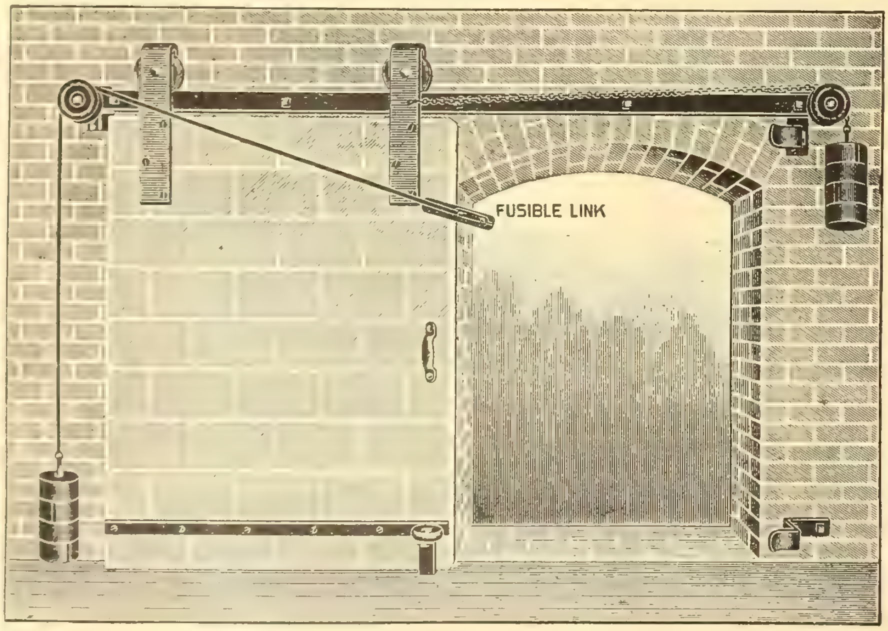
We have resolved to strive for perfection in our ware and **we wont let up on that.** So that when you buy from **Mimico** you will know you are getting **the nearest to perfection it is possible to get** in the present age.

The ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Telephones:—Toronto Connection, Park 422—Evenings, Park 3888 and 3889

Level Slide Fire Door



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

DB **DOUGLAS BROS LIMITED** DB

TORONTO, ONT. MONTREAL, P.Q.

Port Credit Brick

Wire Cuts and Repressed

Wire Cuts and Pressed Brick

Hard Builders for Cellar Work

Second-Class Brick for Inside Work

Dark Faced Red Pressed Brick

Light Face Brick

Special Dark Face Veneer Brick

Our plant has recently been enlarged in such a manner as to enable us to supply these lines to the very best advantage.

We have now one of the finest plants in every particular in America

"Brick," the leading clay journal of the United States, in its January number, says of our plant:

> "When completed the plant will be one of the largest and best arranged plants in America, and anyone who desires to see a modern, well built and well designed plant in operation, a trip to the location would not be amiss."

Prices Furnished on Application.

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street, W., Toronto
Works: Port Credit, Ont.
Office Phone, M. 3167 **Yards Phone, Col. 4853**

Dry Pressed Brick

"Canadian" on every Brick

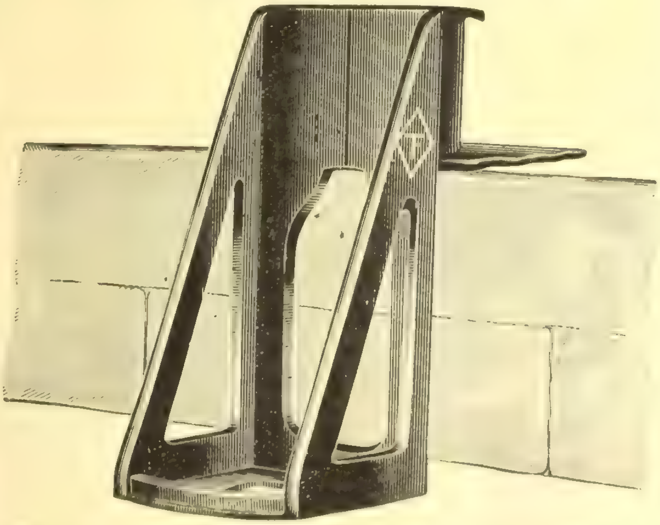
We make a high grade dry Pressed Brick of a rich red Color, they give an unusually elegant appearance to a building, made of the purest shale in the world. Made in and named "Canadian." Popular among Architects and Contractors.

Correspondence Solicited. Let us send you a sample.
Railway shipping facilities of the best.

Canadian Pressed Brick Co. Limited
Phone 423 and 2457
HEAD OFFICE:
Room 36, Federal Life Building, HAMILTON, ONT.

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

Contract Record
Architect & Builder

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, Confederation Life Building, Toronto.

The Municipal Construction Co., Ltd.

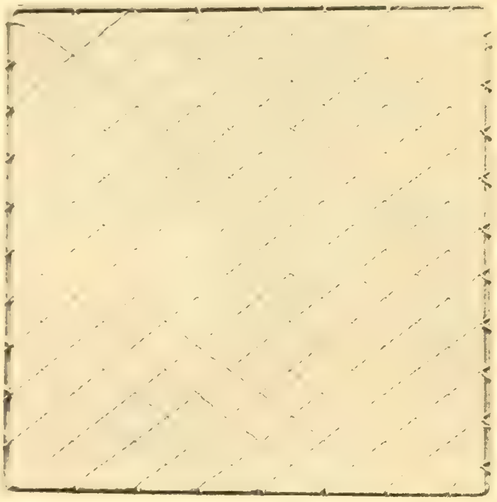
Contractors for

Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe and Continuous Stave Pipe

Agents for Waterworks Supplies - VANCOUVER, B. C.



WIRE WORK

We are pioneers in the manufacture of "Crimped Round Wire Work" and have a separate department for this branch.

Send us your inquiries for

Wire Window Guards and Wire Work of all kinds, in Round or Channel Iron Frames.

BEST WORK — QUICK DELIVERIES

DENNIS WIRE & IRON WORKS CO.
Limited
LONDON - - TORONTO

Veneered Doors

Newel Posts
Staved Columns
Rails and Balusters
Pedestals
Sash
Door and Window Trim
Pine Doors
Interior Finish

Our success is due to the careful working out of, and attention to, details

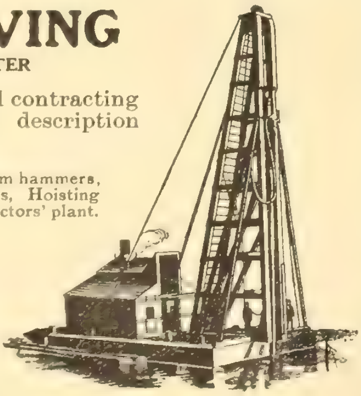
Write for our prices which will be sure to be satisfactory

BATTS LIMITED
50 Pacific Avenue - - West Toronto

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Roman Stone

(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
505 Temple Building
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

CRUSHED

All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

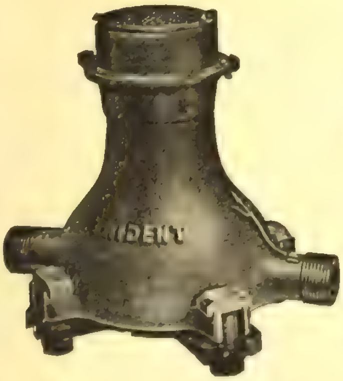
¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Neptune Meter Co.

Manufacturers of the well-known



TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Corinthian Stone

can be supplied in any
size, shape or quantity

Corinthian Stone

can only be procured from, and is manufactured solely by the

Corinthian Stone
Company, Guelph

from the hardest substances available

Write the

Corinthian Stone
Company
G. T. R. Junction, Guelph

Prices are Low   Quality is High

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
TRADE MARK
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

House Trim, Doors, Etc.
in
Chestnut, Pine, Hardwood

Our prices are based upon small profits and always represent full value. Small orders at low prices are invited.

The Tillson Company
Limited
Tillsonburg - Ontario

The
Willson Portable Flare Light

Good contractors know that it always pays to get the best appliances.
The Willison Portable Flare Light, which is specially adapted for use in all kinds of construction work, cannot be beaten in efficiency or cost. Think of it, this light gives a candle power of 8,000 at a cost of less than six cents an hour.

International Marine & Signal Co.
Limited
OTTAWA - CANADA

The Original

MARSH - PAUL AIR VALVE

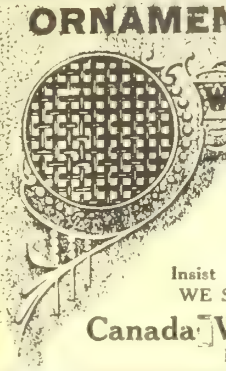
Guaranteed for Five Years

Our Air Valve Catalog describes this Valve and others of our manufacture —also Pressure and Steam Gauges.

Write to-day

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Do not overlook the protection of your windows and security insured by installing our

WINDOW GUARDS

Insist on having HARD STEEL WIRE

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

All International Varnish Products are Sold in full Imperial Measure Cans

That means more satisfaction and better goods for your customers at the same money. Their satisfaction means trade insurance—A permanent clientele for you.

Many prominent architects are kind enough to say that all International Products are hall-marked "Superior Quality."

Be that as it may, when you specify International Products your reputation is protected as far as the ingenuity and experience of any manufacturing concern can protect.

Secure our new album of Superior Finishes and judge for yourself.

Specify the following International Products in the contract:

Elastica **Floor Finish**	**Satinette** "The Enamel that stays white"	**Kleartone** **Stains**	**Flattine** **Finishes**

Full Imperial Measure is used in all Packages

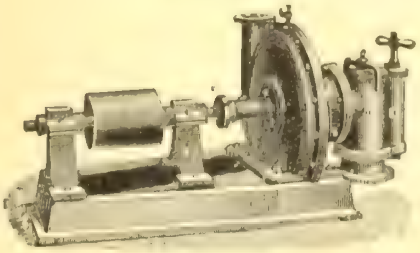
Made by

International Varnish Co., Limited

TORONTO WINNIPEG

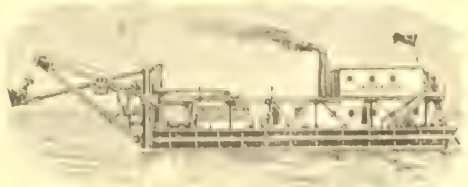
M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

Herringbone Sherardized Lath

is the latest metal lath development. The zinc used in Sherardizing is deposited **within** the steel as well as **upon** it.

Weight for weight the zinc thus used is fifteen times more efficient than the zinc used in hot galvanizing process.

The cost of Sherardizing lath is less than tha cost of even the poorest galvanizing treatment. The result is better than the best galvanizing.

Complete Information Sent On Request

CLARENCE W. NOBLE

GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO, ONT.
The Metal Shingle & Siding Co., Manufacturers

ZINC ORNAMENTS

An extensive range to select from. Special designs made to order on short notice

Every little while we make new additions to our already extensive range of zinc ornaments. This class of work is a specialty with us and we have originated many exceptionally handsome ornaments for use in connection with outside cornices, pilasters, capitals, pediments and other purposes. We have unsurpassed facilities for doing special work on short notice. When figuring on a contract calling for zinc ornaments it will pay you to consult us for suggestions.

Metal Shingle and Siding Co., Limited

Branch Office and Factory, Montreal, P. Q. **PRESTON, ONTARIO**

For

Fire and Furnace Purposes

there are no better bricks than

GLENBOIG or **GARTCOSH**

Brands

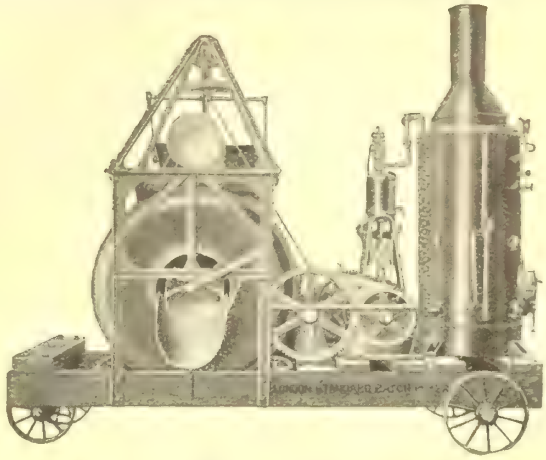
For Building Purposes

where a pleasing appearance is desired, on account of their color, they have been and are largely used

STOCKS carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb, 13 St. John St.
Montreal



London Standard Drum Batch Concrete Mixer

Made in several sizes and with any equipment. This machine embodys the latest improvements in Batch mixers and is second to no other machine. Send for catalog stating capacity required.

We ALSO MANUFACTURE the now famous LONDON AUTOMATIC BATCH MIXERS Nos. 1 and 2, also Face-down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machine, Hand Drain Tile Machine, Sill and Lintel Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A.G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.
We are the Largest Manufacturers of Concrete Machinery in Canada.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write prices

L. A. Delaplante Co.
Limited
Head Office (Manning Arcade)
24 King St. W. Phone Main 591^2 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

"Empire Brand"

ensures a perfectly smooth hardwood floor which will be "a thing of beauty and a joy forever." If you want your clients to speak of you as "a fellow who always uses the best materials obtainable," specify

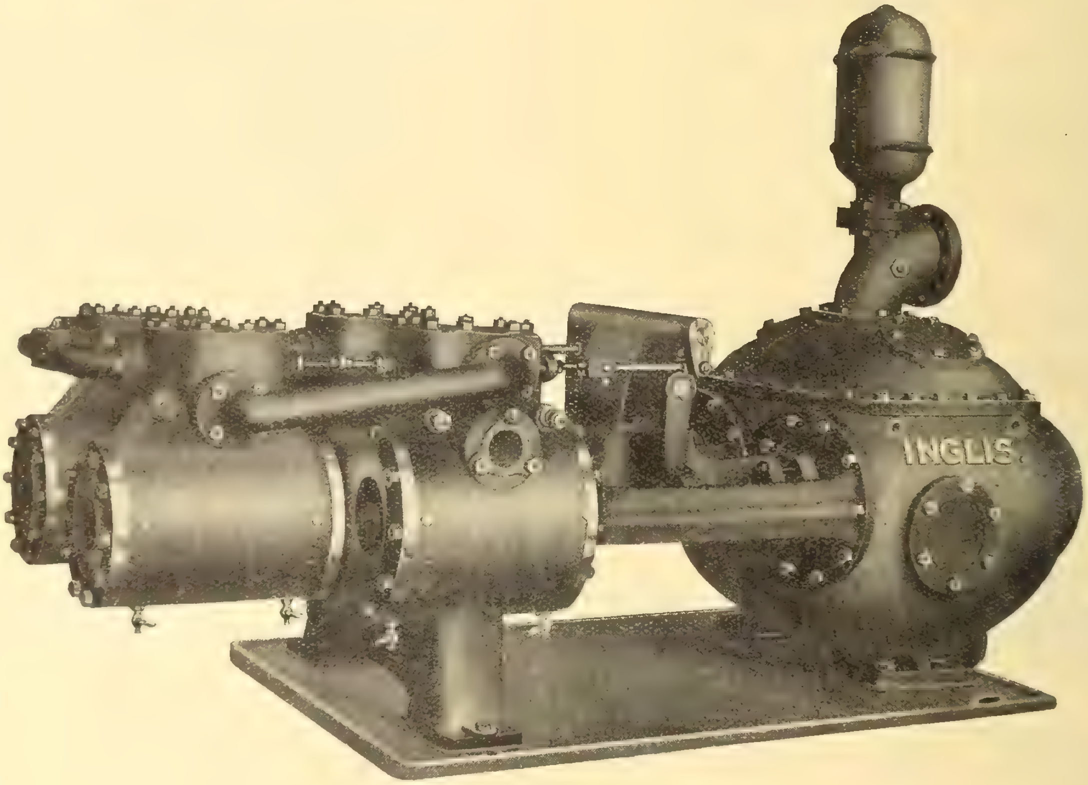
"Empire" Brand

every time.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Montreal Agent
The Hardwood Flooring Co., 55 St. Francois Xavier St.

PUMPING MACHINERY



Compound Duplex Direct Acting Pumping Engine

We build Pumping machinery of all kinds and for all requirements. Experience should be considered when installing a pumping plant. We have built a great many throughout Canada and will gladly refer any corporation who are prospective purchasers to cities, where our pumps are operating and giving entire satisfaction. Built in sizes from one to thirty million gallons per twenty four hours.

Write us for photos and particulars.

The John Inglis Company Limited

ENGINEERS AND BOILERMAKERS

14 Strachan Avenue - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Chilliwack, B.C.

The directors of the Elk Creek Waterworks Company, Limited, of New Westminster, are preparing to expend about $40,000 towards improving and extending the waterworks eystem in the valley. It is the intention of the company to put in another main, ten inches in diameter, from the intake and carry it down from Elk creek to the reservoir on Shannon Mountain.

Gleichen, Alta.

The Galt Engineering Co., Ltd., of Winnipeg, have made the preliminary surveys for the waterworks here. On the approval of ratepayers, contracts will be called, probably in March. Probable cost, $30,000.

Pembroke, Ont.

Tenders will be received by E. A. Dunlop, chairman Water Committee, Pembroke, Ont., to Jan. 9th, for cast iron water pipe. For further particulars see advertisement in the "Tenders and For Sale Department" of this issue.

Tenders will be received by E. A. Dunlop, chairman Water Committee, Pembroke, Ont., to Jan. 9th, for steel piping. For further particulars see advertisement in the "Tenders and For Sale Department" of this issue.

Sydney, N.S.

At the next meeting of council, Ald. MacLennan will move that the city borrow $150,000 for permanent street work.

The city engineer submitted his report on the cost of permanent paving in which the totals were as follows: Hassam paving, total length, $6,750 feet, area 36,187 square yards, total cost $81,420; concrete paving on same areas and length, $61,136.60. Total cost of concrete curb and gutter, $4,310, two of the streets not requiring same.

Stratford, Ont.

City Engineer Ferguson presented the following report on Romeo creek drainage: Concrete culvert, 2,300 cubic yards, at $7, $16,100; Backfilling, $2,000; 10 manholes at $50, $500; 12,972 feet of tile excavation, laying, etc., $7,783.20; 40 catch basins at $12, $480; preparing plans, assessment, etc., $1,000; extras, $1,000; total, $28,863.20.

AWARDED.

Belleville, Ont.

Mather & Platt's turbine pumps will be installed in the pump house here.

North Vancouver, B.C.

The following tenders were received for supply of vitrified pipe: Rob[illegible] & Co., vitrified pipe, $30,694; M. P. Cotton Co., $31,303.55; Wm. Dart & Co., $31,573 (semi-wet piping); McDougall & Co., $32,9[illegible]; W. D. Grant, $37,291. The award was first given to lowest tenderer, but this was disqualified because of it having been delivered two minutes behind the schedule time. The contract was given to M. P. Cotton.

Railroads, Bridges and Wharves

Edmonton, Alta.

The Peace River & Great Western R.R. Co. is reported incorporated to construct a railroad northwesterly and continuing as far as Dawson City. Capital $2,500,000. J. J. Hill, St. Paul, Minn., is reported interested.

Gravenhurst, Ont.

Tenders addressed to R. C. Desrochers, secretary, Public Works Department, will be received until January 16th for construction of wharf here. Plans at offices of the district engineers at London and Toronto and on application to local postmaster.

Kamloops, B.C.

It is reported that the C.N.R. has decided to commence work on one of its proposed 21 tunnels along the route between Yale and this place. T. Turnbull, assistant chief engineer.

Leitche's Creek, N.S.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until January 16th for construction of wharf here. Plans with district engineers at Halifax, Antigonish and on application to local postmaster.

Montreal, Que.

Mr. C. C. Ballantyne, chairman of the Harbor Commission, is authority for the statement that Montreal will have a first-class dry dock with a lifting capacity of 25,000 tons, to be built at Longue Pointe by a British firm and to be finished by next September. Work has already been commenced on the reclamation from the bed of the river of the 30 acres required. Estimated expenditure, $4,000,000.

Ottawa, Ont.

The C. N. R. will construct a bridge over Metcalfe road south of Billings bridge.

The city council have given permission to the C. N. R. to cross Hurdman's road on the level under certain restrictions.

Shigawake, Que.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until January 18th for construction of extension to wharf here. Plans, etc., at offices of district engineers at Quebec, Montreal and on application to local postmaster.

Victoria, B.C.

Tenders addressed to Mackenzie, Mann & Company, Limited, Toronto, Ont., will be received until December 30th for construction of C. N. P. R. from here westerly for twenty miles. Tenders to include grading, fencing, bridging, trestles, culverts and masonry. Plans, etc., at offices of the above at Room 30 Hastings Street, Vancouver, and at the Pemberton Block, this city.

AWARDED.

Brockville, Ont.

Contract for pier here has been awarded to S. Cowan, $6,500.

Black Point, N.S.

The contract for breakwater here was awarded to contractors A. W. Girroir and K. Sweet, of Antigonish, $7,166.

Brocket, Alta.

C. J. Digby has been awarded the contract for erecting the new C.P.R. bridge over Pincher Creek, near here. About 75,000 feet of sawn timber will be used.

Montreal, Que.

The C.P.R. has placed orders for seven million dollars' worth of new equipment, to be delivered next summer. At the Angus shops 2,000 freight cars and 200 passenger coaches will be built. Outside firms have been called on for 2,000 steel frame cars, 500 stock cars, and 800 flat cars. Seventy-five heavy locomotives have also been placed on order.

Paspebiac, Que.

Contract for breakwater has been awarded to Peter Nadeau & Sons, of Grand Cascapedia, $15,719.

Providence Bay, Ont.

Contract for wharf extension has been awarded to Chas. H. Sherwood, of Port Arthur, Ont., $15,438.

St. Joseph de Sorel, Que.

Contract for landing pier has been awarded to Joseph Gardin, of Sorel, $9,100.

St. Croix, Que.

Contract for landing pier has been awarded to contractor O. Poliquin, Portneuf, $22,000.

Westport, N.S.

Contract for pile work wharf here has been awarded to Reid & Archibald, Halifax, $16,670.

Victoria, B.C.

The clearing of the right-of-way of the Cowichan Lake E. & N. extension was awarded to Moore & Pitnck, of this city. That which has just been authorized comprises practically the entire route and instructions have been given to have the task executed as quickly as circumstances permit.

Winnipeg, Man.

Contract for pile protection pier at Winnipeg Beach has been awarded to John [illegible] & Sons, of Winnipeg, $10,[illegible]

Public Buildings, Churches, Schools, etc.

Brockville, Ont.

The council have authorized Mr. Dillon to prepare plans for the repairs necessary to the [illegible]. Tenders will be called shortly.

Brantford, Ont.

Messrs. [illegible] & [illegible], the architects in connection with the proposed extensions and alterations to the general hospital, [illegible] the addition of new ward, $40,000; [illegible] dining room about $10,000; [illegible] ward and alterations in present building, $10,000; central heating plant, $10,000.

Forrester's Falls, Ont.
We have been informed that the tenders received for school house S. S. No. 6 Ross were too high. More money will be raised or the school will be built by a committee appointed to supervise construction. W. S. Colemen, jr., secretary. J. D. McNicol, architect, Renfrew.

Montreal, Que.
The Mac-Vicar Memorial Presbyterian Church have decided on extension.

Tenders addressed to La Societe des Artisans Canadiens Francais, 115 St. Francois Xavier street, will be received until January 9th for construction of a building for above. Plans at offices of Alphonse Venne, architect, 15 St. Lawrence Boulevard, and Dalbe Viau, architect, 76 St. Gabriel street, both architects working jointly.

Mr. Philip J. Turner, architect, the Board of Trade, Montreal, is preparing plans for a new mission building and chapel to be erected at the corner of Colonial avenue and Prince Arthur street for the mutual auxiliary of the London Society for promoting Christianity among the Jews. Work will be commenced next spring.

New Westminster, B.C.
Through the offer of Mr. W. J. Walker, of this city, the districts of Cloverdale and Port Mann and other localities, not decided upon, will be furnished with churches and equipment.

Ottawa, Ont.
In all probability tenders for new departmental building will be called about last of January and work will start early in the spring. The building will be about 600 ft. long and 19 ft. wide, of five storeys, on Mackenzie avenue side, and 6½ on Sussex street. The cut stone will be from Nova Scotia, and the other will be Nepean. There will be a great deal of rock excavation as the rock is practically on the surface. Estimated cost, about $4,000,000. It is expected work will be let by bulk contract.

Port Simpson, B.C.
Tenders are called by public works department, Victoria, until January 20th for erection of new school house here.

Quebec, Que.
Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until January 23rd for restoration of and addition to custom house here. Plans, etc., at office of district engineer, this city, and at local post office; also with H. N. Lymburner, Supt. of Public Buildings, Montreal.

Regina, Sask.
The Baptist Church will erect a handsome new edifice at the corner of Lorne street and Victoria avenue.

Red Deer, Alta.
The Presbyterian synod of Alberta will erect here next year a college for young girls, to cost, including equipment, about $100,000. Rev. N. D. Keith, president.

Sturgeon Creek, Man.
Tenders for school site for Bannatyne S. D., No. 1549, are being called until December 27th. D. A. Macdonald, secretary-treasurer.

St. John, N.B.
W. H. Golding, manager of the Nickel, has announced the intention of his company to erect a first-class theatre with 75 ft. frontage, and depth, nearly 158 feet. Construction, it is stated, will start shortly.

Truro, N.S.
The council have recognized the necessity of a municipal hospital in the near future. A temporary arrangement has been made for a year.

Toronto, Ont.
The Bricklayers' Union have decided to erect a trade hall in the city. Estimated cost, $50,000.

Building permit has been issued for addition to Brown school on Avenue road, $40,000.

Vancouver, B.C.
The head office of the British & Foreign Bible Society has promised $25,000 towards the establishment of suitable Canadian headquarters in this city if the province raises $50,000. A site has been purchased on Howe street, and $4,000 already subscribed. The annual meeting takes place on February 7th. J. Knox Wright, provincial secretary, Canadian Bible Society. Noted previously.

Watrous, Sask.
Work has been started on a union church here.

Wallaceburg, Ont.
The by-law providing for the expenditure of $20,000 for new school buildings has been ratified.

AWARDED.

Dresden, Ont.
Contract for public building has been awarded to W. E. Clark of Wallaceburg, $13,000.

St. Louis du Mile End, Que.
Contract for addition to post office has been awarded to N. Allard & Fils, of Montreal, $4,600.

Victoria, B.C.
The following tenders were received for the construction of the new school on Bank street. Thomas & Hodgson, $19,599 (accepted); Thomas Ash, $19,889; Luney Bros., $20,445; Parfitt Bros., $20,247.20.

Residences

Ottawa, Ont.
Arthur Ryan will probably erect a large apartment house on the corner of Slater and Metcalf streets.

Vancouver, B.C.
Among the permits issued was one to Mr. P. Tardiff for a six-storey apartment house at 1092 Broughton street.

AWARDED.

Nelson, B.C.
John Burns & Son have received the contract for building two houses for F. C. and A. H. Green; also for another house on Carbonate street.

Business Buildings and Industrial Plants

Brantford, Ont.
The Waterous Engine Works have submitted building specifications for an addition to their present factory at a cost of $45,000.

Bradwardine, Man.
The business section, including Ortenburg's general store, F. & J. Fields' hardware, Massey Harris warehouse, Bank of Hamilton and the Beaver Lumber Company's office was destroyed by fire on the 22nd inst. Total loss, about $60,000.

Cranbrook, B.C.
James Finlay proposes erecting a new building on the site of the Prospector office, to cost $2,500.

Guelph, Ont.
The Bowles Syndicate stores branch was damaged on the 20th inst. to the extent of about $11,000.

It is announced that a prominent Calgary syndicate have purchased lots on the north bank of the Fraser river on which it is their intention to erect large grain elevators. The Royal Financial Company, Winch building, effected the sale.

Edmonton, Alta.
The Seton-Smith Company have taken an option of the double southeast corner of Jasper and Fifth.

Guelph, Ont.
The plans for the G. T. R. improvements in Guelph have been received and approved of by the city engineer. They provide for two subways and a foot passageway under the tracks. The main building of the station will be 120 feet in length and 43 feet wide.

Lakefield, Ont.
The Canoe Building & Manufacturing Company's factory was destroyed by fire on the 23rd inst. Loss, about $5,000.

Maisonneuve, Que.
The steel construction work has just been commenced on the new $100,000 building being erected for the United Shoe Machinery Company. The masonry and carpentering contracts are the only ones let in addition to the foundation and steel construction. The architect is Mr. H. C. Stone, 84 St. Francis Xavier street, Montreal; Canadian offices, Dorchester street, W., Montreal.

Montreal, Que.
Messrs. Lande Bros., St. Lawrence Boulevard, Montreal, have purchased two houses on St. Catherine street west, near Bleury street, and intend erecting a modern fireproof building there.

Mr. W. H. Leach, piano dealer, St. Catherine street, has purchased lot 171-9 St. Lawrence Ward, with buildings fronting on Bleury street. Mr. Leach's present intention is to erect a five-storey building on the lot.

The Herald Publishing Company will erect their building on the corner of Craig and St. Alexander streets as early as possible next spring. J. S. Brierley, president. On the former site of the Herald building, it is stated, the owners, Messrs. Brierley and Araham, may erect a modern office building.

Ottawa, Ont.
Mr. Gordon Stewart will erect a three storey commercial building on Queen street of brick with stone front. Work will begin in the spring.

James Mather, architect, is calling for tenders for the carpentering work of the Shim-Shouldis bakery.

The Geo. Matthews Company, Limited, is preparing to build a large addition to the cold stores on Nicholas street. W. E. Noffke is architect.

Regina, Sask.
The excavation for the $100,000 Donahue block on Eleventh Avenue has been fin-

ished, work on the new building will be started early next spring.

Plans have been prepared for a modern four-storey block on Hamilton street, south of Eleventh avenue.

The Bank of Ottawa will erect a handsome office on Scarth street.

Sydney, N.S.
A New York syndicate represented by Messrs. G. H. Browne, Homer C. Wise, a practical iron and steel man, and Henry Henderson, mechanical engineer, are considering the location of a rolling mill here. Two sites have been secured under option.

Tate, Sask.
The general store of W. J. Kenett was destroyed by fire on the 21st inst. Loss about $6,000.

Toronto, Ont.
Permit was issued to the Imperial Life Assurance Company for 8-storey brick and steel building on Victoria street, near King street, $180,000.

Vancouver, B.C.
Excavation has been commenced for the five-storey block to be erected for Capt. W. H. Forrest. Estimated expenditure, $90,000.

The Western Lumber & Shingle Co., of Vancouver, has purchased the lumber mill and limits of the Salmon River Lumber Company which they will operate. A shingle mill and dry kiln may be added. Mr. Mitchell is in charge.

Victoria, B.C.
The Rainy River Gravel Company, Limited, has been incorporated with a capital of $150,000. They have purchased the large gravel deposit at Rainy River on Howe Sound about 25 miles from Vancouver. Plans have been prepared by Mr. C. E. Cartwright, consulting engineer for the immediate erection of a plant to cost about $50,000. The company have opened offices at 701 Bower Building.

Wawanesa, Sask.
The McKenzie block was destroyed by fire on the 18th inst. Estimated loss, $18,000.

Wallaceburg, Ont.
At the municipal elections a by-law will be voted on to exempt from taxation, etc., the Wallaceburg Brass & Iron Manufacturing Company, Limited, in return for which they will erect a plant costing not less than $6,000.

AWARDED.

Ottawa, Ont.
W. C. Edwards Company have been awarded the tender for the finishing work of the Rosenthal Building. C. E. Deakin, general contractor.

Regina, Sask.
Peter Lyall & Sons have the contract for the new banking house of the Canadian Bank of Commerce on Scarth street.

The contractors have commenced work on the new block to be built on Scarth street, south of the Pharmacy, for McIntyre & Fell. It is intended to complete the building by March next.

Power Plants, Electricity and Telephones

Hamilton, Ont.
A Provincial charter has been obtained for an electric railway between Port Dover and this city. Estimated cost, $1,000,000. G. L. Staunton, K.C., solicitor.

Moncton, N.B.
It is expected that tenders for poles and ties for the street railway will be called for this week. Tenders for gas piping and installation have been received.

Montreal, Que.
The Directors of the Saraguay Electric & Water Company have authorized Mr. Charles Brandeis, civil and electrical engineer, 4 Phillips place, Montreal, to proceed with the plans for their new power house, machinery, etc., at an estimated cost of $225,000. Contracts will be placed on or about the 1st of February next. Steam turbines will be installed in units of 3,000 h.p. each. Plans and specifications can be seen at Mr. Brandeis' office at an early date.

Ottawa, Ont.
Tenders addressed to the chairman of the Municipal Electric Department will be received until January 10th, 1911, for supply of switchboard materials. J. E. Brown, elect. supt.

Peterborough, Ont.
Tenders addressed to Canadian General Electric Company, Limited, will be received until January 5th for construction of power house on the waterworks dam near Peterboro. Plans, etc., on application to the above company, 212 King street west, Toronto, or at office of Wm. Kennedy, jr., 8 Y. M. C. A. building, Montreal, Que.

Regina, Sask.
The Street Car Committee will call for tenders for supply of cars. Commissioner MacPherson submitted blue prints for two classes of cars, pay-as-you-enter, and the ordinary car.

Strathcona, Alta.
Electrical Engineer Ewing has advised the installation of a generator almost treble the 250 k.w. limit of the present big unit as a further equipment for the municipal power plant.

AWARDED.

Ottawa, Ont.
The contract for supplying poles and lamps for Sparks street was given by the city council recently to Warnoch, Goddard & Co. Their price was $2,807 for 60 poles and 300 lamps.

Winnipeg, Man.
Acting upon the report of the power engineers, the Board recommends that the contracts be awarded as follows, being the lowest satisfactory tender in each case, namely:—Section "B," Cedar Poles (for Western poles): Northern Electric & Manufacturing Company, Limited, (No. 1), total $16,376. Tenders ranged from this to $23,163. Section "C," Cross Arms: The Northern Electric & Manufacturing Company, Limited (No. 1), total $108.55. Section "D," Hardware Supplies: The Steel Company of Canada, Winnipeg (No. 7), for 8,000 machine bolts for the total sum of $700; the Northern Electric & Manufacturing Company, Limited (No. 1), for the remainder of the supplies under this section for the total sum of $2,128.66. Section "E," Pins and Side Brackets: The Northern Electric & Manufacturing Company, Limited (No. 1), at $195.50. Section "F," Guy Wire: The Steel Company of Canada, Winnipeg (No. 7), all rail $471, lake and rail $457.50.

Miscellaneous

Ottawa, Ont.
Tenders are being called by Public Works Department, for 15-inch suction dredge for Maritime Provinces until Jan. 11, 1911. R. C. Desrochers, secretary.

Tenders addressed to Alexander Johnstone, Deputy Minister of Marine and Fisheries, will be received until February 15th for construction of twin screw steel steamer for survey and inspection work in connection with the St. Lawrence river ship channel to be delivered at Quebec.

Vancouver, B.C.
Vancouver has passed money by-laws amounting in the neighborhood of three million dollars. The city's fiscal agents, Jarvis & Company, of Toronto, say an issue will be made early in 1911.

Recent building permits include:—J. Hendry, 2129 First avenue east, $2,000; J. McDiarmid, 1788 Seventh avenue east, $2,800; Canadian Fishing Company, Inlet waterfront near Gore avenue, $33,000; J. W. Ogden, 1036 Broadway east, $7,500; Quong Chin, 347 Harris street, $20,000; W. H. Walsh, 2043 Whyte street, $2,800; A. Stoeff, 1743 Seventh avenue east, $4,000; C. J. Mayne, 2110 Eighth avenue east, $2,000; J. W. & N. R. Ogden, apartment house, 1096 Broadway east, $7,500.

AWARDED.

Collingwood, Ont.
The contract for a new steel steamer for the lighthouse service on the Pacific coast has been awarded to the Collingwood Shipbuilding Company for $260,000. The vessel will be 200 feet long and modern in every respect.

Summit Lake, B.C.
The Summit Lake Lumber Company has a contract to supply 50,000 poles to Lidsay Bros., Spokane, Wash., the poles to be delivered during 1911.

An Unusual Reservoir for Fire Protection

A very serviceable supply reservoir for fire protection combining cheapness of construction, freedom from depreciation and protected from freezing even in the coldest weather, has been built by the Lowney Chocolate Company at their Mansfield, Mass., factory on design furnished by Mr. F. W. Dean, mill engineer and architect of Boston. A circular hole 4 feet deep and 44 feet in diameter was dug, with a ring 4 feet wide on the circumference going down 2 feet deeper. This ring was then filled with concrete and an 8-inch layer of concrete laid over the entire bottom of the excavation. Concrete walls were then placed, being vertical on the inside with a diameter of 36 feet and battered on the outside to a thickness of 2 feet 6 inches at the top, 15 feet 9 inches above the finished floor. The cover is a concrete dome 42 feet 6 inches inside radius, 15 inches thick at the springing line and 12 inches at the crown. There is a 16-inch by 1-inch steel ring placed 2 feet from the top of the outside wall to take the horizontal thrust of the dome. This ring is 40 feet in diameter and the ends are joined by butt straps with 16-inch by $\frac{1}{2}$-inch cover plates, 2 feet 8 inches long, containing in five rows 50 $\frac{3}{4}$-inch rivets. This ring also serves to strengthen the walls somewhat to resist the hydrostatic pressure. The reservoir has a capacity of [illegible] gallons per inch of depth and a total capacity of [illegible] gallons. It is entirely covered with earth, sloped 2 to 1 on the sides, with a minimum depth of 2 feet at the top.

Narcisse Desjardins, lumber merchant, Montreal, is reported to have assigned.

Tenders and For Sale Department

Tenders for Cement

[illegible] will be received up to DECEMBER [illegible] the supply of Cement during the [illegible] and particulars furnished on ap[illegible]

M. FERGUSON
City Engineer.
Stratford, Ont., Dec. 19 1910. 51-52

To Machinery Users

For 15 years we have handled both new and second-hand Machinery and Contractors' Equipment, and the name, Willis Shaw, is familiar to users of Machinery all over the United States.

We issue a printed list of our offerings with prices, sizes, etc. This we will cheerfully mail on request. We submit it with the assurance that we have investigated, inspected, or have reliable reports on every item in it.

We know how, and do protect the interests of our customers. Confer with us and get prompt service. Large Chicago stock to select [illegible]

WILLIS SHAW MACHINERY CO.,
second-hand Machinery and Contractors' Equip-

Tenders

Sealed tenders are asked (for all and part) for Brick Church, Foldens. Tenders open till JANUARY 14TH, 1911. For plans, etc., see Wm. Pullin (chairman), or C. W. Budd (secretary), Foldens, Ont. Bell phone service 49, ring 14, Ingersoll. Lowest tender not necessarily [illegible]

WM. PULLIN,
52-2 Foldens, Ont.

Wanted

[illegible] American firm manufacturing [illegible] wants to secure Canadian representatives with good connection. Product is now widely used in United States and is an absolutely reliable and economical waterproofer of concrete and cement mortar. For full information write Box 178, CONTRACT RECORD, Toronto. 52-1

Railway Construction

Tenders will be received up to noon JANUARY 2ND, 1911, for the construction of the Roadbed and Structures of the following sections of the Manitoulin and North Shore Railway:—

Crean Hill, mile 22.7 west of Sudbury, to connection with present line at Espanola.

Espanola, south to a point at or near Mile 61.

Plans, profiles and specifications may be seen at the office of the chief engineer, Sault Ste. Marie, Ontario, at the offices of the "Canadian Engineer" at Montreal, Toronto or Winnipeg, and at the office of the "Railway & Marine World," Toronto.

All tenders addressed to R. S. McCormick, Chief Engineer Manitoulin and North Shore Railway, Sault Ste. Marie, Ontario.

The lowest or any tender not necessarily accepted. 51-52

The City of Regina

Street Railway Materials

Sealed tenders marked "Tenders for Street Railway Materials," will be received by the City Commissioners, Regina, until 12 o'clock noon, JANUARY THE TENTH PROXIMO for the supply of Rails, Track Specials, and Overhead Material.

Full particulars may be had upon application to the City Engineer.

A marked cheque covering 5 per cent. of the amount of the bid must accompany each tender.

The lowest or any tender not necessarily accepted.

(Signed) L. A. THORNTON,
City Engineer.
Regina, Sask., Dec. 17, 1910. 52-52

City of Vancouver

Tenders for

Road Roller

Tenders will be received by the undersigned up to TUESDAY, FEBRUARY 7TH, 1911, at 2 p.m., for the supply of a new Road Roller, weighing not less than fifteen tons, for the City of Vancouver, B.C.

Tenderers are required to submit specifications with their proposals.

A deposit of an amount equal to 5 per cent. of the contract price must be made with each tender, by marked cheque payable to the City Treasurer.

The lowest or any tender not necessarily accepted.

WM. McQUEEN,
City Clerk.
City Hall, Vancouver, B.C.,
December 20th, 1910. 52-2

The Town of Pembroke, Ontario

Tenders for

Cast Iron Water Main

Tenders are required by the 9TH JANUARY for the delivery of Cast Iron Water Main.

Prices to include for 16-inch diameter cast iron hub and spigot joints. Approximate length 5,900 feet. At least in 12-feet lengths, exclusive of socket. Pipes to be in accordance with the Canadian Society of Civil Engineers standard specifications for cast iron pipe and special castings. Class D. Tenders to specify price per foot and include delivery f.o.b. cars Pembroke.

Tenders to be sent in to Mr. E. A. Dunlop (Chairman of Water Committee, Pembroke).

The right is reserved to reject any or all tenders. Any tender will only be accepted on condition of entrance into a bond as to specification of quality and time limit for delivery.

Tenders to specify earliest possible delivery with limit period for completion of delivery.

By Order,
A. E. FORTIER,
Town Clerk, Pembroke.
T. AIRD MURRAY,
Consulting Engineer, Toronto. 52-52

City of Regina

Tenders for Power Plant

Tenders are asked for by the City of Regina for the supply and installation of any or all of the following, together with the necessary connections ready for operation:

1 1500 k.w. Steam Turbine Generating Unit.
1 500 k.w. D.C. Generating Unit.
2 500 Horse Power Boilers.
1 Economizer.
1 Hand Power Travelling Crane.
1 Coal and Ash Conveyer.

Tenders will be received for the above until 10 p.m., TUESDAY, JANUARY 17, 1911. Specifications and all information will be furnished on application to the undersigned or to E. W. Bull, City Electrician.

(Signed) A. J. McPHERSON,
51-2 City Commissioner.

The Town of Pembroke, Ontario

Tenders Required for

Steel Tubes for Intake Pipe

Tenders are required by the 9TH JANUARY for either rivetted or lapwelded Steel Piping.

Prices to include for 18 inch diameter steel piping ¼ inch thick—approximate length 6,000 feet—cast Steel Flanges—Wood or other approved Gaskets—Approximate number fifteen Flexible Joints, Cast Iron Double Flanged Ball and Socket Joints.

Prices to include delivery f.o.b. cars Pembroke.

Tenders to specify price per foot for piping, including flanges, bolts and gaskets complete. For Flexible Joints, price per joint is to be specified. Tenders to specify earliest possible delivery with limit period for completion up to end of February, 1911.

Tenders to be sent in to Mr. E. A. Dunlop (Chairman of Water Committee, Pembroke).

The right is reserved to reject any or all tenders. Any tender will only be accepted on condition of entrance into a bond as to specification of quality and time limit for delivery.

By order,
T. AIRD MURRAY, A. E. FORTIER,
Consulting Engineer, Town Clerk,
Toronto. Pembroke.
52-52

Miscellaneous

Advertisments under this heading one cent a word per insertion. Box No. ten cents extra

A reliable and well established firm wish to represent for Manitoba a manufacturer of Canadian Concrete Mixers of reliability and moderate cost. Address Box 176 Contract Record, Toronto, Ont. 51-52

J. Napoleon Gignac, sash and door factory, Quebec P.Q., is stated to have assigned.

Robert & Frere, plumbers, Montreal, are reported to have assigned.

New Companies

The South Shore Gas Company, Limited, Montreal, Que., incorporated, capital, $100,000. Incorporators: A. Huntly Duff, advocate; R. T. Heneker, K.C., and Hugh Wylie, all of Montreal.

McDonald & Wilson Company, Limited, Montreal, Que., capital, $25,000. Incorporated to manufacture and deal in heating, gas and electric fixtures, etc. Incorporators: C. S. McDonald, merchant; H. and May W. Wilson, and F. J. Parsons, merchant, all of Toronto.

The Producers Natural Gas Company, Limited, Hamilton, Ont., incorporated, capital, $200,000. Incorporators: W. Southam, publisher; J. Milne, manufacturer, and G. Lynch-Staunton, K.C., and A. W. Penne, architect, all of Hamilton, Ont.

The Tekton Manufacturing Company, Limited, Niagara Falls, Ont., capital $40,000, incorporated to manufacture and sell lumber and building material, etc. Incorporators: H. D. Ruhm, Buffalo, N.Y.; F. O. Geyler, manufacturer, and E. M. Sergeant, chemical engineer, Niagara Falls, N.Y., and J. M. A. Stillesen, chemist, Niagara Falls, Ont.

The Maximilian Pneumatic Tool and Machine Company, Limited, Woodstock, Ont., incorporated, capital, $100,000. Incorporators: D. W. Karn, manufacturer; R. T. Parke, physician, both of Woodstock, Ont.

Canadian Carbonate Company, Limited, Montreal, Que., incorporated, capital, $100,000. Incorporators: W. I. Powers, manufacturer; C. L. Stuart, town clerk, both of Lyndonville, Vermont, U.S.A.; J. R. Colby, Montreal West, and D. Burley Smith, both of Montreal.

National Hydro-Electric Company, Limited, Montreal, Que., capital, $1,000,000, incorporated. Incorporators: A. Surveyer and Royal LeSage, civil engineers, both of Montreal, Que.

Canadian Electric Automatic Machines, Limited, Ottawa, Ont., incorporated, capital, $225,000. Incorporators: L. S. Macoun, manufacturers' agent; J. B. Prendergast, banker, both of Ottawa.

The Lightning Furnace Company, Limited, Montreal, Que., incorporated, capital, $90,000. Incorporators: R. Houle, real estate dealer; E. Roy, plumber, both of Montreal, Que.

Automatic Electric Cook Co., Ltd., Toronto, Ont. Capital, $100,000. Incorporators, Wylie Hart, barrister, and Chas. H. C. Leggott, accountant, both of Toronto.

The Central Canada Power Co., Limited, Toronto; incorporated; capital, $10,000,000. Incorporators: Strachan Johnston, R. H. Parmenter, solicitors, Toronto.

Operating Blast Hole Drills with Common Laborers

The writer has visited many [illegible] contracts and quarries throughout the United States in the interest of drilling equipment for blast holes and has talked with a great many superintendents regarding the production of stone, and it is surprising the number of concerns who have not been able to solve the problem of drilling and blasting; which is due entirely to their lax method of handling that end of the business.

The big majority of men in charge of this class of work seem to consider that the drilling and blasting of material is of minor importance, and place in charge of the work men who are totally ignorant of the proper drilling and spacing of holes or the proper handling of explosives, and the also equally important item of operating the drills successfully in order to get the maximum number of feet per day.

The steam shovel is manned by a competent engineer and craneman; the locomotive by a skilled engineer; in fact, everything necessary for the handling of material is in charge of experienced men. But when it comes to the production end, this is too often dependent upon the cheapest labor obtainable.

If there is no material to be handled, the entire outfit is at a standstill; if the material is not properly broken up, the entire efficiency of the outfit is curtailed.

The men in charge of drilling and blasting hold the key to the production of the plant; they vary the profits to such a degree that this, being the most important factor in connection with the plant, it should be under the care of competent men to not only operate the drills successfully, but to be able to space the holes and use the right amount of explosive to do the work properly without waste of material.

The saving of drilling by proper spacing and springing of holes, the material broken up properly for economical handling, the delays of the entire shovel crew incident to the improper production of material, have no comparison to the trifling saving as between a cheap man and a competent man in charge of the drills.

Contractors who have tried out the experiment of placing drill men in charge of their outfits find that it is the most economical by big odds; the writer refers to drills of the well-driller type.

When they are being used for deep holes and light charges, it is no small problem to handle the drilling and blasting end of a big contract, as there are no set rules that can be strictly adhered to, on account of the varying conditions of materials to be handled.

A plan carried out successfully on one job does not mean that it can be done in exactly the same manner on the next job, even if the material seems to be about the same, so that each proposition must be worked out according to its own peculiarities.

A man who can adapt himself to the varying conditions can save the contractor more money than any other man on the job, and a cheap drill foreman can break up more machinery, cause more delays, and, through inexperience, waste more explosives, therefore causing more loss, than any one else on the job.

Strengthening Railway Tracks for High Speed Traffic

At the [illegible] International Railway Congress four lengthy papers were presented on the subject of "Strengthening Railway Track for High Speed Traffic." It is interesting to note that there was a general agreement that in Europe no improvements over existing methods of track construction were thought necessary or desirable. In Germany the [illegible] of strengthening tracks was said to be due to increase of heavy freight traffic, rather than to high speed passenger traffic, although in that country the limit of axle [illegible]

In England the [illegible] track construction is thought amply strong, provided it is maintained in [illegible] condition. Mr. Jacomb Hood stated that the perfection of design in track might be neutralized by neglect to maintain such track in the best possible condition to meet the exacting requirements of heavy loads and high speed service; and Mr. Rosche pointed out that the stiffer the original track the less the cost of maintenance might be.

The paper by Mr. Herman Rosche, of Austria, was an important treatise on track design. When strengthening is necessary he recommended a general revision of the entire roadbed in order to keep all its parts in proper relation as to strength and resistance. The ballast should be made deeper and of better quality. He recommends a minimum depth of 18 inches of hard stone. He also advocates extreme length and width of ties (8 feet ten inches by 10¼ inches), but puts less emphasis upon thickness. Steel ties of recent design [illegible] than wooden ties, and their use is chiefly an economic consideration. Improvement in the quality of the steel rail is considered of more importance than the weight. Close[illegible] splices are advocated, and special emphasis is laid on [illegible] joint ties.

The American contribution to the subject was from M. L. Byers, of the Missouri Pacific Railway, who said that one way of strengthening is by increasing the sustaining power of the sub-grade, which is in general too costly. The other way is to reduce the pressure upon the subgrade by using rails of heavier weight or higher grade steel, by spacing the ties more closely and by giving a greater depth of ballast or by a combination of these means.

The Engineering News, considering the whole subject editorially, says that while American railways have a very large mileage of high class track construction, high speed service is by no means confined to such track, and suggests that foreign practice indicates a track structure that is in some respects more substantial and perhaps more economical than much of the track carrying high speed trains in this country. What is needed here is the more extended use of the present type of high-class track construction over a greater mileage, with ample attention to the maintenance of such track in condition suitable for the loads and speeds which it carries.

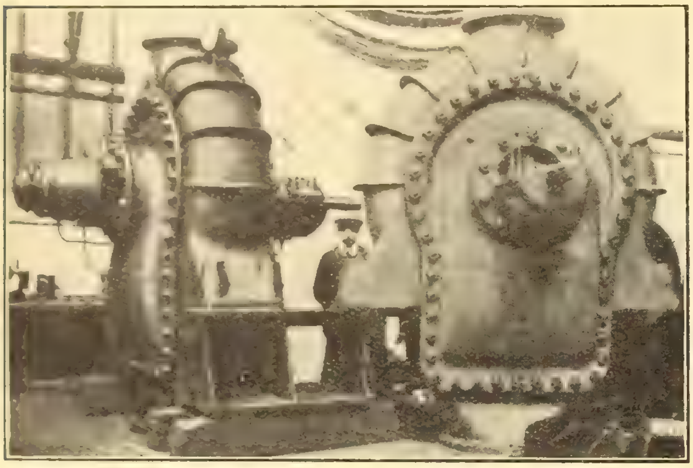
Depositing concrete for street foundations by mechanical means has been adopted in a number of cases and by different types of apparatus. With a portable concrete mixer the concrete may be delivered upon a belt conveyor, a gravity chute (of very slight inclination), or a dump bucket travelling to and fro upon a horizontal boom. The boom, chute or conveyor is attached to the mixer and is pivoted so as to distribute concrete within a wide sweep. The conveyor and chute can deliver the concrete only at the ends, and the latter will require a man to keep the concrete moving with a spade or hoe. The bucket, however, can be dumped at any point between the mixer and the end of the boom. With appliances of this kind there is a considerable reduction of labor as compared with the distribution of concrete by shovelling.

Allard & Company, [illegible] Montreal, [illegible] have dissolved.

[illegible]

Turbine Pumps for Toronto Water Supply

The accompanying cut shows two of the turbine pumps being supplied to the city of Toronto by the Canadian Boving Company, Ltd. The total number of pumps to be at present installed includes four pumps for the main pumping station, two fire pumps and also two domestic pumps for the high level station on Cottingham street. The four pumps in the main station will be capable of delivering, each, 13 1-2 million gallons per day, against 250 foot head, running at 750 revolutions, normal power 890 h.p., overload 1,500 h.p. The two fire pumps are to deliver each 10 million gallons per day against 110 pounds pressure, at 720 revolutions. The two high level domestic pumps will deliver each 10 million gallons per day against a 65-pound pressure, at 750 revolutions. The pumps, on test, showed an efficiency of 84 per cent.



Turbine Pumps for Toronto—Jens Orten-Boving type

The pumps are of the high pressure multi-stage type, fitted with impellers and guide wheels of a special bronze, the position of which has been determined by protracted tests and experience in the manufacture of pumps and water turbines. The inner surfaces of the impellers and guide wheel channels are carefully finished throughout, so that the water during its whole passage through the pump, from the first impeller to the delivery casing, never comes in contact with any rough surface. This is an important point, as experience has proved that wheels treated thus have a much longer life when dealing with gritty or muddy water. In addition it is clear that the consequent decrease in friction materially improves the efficiency. The casing is of cylindrical bore. Dismantling and re-assembly of the wheels and diaphragms which fit cylindrically into the casing is an easy matter, as they have only to be pushed in one after the other from the open end. All these parts are interchangeable, the pumps being made to limit gauges throughout. The shaft is made of high grade nickel steel to secure strength and rigidity as well as to resist corrosion. Where it passes through the stuffing boxes, it is covered by renewable bronze bushes, and thus protected from undue wear due to packing material or gritty water. The bearings are of the ring lubricating type, specially designed for high speed and separated by a gap of 2 inches from the packing so that it is impossible for any grit, mud or water to enter.

The Resilience of Reinforced Concrete

A recent issue of the *Cornell Civil Engineer* describes a very interesting set of experiments made by E. J. McCaustland, to determine the relative amount of permanent deformation or set in concrete beams with different types of reinforcement bars and loaded up to about the safe working stresses. Only 24 beams were tested, and, since the results are not sufficiently concordant, the experimenter does not believe that they warrant general conclusions, but merely suggest the need for further tests.

Twenty of the beams measured 6 x 8 in. in section and were tested on a span of 6 ft. They were made in proportions of 1:3:8 with 1-in. limestone, run of crusher. The beams were tested at the age of 30 days, and the reinforcement was placed 6½ in. below the top of the beams. Six-in. cubes of the concrete mixture were tested for compression at 30 days and gave an ultimate stress of 980 lb. per sq. in.

The remaining four beams were 8 x 11 in. in section and were tested on a span of 12 ft. The concrete was mixed in proportion 1:2:4 with 1¼-in. limestone. They were tested at the age of 60 days, and the reinforcement was placed 10 in. from the top of the beams. The average crushing strength of the mixture at 60 days, determined by tests on 14 6-in. cubes, was 1.670 lb. per sq. in.

The tests seemed to indicate that the permanent deformation was considerably larger with the deformed than with the plain rods and bars. The deflection and permanent deformation curves of the beams containing plain reinforcement seemed to partake of the same general character as like curves for a plain concrete beam, which was also tested. Two of the beams made with the leaner concrete failed by the slipping of the bars, and the curves of these two bore a greater similarity to the curves for the deformed bars than to those of the other plain rods and bars. Mr. McCaustland is of the opinion that the curves indicate that a smooth rod or bar does not act to modify in any marked degree the resilience of the beam as a whole. In the beams where the rods slipped the concrete was unusually lean, and the resilience of the concrete itself did not seem to be sufficient to overcome the friction of the rods and force the beam to resume its original form.

In the beams reinforced with deformed bars the deflections usually were large and the recovery after the removal of the loads quite small, seeming to indicate that while certain types of deformed bar allowed greater deflection they also acted to prevent the recovery of the specimens when the load was removed. Though this was the general rule, some beams with deformed bars showed a recovery almost equal to those with plain rods and bars. The tests are not believed by Mr. McCaustland to be sufficiently thorough to determine in what manner the relative stiffness of beams of approximately equal strength is affected by the type of reinforcement, or to determine what effect the latter has on the ability of the beams to absorb loads and shocks without permanent injury.

The Passing of the Indentured Apprentice

At the December meeting of the Builders and Contractors' Association of Essex, held at Windsor, Ont., recently, the following resolution was passed:

Be it resolved that this Association views with no small measure of alarm the passing of the indentured apprentice. It is our opinion tat unless something is done by which their places may be filled by others equally skilled in the building trade, the time is not far distant when the lack of skilled mechanics will militate seriously against the proper and prompt construction of all residential and industrial buildings.

We recognize the necessity of prompt action, as those who now are classed as skilled mechanics are fast disappearing, with little prospect of any one capable to take their places. It is our opinion after mature consideration that we must practically depend upon the sons of the working man for our future skilled mechanics, therefore it becomes necessary to place an opportunity in their way, and in view of such we would make the following suggestion:

That technical training be added to the public school curriculum, so that our sons may have the advantage of being trained in the theories connected with the different branches of the building trade, that later on they may be able to apply this knowledge in a practical way. This, we believe, would eventually bring about desired the results.

Contractors and Builders Supplies

Crushed Stone

For Concrete Fireproof Construction, Roadwork and Sidewalks

Rubble, Portland Cement

CRUSHED GRANITE for Floors and Sidewalks
SEWER PIPE WEEPING TILE
FIRE BRICK FIRE CLAY

Crescent Fire Brick

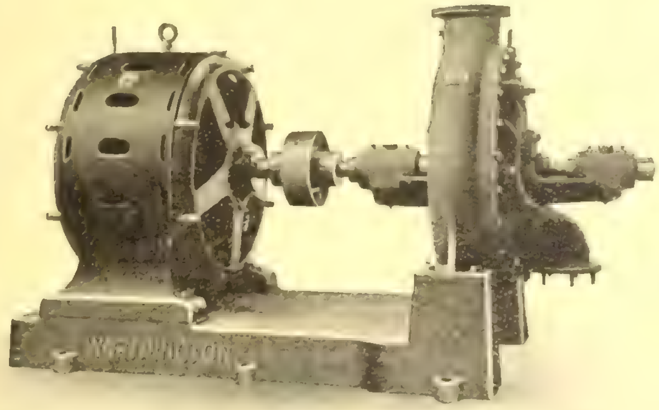
We are exclusive Distributing Agents for this high grade, hand-made fire brick. Large stock always on hand.

Don't forget our Prompt Delivery Service.

The Rogers Supply Co. - Toronto

Head Office: 28 King Street West Phone Main 4155

WORTHINGTON TURBINE PUMPS



Admirably suited for electric drive

EFFICIENCY TELLS

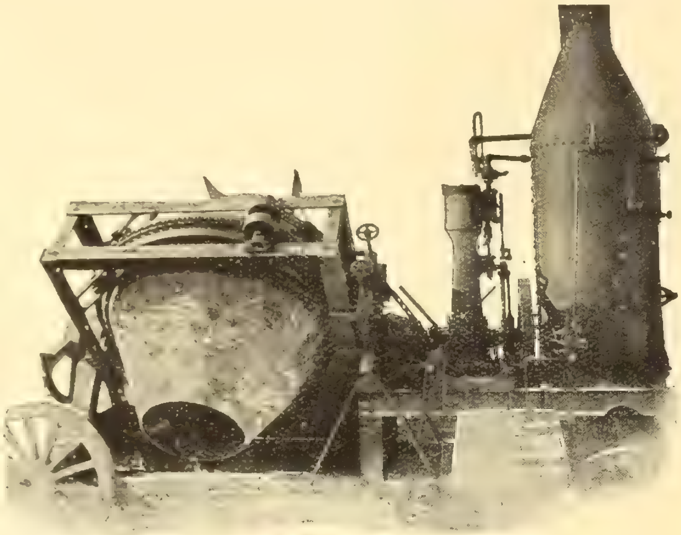
WE HAVE THESE PUMPS IN SUCCESSFUL OPERATION IN WATERWORKS, MINES, PULP MILLS, PAPER MILLS, DREDGING, EXCAVATING, CIRCULATING CONDENSER, WATER AND BRINE IN REFRIGERATING PLANTS, AND FOR FIRE, BOILER FEED AND GENERAL PURPOSES.

SEND FOR DESCRIPTIVE LITERATURE

WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited



Here is the first Smith Mixer. It was built in 1900 and is still working steadily and turning out high class concrete. It is one of an army of over 4,000, which are without exception giving satisfaction. Not one failure out of 4,000 machines is an unequalled record.

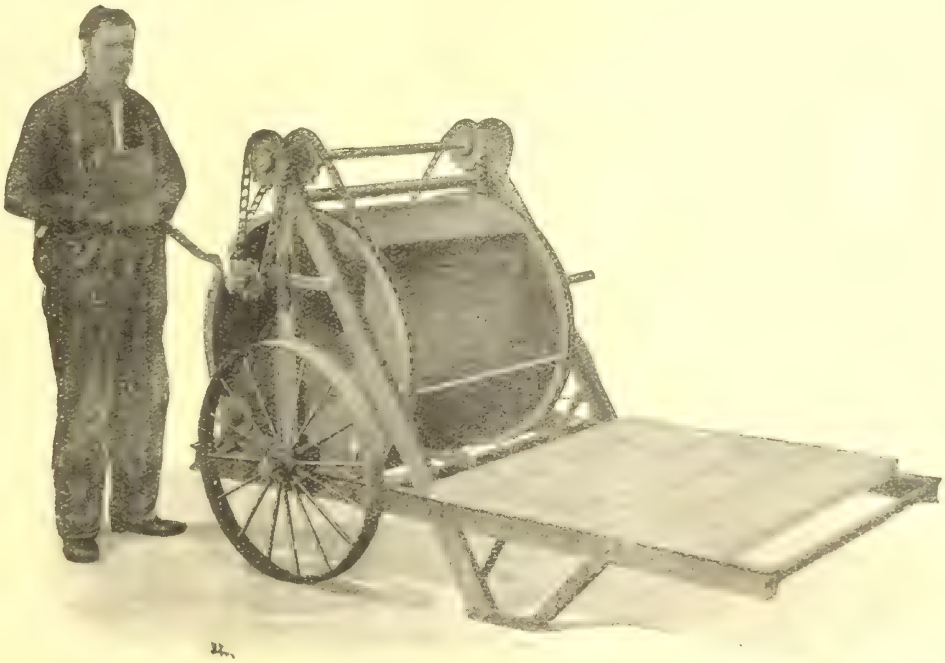
This illustrat
Mixer, moun
and Boiler.
cause it is fou
portant concr

**Ask any user
Smith. Ask t
why they sp
reasons.**

The Smith Mixer

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine

MUSSEN



ndard Smith
with Engine
r to you be-
najority of im-
s in Canada.

**inks about the
and Engineers
ith—There are**

This is one of the latest Smith products—a hand-mixer that meets a certain demand for small concrete jobs. We can't tell you how it operates here, but will be glad to send you full particulars.

Our Concrete Mixing Equipment also includes:
Chicago Concrete Mixers, Concrete Hoists, Concrete Buckets and Skips, Concrete Barrows, Carts and Cars, Etc., Etc.

**s Better, Mixes Faster, Mixes Cheaper and
the Work Better than any Other Mixer Made**

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Crown Block.
Vancouver, Mercantile Bldg.

Glidden Concrete Finishes

Transparent Waterproofing

This material is intended for use upon concrete construction in general, with the view of waterproofing the structure and at the same time not staining or affecting the color or texture of the surface

One Coat Only

is required to produce excellent results along damp-proofing lines.

Also Incorporated in the Mass Structure

in which event it permeates every molecule of the concrete aggregate, completely waterproofing same throughout the entire mass. This product forms an emulsion with the alkali of cement, which is carried uniformly through the structure, producing a homogeneous waterproof result.

Glidden Finishes For Every Use

Write for Complete List and Specifications—Stating Requirements

The Glidden Varnish Co.

Branches and Warehouses
Atlanta Boston Chicago New York St. Louis

FACTORIES
Cleveland Toronto

Write for Booklet:—"Advanced Finishes for Modern Building Construction."

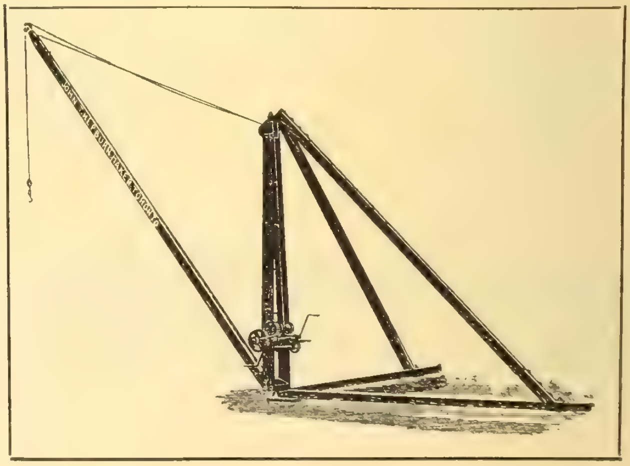
Wire Rope any size for all purposes

Every "Hepburn" Derrick, when it leaves our works, is equipped with an ample length of first quality wire rope.

But one Derrick will outlive many a rope. Our Wire Rope is

Strong, Flexible
and
Thoroughly Tested

When your old rope is worn, when you need wire rope of any size, in any quantity or for any purpose, you cannot do better than send direct to us for it.



Let us send you Quotations

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY

HUGH C. MACLEAN, LIMITED

HUGH C. MacLEAN, Winnipeg, President
THOMAS S. YOUNG, General Manager.

HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trade
CHAS. C. MASON, Representative

WINNIPEG - Telephone 224 - 404 Travellers' Bldg
D. W. B. SPRY, Representative

VANCOUVER - Tel. 2010 - 26 Crowe & Wilson Chambers
J. V. McNAULTY, Representative

CHICAGO - - - - - - 4059 Perry Street
E. J. MACINTYRE, Representative

LONDON, ENG. - - - - - 3 Regent St., S.W.
W. A. MOUNTSTEPHEN, Representative

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 December 28, 1910 No. 52

Local Preference

Not an infrequent source of trouble in municipal circles is the awarding of contracts for local work to local concerns. The matter has been discussed in these columns before but it is continually cropping up. Those who favor local companies often do not possess a very clear idea as to why it should be done. It seems to us that there are a number of arguments against local preference.

The advocates of the "local contracts for local men" principle urge that the extra money, being spent locally, all comes back again, and is, therefore, not really a loss. Of course, it is not a loss—except indirectly—to those employed on the contract, but it to those who pay for the contract, and it does not require a Solomon to realize that people who habitually pay 10 per cent. more for their goods than is necessary are virtually reducing their income by 10 per cent.

There is no justification for paying a local firm a high price because it is too ignorant to realize that it could do the work for less. To do so would be simply to subsidize the employers and shareholders at the expense of the purchasers. Nor is there any reason for not accepting a low tender because, from stupidity or ignorance, a non-local firm has offered to do the work at a figure which may mean a profit of only 3 or 4 instead of 10 to 15 per cent. One of the causes operating to determine price is the cost of material. Here, obviously, it is senseless to subsidize a firm which buys its material wastefully or without due consideration for market changes, or which has placed its works so that carriage on material is excessive.

Another condition affecting the price is the equipment—we mean not only the buildings, cranes, tools, and machinery, but also the men, the designers, and the management. If one firm by its enterprise and judgment can produce more cheaply than another, then, surely, that is a legitimate reason for encouraging that firm and saving the pockets of the purchasers.

A Lesson in Punctuality

The value of punctuality in the contracting business was emphasized rather forcibly at Vancouver last week, when a firm of contractors lost a $30,000 job through being two minutes behind in delivering their bid. The contractors in question submitted a bid for vitrified pipe at $30,694, which was recommended for acceptance. One of the other tenderers, however, through his solicitor, raised the objection that the bid was not submitted by 4 p.m., Dec. 12th, as called for in the specifications. They had taken the trouble to investigate and had found that the tender was not deposited at the City Hall until past the hour. Some discussion followed, but it was moved that all tenders not complying with the advertisement be cancelled, and the motion carried. The next highest bid was accepted. The losing firm will at least have the satisfaction of watching developments closely and forming an opinion as to whether the yare indebted to a special interposition of providence or to their own unpunctuality for losing the contract. Be this as it may, the occurrence points a moral. "Better late than never" has noapplication in the contracting business.

A HAPPY NEW YEAR!

The time-honored wish is again our pleasure and privilege.

May this season be gladdened by a retrospect of one of the most successful years in the history of Canada's development. May the dawn of the New Year be brightened by the assurance of continued prosperity.

The story of 1910 is told. Speaking for ourselves, it has been worth the telling, for we have been gladdened and encouraged in our work by countless practical evidences of the reader's co-operation and goodwill.

We are confident that nineteen hundred and eleven will be a great year in the field covered by the CONTRACT RECORD. May we all rise to the occasion. Eternal progress is the price of success. With us, to-day is but a stepping-stone by which we rise to a little higher eminence to-morrow. And so, doubtless, it is with the reader.

Here's to the New Year! Reader, your hand!

Two Important Fixtures for 1911

January 24-27 at Winnipeg:

Annual Convention of the **Canadian Society of Civil Engineers.** Secretary, Professor C. H. McLeod, 413 Dorchester Street West, Montreal.

March 6-11 at Toronto (St. Lawrence Arena):

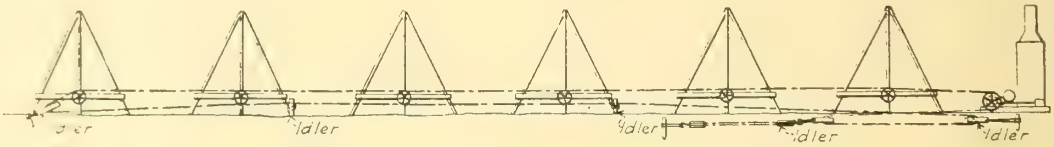
Annual Convention and Exhibition of the **Canadian Cement and Concrete Association.** Secretary, Wm. Snaith, 57 Adelaide Street East, Toronto.

Windsor St. Station Foundation, Montreal

Further Details of the Methods Employed and Equipment Used by the Contractors — The Various Problems Encountered in Excavating

The introduction of the "Chicago" system in the foundation work for the extension of the Windsor Street Station of the C.P.R. at Montreal, and the novel methods employed by the contractors (the Bishop Construction Company, Montreal, associated with the New York Foundation Company) were discussed in the Contract Record of March 9, 1910. Further details of the work, as furnished Engineering Record, are given below. Additional interest will be found if reference be made to the photos and particulars given in the former article:

A large and variable quantity of ground water was encountered. The surface of the rock in many cases had numerous seams filled with mud and water, and had to be removed to a maximum depth of 15 ft. to afford satisfactory solid bearing for the piers. Fortunately, the site was bounded on three sides by streets, so that most of the excavation could be done without jeopardy to adjacent buildings. On the fourth side the new building is an extension of the old station and trainshed, with foundations usually 20 ft. or more from its piers.



Arrangement of Rope Drive for a Row of Pier Shafts

The original contractors started numerous open-sheeted pier excavations, but encountered so much difficulty from the water and from the unstable soil that they abandoned the work. In November, 1909, the work was turned over to other contractors, who completed it the following June.

A rectangular pit about 6½ ft. wide and 22 ft. long was excavated 24 ft. deep, and was lined with two lengths of tongue and groove-sheet piles driven with mauls. The rock was leveled at each end of the pit to receive the foundations for rectangular piers, and the space between the latter was blasted out several feet deeper to form a main sump drained by a 3-in. Cameron steam pump, working continuously. The sump was located at a point where, according to indications, the surface of the rock was lowest, and was supplemented by a number of other pier excavations left for a time unfilled to serve as pumping wells. By their aid and by the use of pulsometers and 2-in. steam siphons in the pier excavations, the latter were kept dry and the work was accomplished in the open without serious difficulty.

The abandoned excavations were found to be generally in very bad conditions, and work on them was resumed by replacing the old lagging with new lagging set just outside of the old, or, where serious trouble was anticipated, by replacing it entirely with sheet piling driven by mauls as the old lining was cut out. In some cases sheeting was driven inside the lagging, and in advance of the excavation.

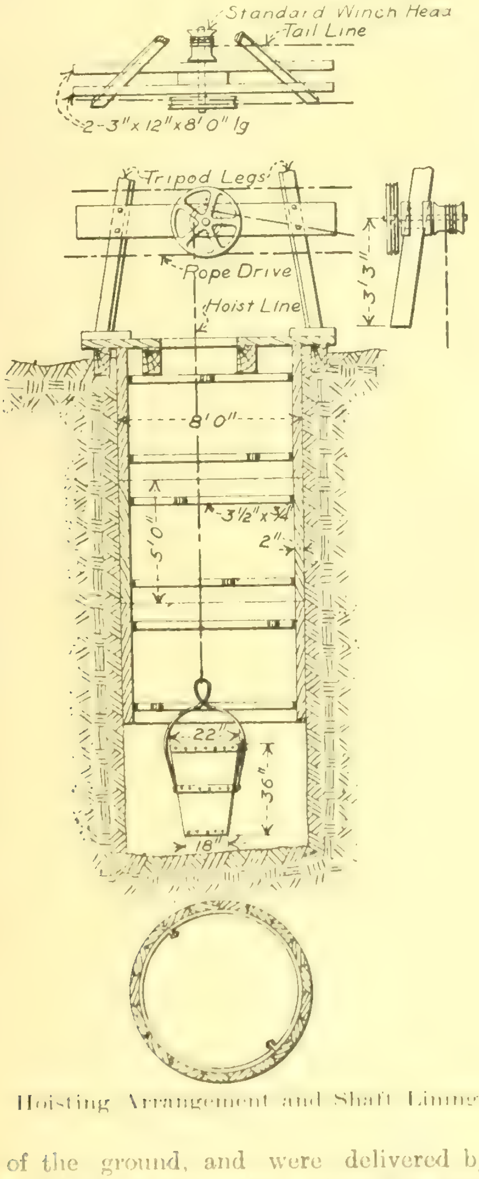
The new pier excavations were made by the standard Chicago method of open digging and lagging. The ground, after being well drained, as already described, was usually firm enough to stand up while the excavation was carried to about 5 ft., and 2-in. vertical lagging, from 5 to 8 in. wide, with planed radial tongue and grooved edges, was set up and maintained in the usual manner by a pair of inside horizontal flange-botled rings of 3 x ¾-in. steel. The excavation was then carried 5 ft. lower, another set of lagging put in place, making butt joints with the lower ends of the first set, and so on. Where there appeared to be reason to fear special difficulty the excavations, about 40 in all, were started with their diameters 18 in. too large, in order to allow for driving inside, if necessary, one set of 16-ft. tongue and groove sheet piles. When the latter were used they took bearing against 4 x 4 x ½-in. angle iron rangers 2 ft. apart, or against 3 x 8-in. wooden rangers when the angle irons could not be received quickly enough. In either case the rangers, like the flanged iron rings, were removed when the concrete was placed.

The material was excavated by hand with shovels, mattocks and picks, and was hoisted in special galvanized iron buckets weighing about 75 lb. each, which were about 3 ft. high, 22 in. in diameter at the top and 18 in. at the bottom. They had swinging bails locked by a catch on one side and were hoisted from the deepest pit in about 1 min. by 1¼-in. Manila lines operated by winch heads engaging rope drives installed by the contractor.

The pits were excavated in sets of 8 or 10 in each of 5 parallel adjacent rows, and the material was thrown out by hand until they had been carried down and sheeted to a depth of 5 or 6 ft., when they were covered by protecting platforms at the surface of the ground with a hole in each for the passage of men and buckets. A small wooden tripod was set on each platform with the ends of the legs permanently secured to it by cleats. On each tripod there was mounted a short horizontal shaft with a 26-in. grooved pulley on one end and a standard 10 x 11-in. winch head on the other end.

The pulleys, on the outside ends of the shafts, were set in the same vertical plane and were all driven by two or three turns of an endless ⅝-in. crucible steel rope about 600 ft. long, which engaged an idler at one end, and at the other end took several turns around the drum of the hoisting engine and then passed around two idler pulleys in the same horizontal plane, one of which was anchored and the other connected to an adjustment tackle. By this arrangement all of the winches in one row were continuously driven by a single engine, and several buckets could be simultaneously hoisted at any time by the men on the platform, who threw two or three turns of the hoist rope around the winch head and tailed off the slack as the bucket rose. The buckets were hoisted just clear of the platform, the latches sprung and their contents dumped by hand on the platform and shoveled into carts, an operation not involving any additional cost because it was performed by the hoist rope men who would otherwise have been idle while the men in the well were digging. Five hoisting engines and rope drives were provided so that one set could be prepared in advance while the excavators were at work on four rows of holes, and was in readiness for them without involving any delay when the holes were completed.

Broken stone and sand were stored in heaps on the surface of the ground, and were delivered by wheelbarrows to the Ransome mixer, where the concrete was made with Lakefield Portland cement. The machine discharged into Ransome carts which dumped the concrete directly into the excavation.



Hoisting Arrangement and Shaft Lining

The contractors for the piers also constructed a 6 x 6-ft. (inside dimensions) steam pipe tunnel, 150 ft. long, between the boiler house and the main building, involving a 9 x 8 ft. excavation 23 ft. below the surface. They also changed 500 ft. of 12 in. and 20 in. sewers to different positions at the station site.

The work involved about 18,000 cu. yds. of excavation and 11,000 yds. of concreting, and was executed in accordance with the plans and specifications of Mr. J. G. Sullivan, chief engineer, and Mr. W. S. Painter, architect for the Canadian Pacific Railroad Company. Mr. Alexander Allaire, manager of the Foundation Company, Limited, was in charge for the contractors.

Day Labor Work in England

In England many cities do a considerable part of their public work construction by day labor instead of by contract. Quite recently the Town Council of Norwich in reversal of its general policy, decided to ask bids on a piece of public work. In connection with the decision the City Engineer, Mr. A. E. Collins, M. Inst. C. E., made the following statement of his reasons for preferring that the work be done by contract instead of day labor:

> My reason for recommending the Executive Committee to carry out the proposed convenience near St. Giles' Gates by contract instead of direct labor is that in the execution of general building works during the past 18 months or two years I have been forced to the conclusion that much of the extra labor engaged by me, or on my behalf, is not satisfactory. The men are not as expeditious as should be the case; there is a tendency for them to regard the corporation as having a "bottomless purse," and to consider there is no special necessity for them to exert themselves. My freedom of action in dealing with employees is not the same as that of a contractor. It is not uncommon for my action to be called in question by members of the Council for discharging men with whom I am not satisfied, and while the evidence upon which I have acted would be considered quite sufficient by a contractor in dispensing with the services of men, yet in my case it might not be sufficient to enable me to answer the very numerous detail questions often put to me. There are a large number of men who may be described as in the regular employ of the corporation, many of them having been selected out from time to time as the most satisfactory of those casually employed; these men can be relied upon to earn their wages and often a bit more. This enables me to carry out the regular work of the corporation with generally satisfactory results, but it is when a sudden expansion of staff is necessitated by some special work, generally of a building character, that I have difficulties in getting works carried out to my own satisfaction as regards cost of labor.

Economy of Contract Work

J. W. B. Blackman, City Engineer of New Westminster, B.C., writes: "I have found your discussion, 'The Contract System vs. Day Labor,' of considerable interest, and regret that I am unable to furnish you with any data. Until quite recently our Board of Works carried out all construction by day labor. Several contracts are now in hand, however, and I am quite confident that the results obtained from these will show a considerable saving over day labor.

Mr. John McLeish, Statistician, Mines Department, Ottawa, writes us regarding a somewhat ambiguous statement contained in the article, "Clay Products," published in our issue of December 7. The following is an extract from his letter of December 12: "In the paragraph on page 48, referring to imports, you state that the total imports for 1909 (twelve months ending March) were $815,033 as compared with $1,079,556 in 1908. There is just a possibility that the average reader may not realize that this refers to brick and tile products only and does not include earthenware, china and crude clays."

The Construction of an Electric Railroad

Methods Employed on the Lansing and Northern Railway, Michigan—General Principles Worth Noting—Details of Equipment and Organization

The construction of electric interurban railways is carried on in generally much the same way as that of steam railways, but differs in a number of respects as to the equipment used and the details of the work.

The Lansing & Northeastern Railway is an electric railway being constructed from Haslett to Owosso, Mich., a distance of 24 1-2 miles. It is of the third rail type of construction, except that trolley construction is used in passing through cities and villages along the line. The Michigan United Railways own and operate an electric railway from Lansing to Pine Lake, a summer resort 8 1-2 miles distant from the city and near to Haslett. This resort affords plenty of business during the summer months, but after the expiration of the season, car service is infrequent; hence the desire to reach out into new territory.

The grading averages about 10,000 cubic yards of earthwork per mile, although on some miles these figures were greatly exceeded on account of the location of sink holes which abound in the lake region. The railway is being built upon private right of way. It is not desired to exceed a 1 per cent. grade as a maximum, although conditions have necessitated the use of 1.75 per cent. grades upon short stretches of the line. Vertical curves are used at summits and sags.

The curves do not exceed 3 per cent. on any track outside of city limits. The maximum curves are 10, 12 and 24 per cent., all being located in cities or villages. All curves above 2 per cent. are spiralled and are elevated as follows: 3 ins. for 1 degree curves, 4 ins. for 2 degrees, 5 ins. for 3 degrees, and 5 1-2 ins. for 4 degrees. In no case does the elevation exceed 7 ins. for any degree of curvature. It has been found that the electric road needs a greater elevation than is usually given on steam railways, on account of the high speed of the electric cars. This condition is due probably to the fact that the centre of gravity of the cars is much lower than on locomotives, thereby bringing a greater strain upon the track.

Track Construction

The track construction is designed to ensure safe high-speed track which can be operated at the minimum cost of maintenance. The existing track (trolley line) is laid with 67- lb. rails. The new work is being laid with 70-lb. track rails, spliced with continuous joints. The third rail is a 60-lb. low-carbon steel rail of the following analysis: carbon, not over 0.14 per cent.; phosphorus, 0.11 per cent.; manganese, 0.40 per cent.; sulphur, 0.08 per cent.; silicon, 0.050 per cent. The full carrying capacity of this rail section is equivalent to 1,091,000 c. m. of copper. At farm and road crossings, where the third rail is interrupted, the current is carried across by means of overhead jumper cable construction. The track rails are bonded with all-wire rail bonds, having compressed terminals which are attached to the outside of the head of the rail.

There are 16 ties for each 33-ft. rail, or 2,560 ties per mile. Each sixth tie is 9 ft. in length to provide support for the third-rail insulator blocks. Cedar ties are used for all work outside of city work; and either chestnut or oak ties for city work.

The grading is done by contract, work being let to the lowest responsible bidder. The balance of the work (such as tracklaying, ballasting, trolley and telephone construction, and building of fences and all other incidental work) is done by a construction company (the Northern Construction Co.) for the railway.

The tracklaying has all been done by hand labor, as the work is not insuch shape or of such extent as to warrant the use of a track-laying machine. The material yard is located at about the middle of the line, and material is delivered at any point along the line by the use of engines and flat-cars. Enough rails are loaded on the cars to keep the force busy for one day, and at night sufficient material is again loaded to carry on the work for the succeeding day. The ties are distributed by teams, piles of ten ties each being placed at intervals of 24 ft. There is one 9-ft. tie in each pair of piles. A gang of six men with a foreman places the ties on the roadbed, lining and spacing them ready for the rails. As the line parallels a steam railway for about half the distance, ties can be delivered at railway stations, so that the team haul is not prohibitive.

Equipment and Labor

In laying track, a flat car equipped with aprons and rollers is used, this car being attached to the front of the train carrying the rails. This car also carries rail splices, bolts and spikes needed. Each rail is run forward along the rollers by manual labor to the first car, where the rail gang is in readiness to receive it and place it in position. When this is done and the forward end is laid to gage and the heel joints are half bolted, the rail joint is attached to the track end, the second rail being laid in the same manner. The rails are then quarter spiked, and the train moves ahead. The rails are laid with broken joints.

The tracklaying gang is made up as follows:

1 foreman, 1 assistant foreman, 6 men unloading rails from cars, 12 men with tongs, to place the rails, 2 splice men, 4 spikers, 2 nippers, 1 man to line ties, and 1 man to distribute spikes.

The back-bolting (behind the train) is done at the same time that the joints are bonded, as it is the practice to bond the rails as soon as they are laid and before the track is ballasted. This back-bolting requires two extra men for the bonding gang, and they are in charge of the foreman of that gang.

Ballast is secured from a gravel pit at a point near the middle of the line, and is distributed from centre-dump cars. The ballast is placed under the track by jacking it up into position, no attempt being made to distribute ballast head of the track. The engines can handle a train of from eight to ten centre-dump cars. After unloading these cars, the spread is made by a centre plow which is attached to the rear or plow car of the train. In ballasting there are from 40 to 50 men in a gang, one man being used to prepare the holes for the reception of the jacks; two jacks and four jackmen give good results with a force of this size.

The pole line for both trolley and telephone construction is erected after the track is laid, thereby permitting all material to be distributed by the work trains. The transmission line (40,000 volts) is strung upon a line of tower construction, but as electric power is furnished by a separate corporation the railway has nothing to do with this work. The trolley line is installed upon wooden poles with bracket construction, excepting in cities, where iron poles and span-wire construction are used.

Vitrified pipe is used for waterway openings up to 18 ins. diameter. Reinforced concrete pipe is used for openings from 30 ins. to 48 ins. diameter. The larger waterways have reinforced concrete culverts designed for Cooper's E-50 loading. Such bridges as there are on this line are pile bridges or trestles.

As to the organization, the construction company has a superintendent of construction, Mr. N. B. Atwood, who cares for track work, ballasting, line work and all other work incidental to the construction of the railway above sub-grade. He also has charge of the construction and placing of all the openings for waterways. He is assisted by the track, line and bridge foremen and the material clerk, together with the office force required to handle the pay-rolls of his department. The Engineering Department of the railway company is in charge of Mr. W. J. Sullivan, as Chief Engineer, assisted by two field assistants and by a draughtsman who takes care of the design of structures and substations. The Engineering Department has charge of the designing and building of all structures, the grading, the preparation of the preliminary monthly estimates, setting of ballast stakes and track centres, and all the work incidental to such a department.—Engineering News.

Effects of Temperature and Moisture on Road Surface Treatment

It is generally recognized that the success of a road surface treatment for dust-laying depends to a large extent upon the condition of the road as to temperature and moisture at the time of the treatment. Some interesting information regarding these road surface conditions are given in a recent issue of our English contemporary, "The Surveyor. It is stated there that experiments have shown that approximately 18 to 22 per cent. of an average macadam road consists of dust and fine particles of stone, small enough to pass through a fine sieve of 40 meshes to the inch, and of this 14 per cent. is as fine as cement. Thus 18 to 22 per cent. weight of a macadam road consists of very fine particles—that is, after all moisture has been removed—but it is also worthy of note that after a period of 12 hours without rain and with about six hours' bright sunshine, the fine material extracted from a macadam road contained approximately 20 per cent. of moisture, although the road surface was apparently quite dry. The following experiment is cited in "The Surveyor" to show that the presence of moisture in a road is detrimental to its successful treatment with a tar composition:

A quantity of fine material from a macadam road and containing 20 per cent. of moisture was divided into two portions, both of which were well compressed in a mould into small slabs 6 inches square by 2 1-2 inches thick. On the surface of both an equal quantity of a reliable tar compound was poured, one of the slabs having been previously dried. After a period of 24 hours, the tar composition had penetrated seven-eighths inch into the dry slab, but only five-eighths inch into the slab containing 20 per cent. of moisture. It is therefore evident that moisture prevents the penetration of a tar composition.

Portions of both slabs were examined microscopically after the penetration of the tar composition, when it was found that in the dry slab the particles were thoroughly coated with the tar composition and the interstices between the particles were also full of tar composition. In the other slab the penetration was seen to be irregular; the particles were only partially coated and some of the interstices were void, instead of being filled with the tar composition.

Apparently, then, even where a tar composition does penetrate a damp road, the tar does not get hold of the fine particles or fill the interstices as in the case of a dry road. Further, the dry slab after some days set into a fairly stable cake, which could be handled without breaking, but the moist slab showed no signs of setting. It further appears, therefore, that moisture resists the binding action of the tar composition. It will readily be seen that the effect of moisture in a road to be treated with any tar compound is extremely detrimental, but temperature also plays an important part.

As to the effect of temperature it is stated that roads were treated with a particular composition applied by the same machine, one road being treated about midday and the other about midnight. In the first case the temperature of the road exposed to the sun's rays was about 80 degrees F., while the temperature of the road treated at midnight was about 40 degrees F. In the first case the tar composition readily penetrated the road, while in the other case the cold road surface chilled the composition, causing it to congeal on the surface. Much of it never penetrated tthe road; but was subsequently carried off the road surface by the traffic.

The Quebec Legislature is considering a revised good roads bill with a view to giving greater assistance to the smaller municipalities throughout the province. If the bill now contemplated becomes law, it will be possible for every municipality, even if there are fifty in one county, to obtain a minimum grant of $400. Any municipality will be able to obtain an additional grant of $500 for macadam roads, provided that they bind themselves to maintain in good order a section of a road upon which a sum of not less than a thousand dollars shall have been spent in macadamizing. The Government contemplates the purchase of a stone crusher for the use of the municipalities. It is understood that the appropriation for good roads next year will be $250,000 instead of $75,000.

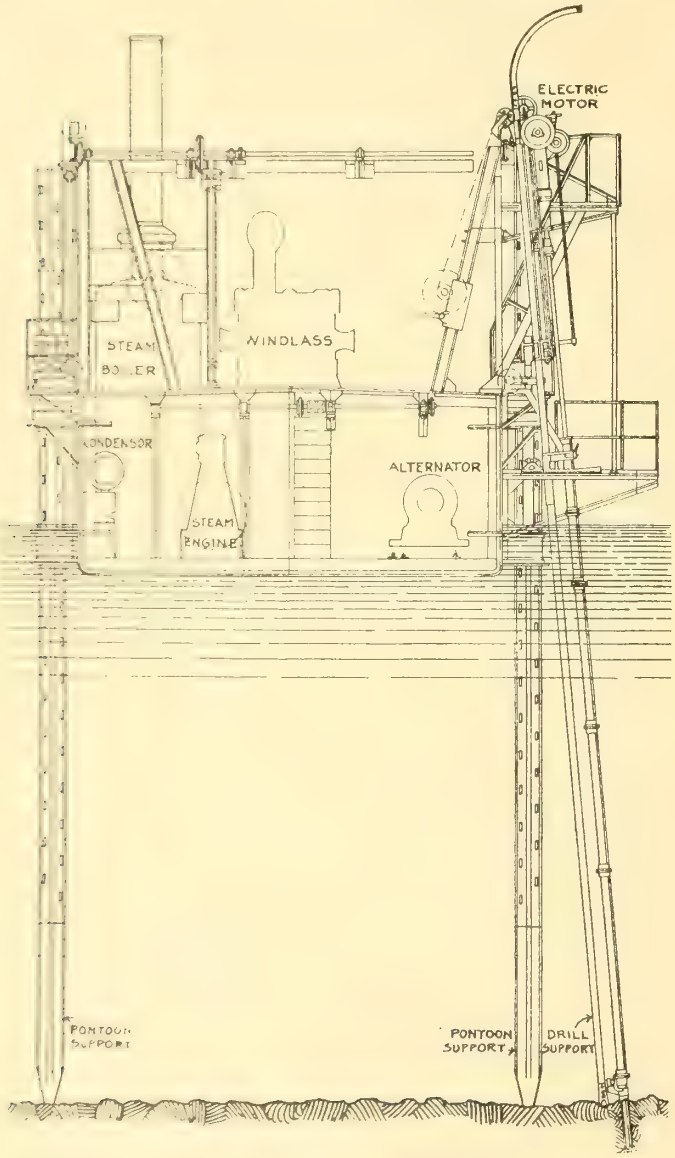
The Galt Art Metal Company, Limited, Galt, Ont., have favored us with one of their souvenir Christmas pocket books, a useful and durable article that will afford a constant reminder of this enterprising firm. A policy for a thousand dollars on the Imperial Guarantee and Accident Insurance Company is enclosed with the folder.

An injunction of cement was the novel method lately adopted to make strong and serviceable two crumbling stone railway bridges at Hamburg, Germany. The arches—fifty-one feet in span—were cracked in all directions and small holes were bored partly through the masonry at the sides of the cracks, and thin cement mortar was forced into the apertures at a pressure of five atmospheres. When this had hardened, the stone work was found to be thoroughly consolidated.

The Brandon Electric Light Company has been the pioneer in the establishment and development of public utilities in the province. From a plant of 50 horsepower it has developed a system of power-generating plants of nearly 4,000 horsepower; and it is altogether likely that the new system of heat transmission will meet the necessities of the public in a most satisfactory manner.

Submarine Rock Excavation

As an alternative to the simple but tedious process of drilling holes by divers and blowing up submarine rocks by dynamite, the Lobnitz method has been used with advantage in many places for removing obstructions from and deepening canals and harbors. The Lobnitz aparatus consists of a pontoon provided with one or more hoists of the pile-driver type for operating a pointed "monkey" weighing from 10 to 15 tons. Repeated blows from this weight disaggregate the rock to be removed, and the debris are cleared away by dredging.



Rock Excavating Pontoon

Another system is that adopted by the port authorities of Trieste, where a pontoon is employed having two percussion drills operated by electric motors, and capable of perforating vertical or slightly-inclined holes of about 3 inches diameter by 6 feet 6 inches deep, in which explosives are subsequently placed and discharged.

We give a cross-section illustrating the general arrangement of the pontoon, which measures 60 feet long by 20 feet wide, and in order to prevent movement during the operation of the drills is furnished with four tubular cast-iron supports each with a pointed end. The supports are lowered by means of worm gearing driven by a steam-engine, and the operation is continued until the ponton has been raised bodily for a few inches, the pressure thus developed ensuring the stability requisite for working the percussion drills. The exterior diameter of the supports is 10½ inches, and, being composed of jointed sections, their length can be adjusted according to the depth of water in which the apparatus may be required to work.

During trials conducted at Trieste the pontoon was raised by means of the supports so as to exert the total pressure of 105 tons, and preserved perfect stability for a period of three days.

The two drills are mounted outside the hull of the pontoon, and, being suspended from an articulated joint, can be moved to any angle within 15 degrees from the vertical. The stem of the drill is hollow, so as to permit water to be injected at the point for cooling purposes. The drill strikes 380 blows per minute, and is turned slightly about its axis after each blow.

When the drill-holes have been perforated and charged the pontoon is hauled away from the site by means of cables attached to the windlass, and is brought back to continue work after the mine has been fired.

Training the Engineer-Contractor

Editor Contract Record:

I believe in teaching engineering students as much of the business features of engineering as possible without interfering too greatly with instruction in the fundamental principles of engineering science. If the engineering courses in the technical schools and universities could be lengthened to five or even six years, it would be possible to instruct students in a number of matters that at present have to be ignored. For the last twenty-five years I have been advocating five-year courses in civil engineering and now they are commencing to be given. It is my opinion that ten years hence all of the leading technical schools and universities will have extended their engineering courses to five years.

Very truly yours,

J. A. L. Waddell.

Kansas City, Mo., December 20th, 1910.

Wages and Compensation at St. John's, N.B.

St. John, N.B., Dec. 15, 1910.

Editor, Contract Record:

Replying to your inquiry concerning the employment of labor. The method in vogue in the city of St. John is to employ workmen at whatever the ruling prices may be. The rate of wages varies from $1.25 a day for the poorest quality of common laborers up to $3.00 a day for the best of skilled mechanics.

We have a law, recently enacted, which provides that if a workman is injured through the negligence of a fellow workman to such an extent as to incapacitate him for labor he must be paid one-half time for a period of about three months.

Yours very truly,

Wm. Murdock, City Engineer.

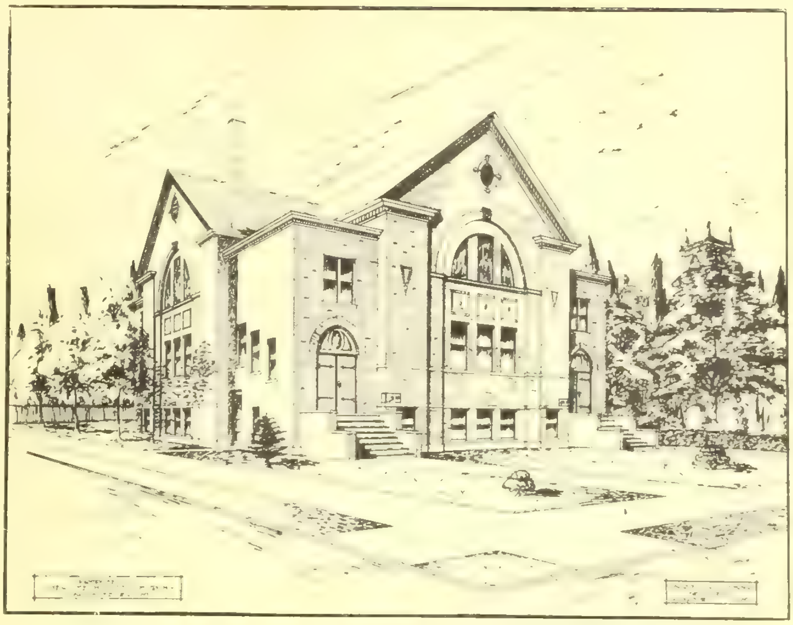
We are informed by Mr. Geo. S. Gould, secretary of the London, Ont., Builders' Exchange, that a Builders' Exchange has been organized at St. Thomas, Ont., with the following officers: President, A. E. Ponsford; Vice-President, W. J. Green; Secretary-Treasurer, E. O. Penwarden. Mr. Gould states that there was much enthusiasm at the inaugural meeting, which furnished many proofs of the wide sphere of usefulness for the new Exchange.

New Methodist Church, Wallaceburg

The new Methodist church at Wallaceburg, Ont., illustrated herewith, will be 80′ x 76′, constructed of brick, steel, and stone.

The basement provides for entertainment and dining rooms, four class rooms, kitchen, store room, fuel room, toilet rooms, etc. The auditorium and gallery seat 1,200 people. At one end of the auditorium is an annex which is to be used for a Sunday school room. This will open into the main auditorium by a series of folding doors. The choir loft will contain the organ and seat fifty choristers. On the left hand corner a vestry 16′ x 16′, has been provided for, with a circular staircase to basement. On the other corner is a choir room 16′ x 16′, which can also be reached from the basement by a circular staircase. Over the respective rooms are a board room and a secretary's room with entrance from the gallery. The building will be heated by three hot air furnaces. The main auditorium floor has a proper slope in every direction so that a good view may be had from any point in the church. The roof is supported by steel girders extending from the different pilasters. The ceiling will be panelled off with plaster moulds. All interior finish throughout the building will be Georgia Pine stained, rubbed down and waxed. The ornamental glass for the three main windows will be furnished by the Church Board at a later date.

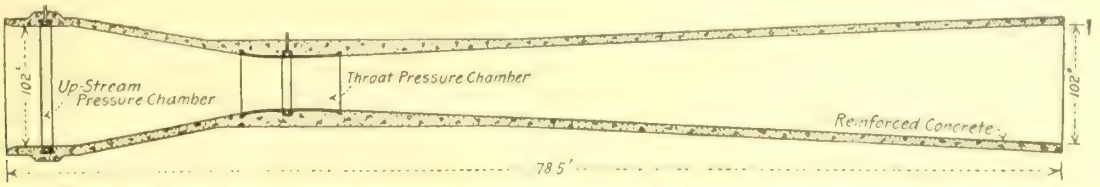
The church in general will be of a modern type and will cost $38,000. Tenders have already been received and work will commence early next spring. Messrs. Jacques & Williamson, Windsor, Ont., are the architects.



New Methodist Church, Wallaceburg, Ont.—Architects: Jacques & Williamson, Windsor, Ont.

A Large Venturi Meter for the Montreal Water Works

The Builders Iron Foundry of Providence, R. I., has completed parts of a 102-inch tube for a new conduit which will supply water for the municipal system of Montreal, Canada. The head is low at this point and, as the conduit is of re-inforced concrete, it was decided to make the cones of the meter of the same material. The up-stream pressure chamber and the throat section are of cast iron, the latter being bronze lined. The construction is shown in the accompanying figure.



Section through 102 in. Venturi Meter for the Montreal Water Supply System

It is not expected that this meter will be required to measure beyond 70,000,000 Imp. gals. (84,000,000 U. S. gals.) per 24 hours, but if the head should be increased, to increase the capacity of the conduit, the meter will register up to 230,000,000 U. S. gals. per 24 hours.

The registering and recording attachment is actuated by floats in wells connected to the pressure pipes, similar to the Divi Island plant. The counter dial is a straight-reading type and shows total number of gallons passed. A chart recorder shows the rate of flow at all hours.

The Builders Iron Foundry has under construction the parts for a much larger meter than any yet installed anywhere. This is for the New York City Catskill Aqueduct, and it will have a maximum inside diameter of 210 ins. and a throat diameter of 93 ins.

Foreign Cement Barrels

The European cement barrel, especially that used for export trade, is a very substantial affair. The foreign barrel is made of Norway spruce. Its staves are tongued and grooved as well as jointed while the head is of the usual construction of the same wood. The hoops are of cherry wood, a much better grade than used in domestic barrels, and there are also two hoops of steel. When ready for packing the barrel is lined with black waterproof paper, through which cement cannot sift and moisture and water cannot penetrate. Some shipments from Belgium involve ocean voyages of thousands of miles and it is said the cement invariably arrives in fine condition when packed in these barrels.

The province of Ontario expended over $500,000 on good roads work during the season of 1910, as compared with $435,000 during 1909.

A tax upon motor oil, together with the revenue from car licenses, has netted the old country $5,000,000 in one year. This will be distributed upon road improvements all over England. Applications have been made for grants amounting to upwards of $27,500,000.

New Waterworks System at Vancouver

Additional Supply Obtained from Seymour Creek — Noteworthy Features of Design and Construction — Detailed and Summarized Cost Data[*]

By H. M. Burwell

The City of Vancouver, B. C. has heretofore depended on Capilano Creek for its water supply. This creek empties into the northerly side of Burrard Inlet at a point about a mile and a half from the city. The supply has been adequate up to the present time, but owing to the recent rapid increase in the population, the necessity of securing water from another source was apparent for the following reasons:

(1) Capilano Creek at its extreme low water stage would not afford a sufficient supply for the future population.

(2) Owing to the rapid fall of this creek and its narrow valley it would be impossible to create storage reservoirs at a permissible cost.

(3) The crossing of the supply main under the First Narrows (being the entrance to Vancouver Harbor), made a dangerous point in the system, several of the submerged pipes having already been broken by ships' keels.

Junction of Wood and Iron Pipe, Seymour Creek

The city council therefore decided to secure an additional supply from Seymour Creek. This new system is now almost completed, and the following is a description of its chief features.

Seymour Creek empties into the northerly side of Burrard Inlet at a point about three miles east of the city. It is a beautiful, clear mountain stream (except once or twice annually, when it becomes a raging torrent), and has a fall at the lower part of about 65 to 70 feet per mile. Its drainage area is about 80 square miles, and its mean annual run-off about 500 feet per second. The extreme low water flow is about 80 cubic feet per second. The source of the stream is a lake of from 400 to 500 acres, at an elevation of 3,200 feet above sea level. In this neighborhood there are also two glaciers, which will help to maintain the supply of water during the summer months.

The waterworks intake is located seven miles above the mouth of the stream at an elevation of 465 feet above sea level. Owing to the large amount of boulders, gravel, and finer sediment which the creek carries down during freshets, it was necessary to design the intake so that it would not become completely choked up under such conditions, and means had also to be provided to prevent the finer sediment entering the pipe.

The intake is formed by a hewn cedar crib with rock filling, 13 feet high. It has two openings, each 5 feet in width, and on the face of each opening is placed an oak rack, set in an iron frame. The water enters the intake at right angles to the direction of the stream, the faces of the racks being parallel with the axis of the stream. This allows boulders and most of the heavy sediment to be swept away, as the current of the stream is stronger than the current of water entering the intake.

About 50 feet below the intake a low weir, composed of large, broken rocks, extends across the creek. This weir is only of such height as to keep a sufficient depth of water on the intake during extreme low water periods.

The water, after passing through the racks, enters an 11 x 14 feet forebay. From this there is an open conduit 6 feet in width, of hewn cedar cribwork. This conduit extends down stream along the bank of the creek for a distance of 300 feet. Its upper end is furnished with a 6 x 10 head-gate. At the lower end of the open conduit is placed a scour-gate, discharging into the creek, to flush out the sediment which may enter the intake and deposit itself along the flume.

Just below are located two sediment tanks, designed to separate the finer sediment and floating matter from the water and prevent it entering the pipe. These tanks are built of 6 in. x 1 in. sawn cedar timbers, the sticks all being placed flat and drift-bolted together, with frequent tie-sticks extending into the bank. Each tank is 20 x 100 x 6 feet deep, and is lined with 3 inches of concrete, fastened on the sides with expanded metal, spiked to the timber walls.

The floors of the tanks were made by first covering the ground (which consisted of a compact mass of boulders and gravel), with expanded metal, held in place by numerous ¾-inch anchor bolts driven between the boulders. On this as a bed 3 inches of concrete was floated.

Each tank is supplied with a 4 x 5 feet inlet gate, and there is also one of the same dimensions at the lower end.

A few feet in front of the lower gates are placed two rows of screens, extending across the entire width of both tanks. There are 16 screens in all, each 5 feet square, having iron frames, backed with heavy steel wire netting, and fitted in front with light wooden frames on which the fine screens are fastened. The screens are operated by a hydraulic hoist, which lifts a row of 8 at a time, the whole row being cleaned by means of a strong jet of water. The refuse falls into a cement trough in the floor and is carried out into the creek. The water for this work is supplied from a small mountain stream through a 4-inch pipe, under a 125-foot head.

---

[*] Read before the General Section of the Can. Soc. C.E., Dec. 8, 1910

Across the bottom of both tanks is placed a weir or baffle, 18 inches in height, situated about 6 feet in front of the screens. Its duty is to prevent the sunken matter and heavier sediment from coming in contact with the screens.

Just above the weir is built a skimmer, which crosses both tanks. This contrivance makes provision for the overflow and carries off all floating matter.

Each tank is provided with a scour-gate, 24 inches square, placed on the floor. A tank can thus be flushed out without interfering with the supply.

The Supply Main.—Before constructing the supply main, a good wagon road was built along the pipe line. It has a maximum grade of 4½% and a total length of 7 miles. For the first 3¾ miles below the intake it is located on the westerly side of Seymour Creek. It then crosses the creek on a steel bridge, and extends along the easterly side to the Second Narrows of Burrard Inlet. About half a mile below the bridge the creek passes through the Seymour Canyon, a deep cleft in the rock, having almost perpendicular walls. Here the road is excavated through rock along the edge of the canyon for some distance and is very picturesque.

Wood-stave Pipe.—The pipe line is along the side of the road farthest away from the creek. For the first 1,000 feet it consists of a continuous wood-stave pipe, 36 inches inside diameter. From this point, where there is a slight summit in profile, the wood-stave pipe is 30 inches diameter. The staves, of which the pipe is built, have a thickness of 2 inches, and were chiefly fir timber, although some cedar was used. These staves were manufactured near the site of the work. The lumber used in the sediment tanks and intake buildings was also cut on the works, a portable sawmill and logging donkey engine having been procured for this purpose.

The price of the class of lumber required would have been $40 per 1,000 feet B.M. if purchased at the mills in Vancouver. The necessary haulage and handling would have increased the cost to at least $50 per 1,000 feet. The actual cost of the lumber used in the pipe, including equipment, was $28.50 per 1,000 feet.

The wood pipe is supplied with two 30-inch gate valves, one placed about 1½ miles and the other 3 miles below the intake. These positions were selected partly for use in case of emergency and partly to facilitate the construction of the pipe. The pipe in one place will be subjected to a pressure due to a static head of 210 feet, and on this portion (which is near the bridge) the steel bands are spaced 1¾ in c. to c. The bands are of ½-inch steel, fitted with forged steel shoes, and have an average spacing of 3½ inches c. to c.

Bridge Crossing.—The crossing of the bridge is made with a 32-inch continuous steel riveted pipe, with bends and special connections for wooden pipe at both ends. It rests upon the floor-beams of the bridge, and is provided with a 6-inch blow-off valve at the centre. The watertight connections between this steel pipe and the wooden pipes are made with ordinary lead joints. Where the pipe line crosses ravines or small hillside creeks, it is supported on substantial cedar trestles, and is enclosed in cedar cribwork filled in with sand and gravel.

In places where it is thought there might be danger from fires, the pipe line is supplied with 2-inch globe valves, with a length of hose and a nozzle in each place, enclosed in a small house.

New Intake for the Vancouver Waterworks System

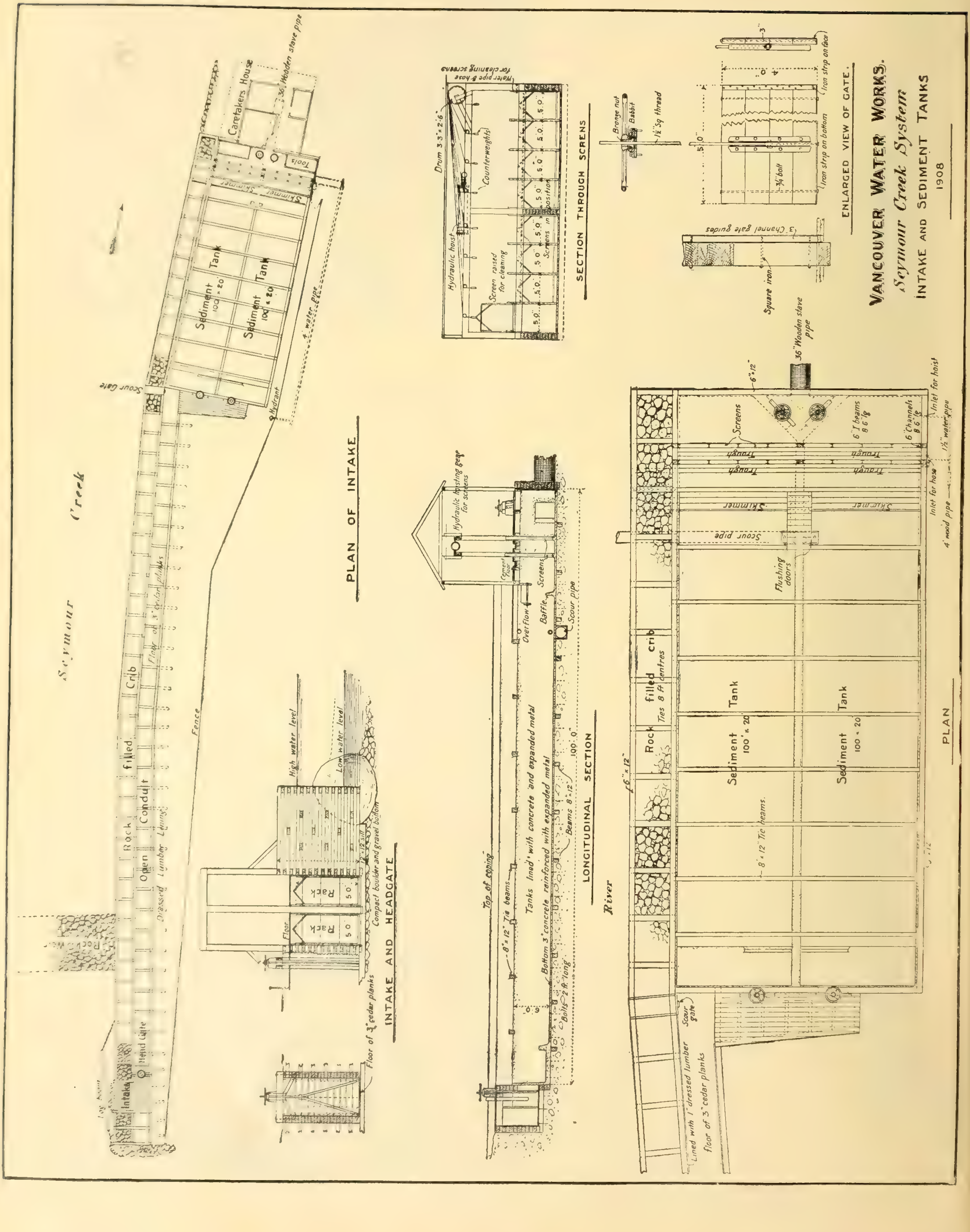
Welded Steel Pipe.—From the canyon down to the Second Narrows the pipe line is constructed with 24-inch lap-welded steel pipe. The shell of the pipe has a thickness of 5-16 inch (being the standard thickness of plate with which this kind of pipe of the above diameter is made). It is in about 19-foot lengths, and is known as "Stewart's patent inserted lap-welded steel pipe," costing $3.80 per foot delivered at Vancouver.

At the upper end the pipe is supplied with a gate-valve and a 6-inch blow-off. At the Narrows it connects with the two 18-inch submerged mains by means of a Y special, and is supplied with a 6-inch blow-off placed within a concrete well, which also encloses the Y and two 18-inch gate-vaves. This portion is covered with tidal water at times.

Submerged Mains.—The total distance across the Second Narrows is 2,600 feet, but only 1,000 feet of the channel is deep water, the rest being tidal flats uncovered at low water.

In the central portion of the channel, which has a depth of 85 feet at low water, two 18-inch flexible cast-iron pipes are used, in lengths of 9 feet, with a 1½-inch shell. Each pipe length weighs 3,300 lbs. and each joint is capable of a deflection of 19°. The pipe is of the ball and socket type.

The Finishing Touch on the Seymour Creek Pipe Line



VANCOUVER WATER WORKS.
Seymour Creek System
INTAKE AND SEDIMENT TANKS
1908

The ball is formed by running lead into the joint after the pipe has been placed.

The shore connections, amounting to 1,000 feet, are made partly of steel and partly of ordinary cast-iron pipes.

An interesting feature of the work was the placing of the flexible pipes along the bottom of the deep channel. This was accomplished by first building a wooden trough or shute on the tidal flat at the northerly shore, directly in line with the crossing, and extending out to the edge of the deep channel. The shute was made of 3 x 12-inch lumber, supported on trestles, and of a length equal to that of the flexible main. It was well greased on the inside, after which the pipes were placed and joined together, the bell ends each resting on a short board forming a sort of sled, used to keep the pipes in place and to reduce the friction in sliding them along.

A 1½-inch steel cable was then drawn through the pipe and fastened at each end to eye-bolts of 2-inch Norway iron of about 8 feet in length. These passed through cast-iron caps placed at each end of the pipe. The rear bolt was threaded for about 6 feet, and provided with a large nut by which the cable inside of the pipe was made taut. The front end cap was provided with a stuffing box to permit the movement of the eyebolt outward as the strain came on the inside cable, without admitting water into the pipe.

Three 1½-inch steel hauling cables were then fastened to the pipe, one about one-third the distance back from the front end, one at the front end, and the other was fastened to the above mentioned eye-bolt.

As the Canadian Pacific Railway passes along the southerly shore of the Narrows, close to the water's edge, a bridge had to be erected over the track to prevent interference with traffic. The cables were carried over on top of this bride, which, owing to a high bank on the south side, was built on a slope of about 15°.

The platform was extended uphill to a large spruce stump, which was used as the chief anchor for handling the pipe. At the lower end of the platform, which was 85 feet in length, there was a wooden roller, over which the hauling cables passed.

The hauling was performed by means of 5 capstans, operated with horses, transmitting a strain of 180 tons to the hauling cables.

In hauling the several 12-inch mains across the First Narrows, in the Capilano system, it was noticed that, owing to leaks at the joints, the pipes were always full of water before the ends reached the south shore. This added to the weight and made the hauling more difficult, especially as the last part of the haul was up a steep hill. The new main being much heavier than any previously hauled, it was decided, in order to avoid leakage, to instal an aircompressor and maintain a pressure of from 50 to 60 lbs. in the pipes while being hauled. The haulage was done by day labor without unusual difficulty.

The conduit from the Second Narrows to the city, where it connects with the Capilano system (a distance of about 3 miles), is a 24-inch lap-welded steel pipe, with the exception noted below. Its connection with the submerged pipe is made by means of a Y, the same as on the north shore, but, in addition, the two 18-inch gate-valves have two 18-inch check-valves bolted to them. The pipe passes under the railway tracks in a concrete-lined tunnel, in which is placed a special steel-riveted pipe, with the necessary T and bends, all riveted together and resting in concrete saddles and concrete backings at the bends.

The pipe line, after passing through the tunnel, follows the railway right-of-way for a distance of about half a mile, and, in accordance with an agreement with the railway company, this portion is made of ¾-inch steel plates.

The total length of the main from the intake to the connection with the Capilano system in the city is about 10½ miles, and the the capacity of the system 9,000,000 gallons per day, or about equal to that of the present Capilano system.

Cost Data.—The wagon road along Seymour Creek was built by contract at a cost of $44,500. The work contained some very heavy side-hill cuttings and a considerable quantity of rock work.

The pipe trench for most of its length was excavated through a compact mass of large boulders and gravel, deposited by glacial action. That portion along the edge of the canyon was excavated through granite rock.

The trench for the wooden pipe, 4 feet in depth by 5 feet in width, was excavated by contract, the price being 49 cents per lin. foot. The rock work was paid for per cubic yard, making the average cost of the trench 73 cents per lin. foot.

Cost of Wood-stave Pipe.

	Per lin. ft.
Excavation of trench (contract)	$0.73
Building pipe	.39
Steel bands, including haulage	1.38
Lumber, including haulage	.65
Tongues, including haulage	.02
Paint for bands, including haulage	.02
Inspection	.01
Back-filling over pipe (day labor)	.25
Total	$3.45

Cost of the Steel Pipe.

Excavating trench (day labor)	$0.85
Steel pipe	3.80
Laying and making joints, including lead	.23
Back-filling	.25
Haulage of steel pipes (day labour)	.07
Total	$5.20

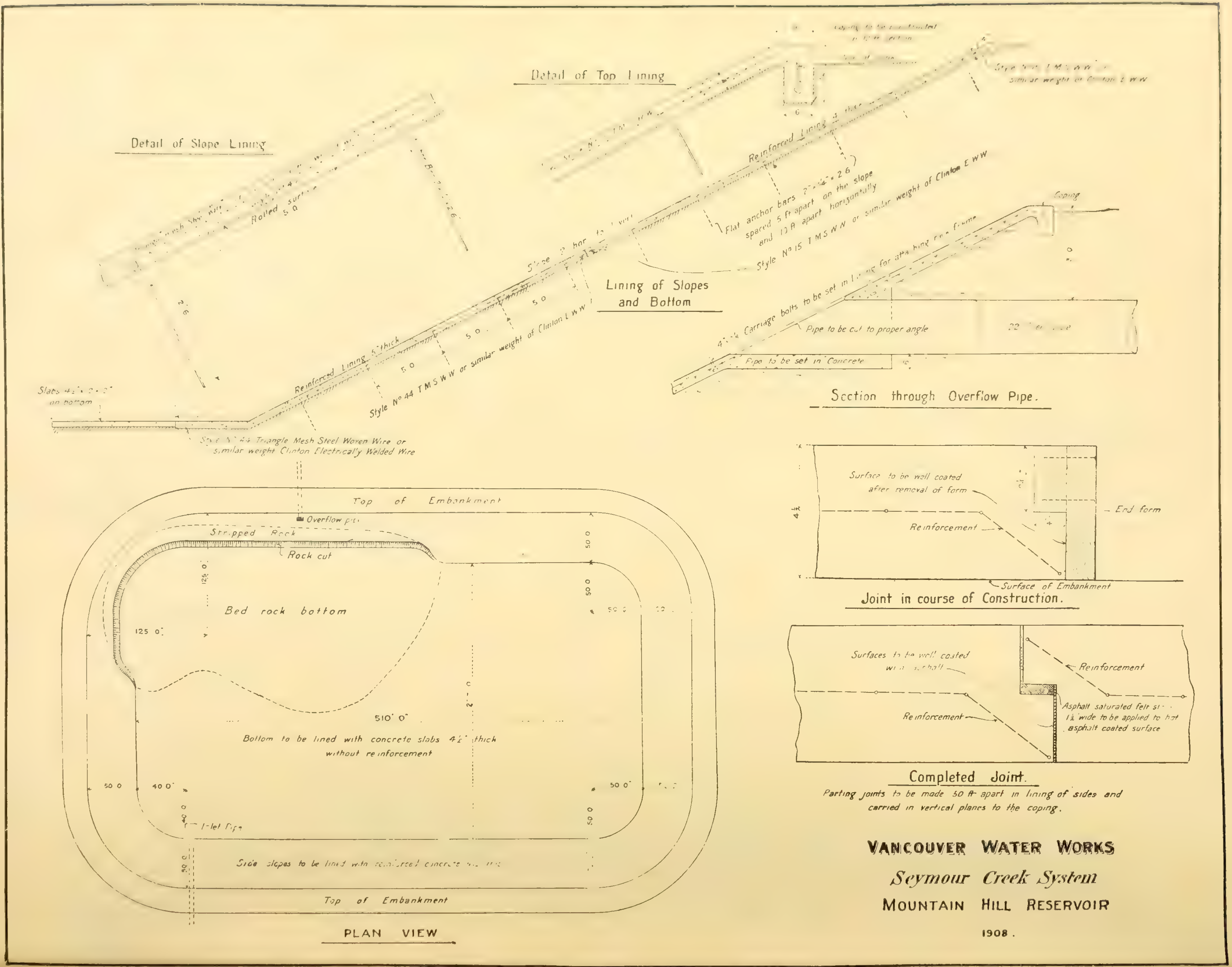
SUMMARY OF THE COST OF THE WHOLE WORK PERFORMED.

North Side of Burrard Inlet:

Wagon road (contract)	$ 44,500
Wharf and approach at Narrows (contract)	6,000
Steel bridge	7,000
Warehouse and camp buildings	1,500
Intake and sediment tanks, including lumber, screens, gates, complete (day labor)	19,500
Wooden-stave pipe line	78,500
Steel pipe line (day labor)	76,500
Gate-valves, special steel pipe, bends, air-valves, etc.	3,500
Trestles and culverts (day labor)	3,500
Repair work to road, cutting out slides and corduroy work (day labor)	3,500
Protection work to pipe line, riprap, and crib work (day labor)	5,500
Telephone line	1,000
Portable sawmill	6,000
Logging donkey engine	3,000
Rough lumber in stock	9,000
Teaming	1,000
Total	$270,000

Submerged Main:

Flexible c i pipe, 1,000 feet	$8,500
Hauling flexible pipe (day labor)	4,000
1,600 feet steel and c i pipe (shore connection)	7,500
Laying pipe and making shore connections, including delivery from city of all pipes	1,000


Detail of Top Lining
Detail of Slope Lining
Rolled surface
5 0
2 6
Reinforced Lining 4" thick
Flat anchor bars 2" x ¼" x 2 6 spaced 5 ft apart on the slope and 13 ft apart horizontally
Style No 15 T M S W W or similar weight of Clinton E W W
Lining of Slopes and Bottom
Reinforced Lining 5" thick
5 0
5 0
5 0
Style No 44 T M S W W or similar weight of Clinton E W W
Slabs 4½" on bottom
Style No 44 Triangle Mesh Steel Woven Wire or similar weight Clinton Electrically Welded Wire
Coping
Carriage bolts to be set in lining for attaching frame
Pipe to be cut to proper angle
Pipe to be set in Concrete
Section through Overflow Pipe.
Surface to be well coated after removal of form
4½
End form
Reinforcement
Surface of Embankment
Joint in course of Construction.
Surfaces to be well coated with asphalt
Reinforcement
Reinforcement
Asphalt saturated felt strip 1½ wide to be applied to hot asphalt coated surface
Completed Joint.
Parting joints to be made 50 ft apart in lining of sides and carried in vertical planes to the coping.
Top of Embankment
Overflow pipe
Stripped Rock
Rock cut
50 0
125 0
50 0
Bed rock bottom
125 0
510' 0"
Bottom to be lined with concrete slabs 4½" thick without reinforcement
50 0
40 0
50 0
50 0
Inlet Pipe
50 0
Side slopes to be lined with reinforced concrete
Top of Embankment
PLAN VIEW

VANCOUVER WATER WORKS

Seymour Creek System

MOUNTAIN HILL RESERVOIR

1908.

Gate-valves and specials	2,500
Lumber and tools	500
Protection work, riprap, and concreting	1,000
Lead	2,000
Total	$ 27,000

South Side of Burrard Inlet:

Tunnel under railway track, concrete-lined, with 40-foot shaft	$2,000
Special steel riveted pipe, with concrete saddles and anchoring	2,000
Steel main to city, connecting with Capilano complete	86,500
Total	$91,000
This brings the cost of the Seymour Creek system at the present date up to	$388,000
For engineering and superintendence	11,000
Total	$399,000

This amount does not include the cost of the land purchased for reservoir sites, foreshore land, pipe line right-of-way, and legal expenses. The cost of the ordinary labor varied from $2.80 to $3 per day of 10 hours.

The City of Vancouver holds records of water on Capilano and Seymour Creeks amounting to 2,900 B. C. miner's inches. This amount will be sufficient to supply a population of about 400,000. In order to make use of the water from any steam in British Columbia, it is first necessary to apply to the Government for a water record.

The combined water systems, as at present developed, are estimated to supply a population of 180,000.

Reservoir.—In addition to the above work there is now being constructed a 24,000,000 gallon distribution reservoir to be used for a high-level system. This reservoir is situated about 1 mile south of the city boundary on the top of a rocky hill, known as Little Mountain, and has an elevation of 395 feet above sea level at high water mark. At present it is connected with the Seymour Creek system by a single lap-welded steel pipe, 18 inches in diameter, but it is the intention to have it also connected with a high pressure pipe from the Capilano Creek system. This will insure safety from interruption in the supply and render the system an ideal one.

The formation at the site of the reservoir consists of a top layer of very compact sand, gravel, and boulders, from 3 to 4 feet in thickness, overlying hardpan, which rests on trap rock. The material excavated was used to form the banks of the reservoir, the finer being placed on the inside slopes and the coarser material and rock on the outside. The total excavation was about 80,000 cubic yards, of which 18,000 cubic yards were from solid rock. This rock was placed around the outside of the earth-bank, forming a riprap extending from the bottom to the top of the bank for its entire length, and adding to its stability as well as greatly improving its appearance. The excavation was performed under contract by Mr. M. P. Cotton, of Vancouver, who received 54 cents per cubic yard for earthwork and $1 per cubic yard for rock-in-place.

With the exception of the top layer of about 3 feet, the entire mass had to be drilled and blasted, after which it was excavated with a steam shovel and hauled to place by dump cars. For this purpose a track was carried around on top of the bank and shifted as the work advanced. The earth-work in the bank was completed last autumn, so that it might settle during the winter. The wages paid on the work ranged from 25 cents to 35 cents per hour.

Tenders are now being asked to construct the concrete lining, which will be proceeded with at once. The bottom lining will consist of concrete slabs not greater than 12 feet square by 4½ inches thick, with V-shaped joints, which will be filled with the best quality of clay or asphaltum.

The side slopes, which are 2 hor. to 1 vert., will be lined with reinforced concrete, with expansion or parting joints every 50 feet. This lining will have an average thickness of 4½ inches, and will be reinforced with Clinton electrically-welded wire. The reinforcement for the bottom half will weigh about 42 lbs. per 100 square feet, and the top half 24 lbs. per 100 square feet. This reinforcement will be held in place during the construction of the lining by flat anchor rods, driven into the bank, and the concrete will be poured into the forms in a wet condition.

All concrete used in the work will consist of the following ingredients: 1 part of Portland cement, 2 parts coarse, sharp sand, 2 parts broken rock, free from dust or dirt, which will pass through a ring 1 inch in diameter.

Inlet Pipe.—The inlet pipe is of continuous ⅜-inch riveted steel, having a diameter of 24 inches and a length of 175 feet. This pipe was placed in its trench and embedded in concrete before the excavation of the reservoir. It passes through two concrete bulkheads or cut-off walls, and is provided at the reservoir end with a balanced valve arrangement, designed by the writer, and at the outflow end with a scour-gate, a swing check-valve, and an automatic regulating valve.

The second submerged main, with shore connections complete, cost about $19,000, and the pipe line to the reservoir, including valves and specials, about $75,000. The probable cost of the new reservoir will be $80,000. This will bring the total cost of the Seymour Creek System up to about $575,000, its capacity being about 9,000,000 Imperial gallons per day.

Canada's Longest Concrete Bridge

The reinforced concrete bridge at Weston, Ont., known as the Wadsworth Bridge, was officially opened to the public on the 8th inst. This structure is the longest arch span in Canada. The total span is 118 feet 6 inches and the length, over all, 178 feet. A constructional view and a brief description were published in our issue of November 2. The Wadsworth Bridge was designed by Messrs. Barber & Young, consulting engineers, Toronto, and the contractor was E. C. Lewis, of Toronto. The opening ceremony was performed by the warden, Mr. A. E. Pugsley. There was a representative attendance, those present including the commissioners, Messrs. R. P. Coulson, S. P. Foote and R. J. Bull, Professor Gillespie, and a number of visitors. After the opening an excellent dinner was served at the Central Hotel, Weston.

J. F. Hewitson, of the firm of Stewart & Hewitson, contractors, Fort William, returned to that city last week after a visit to Toronto, Montreal and Chicago.

Reports to the Temiskaming and Northern Ontario Railway Commission indicate the progress being made in the construction of the National Transcontinental Railway in the vicinity of Cochrane, Ont. On the 205-mile contract held by Mr. J. O'Brien, west of the 100 miles completed by Fauquier Brothers, three and a half miles of steel were laid in two days last week, and the work is being rapidly pushed forward. It is expected that the bridge over the Metagami River will be finished by the end of the month. To the east of the Town of Cochrane the steel is laid three miles east of the Whitefish River, or 86 miles east of Cochrane.

The Norton Griffiths Company, Limited, the well known London, Eng., contractors, have established a branch at Vancouver, B. C., with Mr. W. Burton Stewart in charge as general manager.

Use of Binding Materials in Metalled Roads

Asphalt Oil, mixed with Gravel, Satisfactory and Economical for Ordinary Use—Addition of Asphalt for Heavy Traffic—Specifications and Directions[*]

By Harold Parker, Boston, Mass.

In this paper I shall describe a method that was used in building such a road as, it seemed to me, fulfilled the needs of modern traffic. This road has now been in use for nearly a year and it shows no sign of wear, is perfectly dustless and not unduly slippery.

The old road consisted of macadam constructed in 1900, of local granite, was out of shape, rutted and badly worn by automomile traffic, but with sufficient body to serve as a foundation for a bituminous surface of gravel and oil.

The old macadam surface was loosened by picking up with a steam roller, then shaped by shovels and rolled down with a ten-ton roller, but not tightly bound on top, the old stones being left rather loose to prevent the crawling or waving of the top gravel and oil surface when applied. On this was spread the bituminous mixture of gravel and oil.

This consisted of seven different grades of composition designed to determine as far as might be possible the comparative proportions of gravel, stones, sand and asphaltic oil that would give the best results. Each section, with the exception of the last one, was about 300 feet in length, 15 feed wide and 2 inches thick after rolling.

Section No. 1.—One part of gravel that would pass through a one-half inch and be retained on a one-quarter inch screen and one part of sand that would pass through a one-quarter inch screen was mixed with an asphaltic binder in the proportion of 18 gallons of binder to the cubic yard. The oil consisted of one part of pure asphalt and three parts of asphaltic oil, the oil conforming to the specifications given at the end of this article.

Section No. 2.—The same proportion of sand and gravel as in Section No. 1, mixed with asphaltic oil without the addition of asphalt or oil, was used in the proportion of 18 gallons to the cubic yard of material.

Section No. 3.—Two parts of gravel that would pass through a one-half inch and be retained on a one-quarter inch screen and three parts of sand that would pass through a one-quarter inch screen were mixed with an asphaltic binder in the proportion of 17 gallons of binder to the cubic yard. The binder consisted of 37.5 per cent. pure asphalt and 62.5 per cent. asphaltic oil.

Section No. 4.—The same proportion of sand and gravel as in Section No. 1 with 18 gallons of bituminous binder consisting of 12.5 per cent. pure asphalt and 87.5 per cent. asphaltic oil.

Section No. 5.—One part of gravel that would pass through a one-inch and be retained on a one-quarter inch screen and one part of sand that would pass through a one-quarter inch screen mixed in the proportion of 18 gallons to the cubic yard, with asphaltic oil without the addition of pure asphalt.

Section No 6.—Gravel and sand of the same size and proportion as in Section No. 5 mixed with the same quantity of bituminous binder consisting of 87.5 per cent. asphaltic oil and 12.5 per cent. of pure asphalt.

Section No. 7.—Gravel and sand of the same size and proportion as in Section No. 5 mixed with the same quantity of bituminous binder consisting of 75 per cent. asphaltic oil and 25 per cent. of pure asphalt.

The gravel and sand was taken from a pit near the road, and, as previously shown, was screened first to separate the sand and then to eliminate the larger stones, making two screenings. The gravel contained a fair proportion of stones ranging in size quite regularly from the smallest to the largest described above. The sand was sharp, was composed largely but not entirely of quartz, and was not very clean. There was sufficient very fine sand or sticky earth in it to very nearly fill the finer voids between the particles of the coarse sand. The separation of gravel, stones and sand was made in order to determine the relative proportions of each to be used.

The oil used was in accordance with the following specifications:

Asphaltic Oil.

The oil shall be of uniform color, appearance, general character and viscosity and must fulfill the following requirements:

(a) It shall not froth when heated to 100° C.

(b) It shall have a specific gravity of at least 0.97.

(c) It shall not contain more than 0.5 per cent. of dirt or adventitious mineral matter.

(d) It shall not contain more than 1 per cent. of matter insoluble in carbon bisulphide.

(e) It shall be of such viscosity that 60 c. c. measured at room temperature (78° F. or 26° C.) shall when at 100° C. be not less than 5 minutes nor more than 10 minutes in passing the Lawrence viscosimeter, or 200 c. c. measured and tested at the same temperatures shall be not less than 18 minutes nor more than 36 minutes in passing the Engler viscosimeter.

(f) When 20 grams are heated in a flat bottom dish 3 inches in diameter for twenty-one hours in a well ventilated oven kept at a temperature of 250° C., the loss in weight shall not be greater than 20 per cent.

The asphalt was not a natural asphalt, but was a product obtained by distilling an asphaltic oil conforming to the following specifications:

Oil Asphalt.

The asphalt shall be of uniform color, appearance and character, and shall contain no body not naturally present in an oil asphalt.

(a) It shall not contain more than 1 per cent. of dirt or adventitious mineral matter.

(b) It shall have a specific gravity between 1.02 and 1.10.

(c) It shall contain not more than 1 per cent. of matter insoluble in carbon bisulphide and should not contain more than 30 per cent. insoluble in petroleum ether.

(d) It shall not lose more than 40 per cent. by weight by distilling to 360° C.

(e) When 20 grams are heated in a flat bottom dish 3 inches in diameter for twenty-one hours in an oven kept at a temperature of 100° C. the weight shall remain practically constant.

It developed that the oil should be so free from ammoniacal liquors and lighter oils, and also so free from moisture, that it would not foam in heating. The presence of an ounce of water in a barrel of oil would cause the same to foam and expand to several times its natural volume while heating.

---

[*] Extract from paper presented at Second International Road Congress, Brussels

Preparation of the Surfacing Material.

(a) Oil and Asphalt.—The oil and asphalt were heated separately in kettles from 300° to 400° F., asphalt being generally hotter than the oil, care being taken not to burn by overheating in the kettle. The kettles used for this purpose were of two patterns, both designed by the Massachusetts Highway commission. The one used for heating the oil had a capacity of 300 gallons and the two for heating asphalt a capacity of 125 gallons. All three were on wheels, but they were all kept in the pit where all the heating and mixing were done.

(b) Gravel and Sand.—These were heated separately by means of thin iron smoke stacks laid on the ground, with wood fires. The stacks were about 10 feet long and laid in groups of four, about 18 inches apart and parallel with each other. The screened sand or gravel was thrown over them to a depth of about one foot and after being heated to a temperature approximately 225° F. the stacks with the fire in them were lifted out of the heated gravel or sand, laid down in another place and again covered with the material to be heated.

The mixing of the oil, gravel and sand was done by hand shoveling in wooden or steel mixing platforms, on the wooden first, afterward on the steel. The latter were much better, as they materially reduced the labor. The heated sand and gravel in the above proportions were measured out on the platform by means of a measuring box; hot oil in small quantities, perhaps one-third of the required amount, was thrown over the hot material and turned over once; then the full amount of oil was added and turned, then the full quantity of asphalt was added and thoroughly mixed until practically no sand could be seen that was not thoroughly coated and there were no lumps, and the completed mixture was ready to be shoveled into the carts and hauled to the road. From two to three gangs of mixers were kept working all the time when progress was satisfactory, the idea being that the steam roller, teams and foremen should be given all they could do, thereby increasing the output by working as many low cost units of labor as possible with a minimum of high cost units.

Placing the Road Surface Material.

The temperature of the mixture after reaching the road in the carts was from 150° to 250° F. It was shoveled from the carts into place, or dumped upon a dumping board and shoveled back into place. The best results were obtained when shoveled directly from the cart, perhaps because there was less cooling. One man could do all the spreading. All the coarser stones were carefully raked ahead into the bottom, so as to reduce as far as possible the voids in the surfacing.

The most careful spreading was given and a ten-ton roller followed directly after the material was spread. The surface could not be finally rolled at once, the rolling process being somewhat gradual and completed as the material hardened in cooling. It is probable that if, instead of a regular ten-ton road roller which was not perfectly adapted to the work, a five or six-ton tandem asphalt roller had been used, the rolling would have been cheaper and better.

To obtain perfect results, teaming should be kept off the road for a period which need not be longer than 24 hours after spreading, when the rolling would be completed.

The use of the different percentages of asphalt in the oil and the variations in the character of the gravel in these experiments was for the purpose of determining which of the different experiments served the ends sought most satisfactorily.

The conclusions reached were that all of these trials appear to be successful, that where the traffic is heavy, asphalt should be added proportionately. For ordinary use, however, asphalt oil, as defined in this paper, without the addition of asphalt, mixed thoroughly with gravel composed of particles not larger than would pass through a one-half inch screen, will produce a road that will withstand the wear of automobiles and other traffic in a manner satisfactory and economical.

An Active Winter at Montreal

Construction Work Proceeding Apace—A Forecast for the Spring—Impending Contracts—Plenty of Business Ahead

Montreal, Dec. 23, 1910.

Christmas right on top of us, snow everywhere, the thermometer hovering round the little figures beneath zero, and building and construction work still going on! Three years ago, less perhaps, the first signs of winter meant the practical abandonment of all outside work except snow-shovelling. To-day, what a difference! No matter where one goes in Montreal, work is to be seen progressing almost as rapidly as in the summer. In the north end of the city they are still putting up tenement houses, and although outside work on the Protestant school on Christopher Colombe street is finished, not five hundred yards away, on Lasalle street, foundation work on a new religious institute is just being completed. Further north, in the same district, the city is erecting a pumping station on Laurier avenue, and along Papineau avenue and Gilford street gangs of men are at work laying water and gas pipes.

The erection of the big stores on St. Catherine street is also continuing at full speed. Incidentally, the beautiful terra cotta work which the Wolliscroft people are putting on the Blumenthal building is going to add to the beauty of Montreal's chief shopping street. Farther west, the stone work on Ogilvy's new store is beginning to cover the great steel framework which has looked so neglected all summer.

If rumour is to be believed, next spring will be the busiest in Montreal's history. Preparations are being made for extensive work on all parts of the Island. It was stated to-day on very good authority that Laval University is negotiating for the purchase of a large block of land between Atwater avenue and St. Mark streets on Sherbrooke street for the purpose of erecting a new University. This should be amongst the big things for the spring. The old building on St. Denis street will probably be purchased by the city for a library—at least that is the intention of the men who are handling the matter. Maisonneuve is to have several new factories, two shoe manufacturing firms in Quebec having purchased land for the purpose of removing their factories to this district, while the Dominion oil-cloth people and the Tetreault shoe manufacturing company are also concluding arrangements for erecting large factories there in the spring. Interests behind a new button manufacturing concern have purchased 12,500 feet of land in the town for the purpose of erecting a factory.

Tenders are to be asked this week for restorations and additions to the Quebec custom house about which Mr. Lymburner, superintendent of the Montreal Post Office can give further information, whilst the Dominion Steel Company are considering the extension of their blast furnaces and ovens at Sydney.

The extensions to the A. E. Rea company's departmental store are being opened up, making this building one of the largest of its kind in the Dominion, and it is not improbable that before the end of the spring the Scroggie corner on St. Catherine and Peel streets will be the scene of many transformations.

Canadian's Success in Detroit

Among the many Canadians by birth who have attained distinction in business and politics in the United States, is Mr. Robert Y. Ogg, of Detroit. He has just been elected for the third time to the Michigan House of Representatives from the City of Detroit.

Like a good many men in the limelight to-day, Mr. Ogg graduated from the journalistic ranks. He stated his career as a newsboy on the streets of his native town, Dundas, Ont., learned the printers' trade on the Dundas Standard and Hamilton Spectator, worked as a journeyman printer in many Canadian and American towns and cities, and about a quarter of a century ago located in Detroit, where he became a writer on municipal subjects. Later, he served for five years as Secretary of the Department of Public Works.

Mr. Ogg is now engaged as a manufacturers' agent with offices in the Majestic Building, Detroit, representing the Metropolitan Paving Brick Company, of Canton, Ohio, (manufacturers of Metropolitan paving brick); Republic Creosoting Company of Indianapolis, Ind., (creosoted wood block); Orleans County Quarry Company, Albion, N.Y., (producers of Medina blocks and curbing).

Mr. Robert Y. Ogg, Detroit

Mr. Ogg's popularity is shown by the fact that he had a majority of over 15,000 in the recent election. He is a staunch American, but always has a warm spot in his heart for Canada, where he has a wide acquaintance especially among town and city engineers and municipal authorities.

An Interesting Announcement

One of the largest exhibits at the 1911 Toronto Exhibition is to come from, Bristol, England, representing the trade and general commerce of Bristol and the West of England.

This information, which has not yet been sent to the Exhibition authorities has just been received from the English city by a Montreal gentleman whose correspondent states that a committee of manufacturers is being organized by Mr. Henry L. Riserley, of Cecil Road, Clifton, Bristol, to take charge of the exhibit.

"We want to show Canada," the letter runs, "that Bristol manufacturers are alive to the possibilities of trade with the Dominion, and we intend doing our best to make our section the finest and most talked about in the Exhibition."

It will be remembered that last summer a large deputation of Bristol manufacturers and merchants visited Canada, and after a tour through to the coast expressed themselves as amazed and gratified with the progress being made. They regretted that so much trade was going to other countries outside the British Empire and determined to do what they could to capture as much as possible for themselves. Since then many of them have sent travellers to Canada and established agencies here whilst equiries are now being made in various parts of the Dominion relative to sites for warehouses and factories. By next summer it is possible that several factories will be in course of construction by these energetic West of England men, and as the products of Bristol and vicinity extend right through the alphabet from acetylene apparatus to zinc manufactures, the visit should be productive of much good both to Canada and Bristol.

Personal News and Notes

Building permits issued at Calgary during 1910 total approximately $6,000,000.

Mr. J. W. Stewart, of Foley, Welsh & Stewart, the well known railway contractors, sailed last week for Scotland.

The death occurred last week at Victoria, B. C., of Mr. Theodore Luble, one of the pioneer civil engineers of the province.

Mr. J. W. Wilson, the well known architect of Chatham, Ont., is appealing to the electors of that city for a position on the aldermanic board of 1911.

Mr. G. H. Broughton, civil engineer and surveyor, has opened an office in the Princess Theatre Block at Regina, Sask.

A report from Nelson, B.C., states that the C. P. R. will build a branch from below Elko in the Kootenay to the undeveloped coal fields at Waldo.

$400,000 will be expended in present construction on the Royal Ontario Museum now being erected on the University property on Bloor St., Toronto.

City Engineer Rust, Toronto, returned recently from a trip to a number of large American cities, which he visited for the purpose of getting information for his report on a steam heating franchise for Rosedale.

Building permits issued at Vancouver last month totalled $1,897,585, compared with $610,189 for November, 1909. The total permits issued for 1910 to date are $12,196,740. For the whole of 1909 the returns were $7,258,565.

George A. Fuller & Company, of New York, the well known building and engineering contractors, have taken a temporary office in the Jacobs Building, Montreal. They are having permanent offices specially fitted up for them in the same building.

At a recent meeting of the Vancouver branch of the Canadian Society of Civil Engineers, presided over by Mr. Geo. Webster, Mr. Wm. Dart gave an address on the Testing of Concrete Pipe, and Mr. F. P. Wilson read a paper on Railway Organization and Cost Keeping. Messrs. Dart and Wilson are both resident engineers of the C.P.R.

Mr. E. H. Lea, a member of a Dominion Government survey party engaged in locating the Canadian-Alaska boundary line, had a remarkable escape while prosecuting his work. He was crossing a snow covered track when he suddenly fell down a crevasse 4,000 feet deep. Sixty-five feet from the surface he was wedged between two icy walls. Finally he was rescued by his companions. He has been laid up for two months by injuries, consisting principally of broken ribs and dislocations.

The annual convention of the Canadian Cement and Concrete Association will be held at the St. Lawrence Arena, Toronto, March 6-11, inclusive. Owing to pressure of aca-

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"The durability of a building is the gauge of its value from an economic standpoint."

—The Philosopher of Metal Town

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality COLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

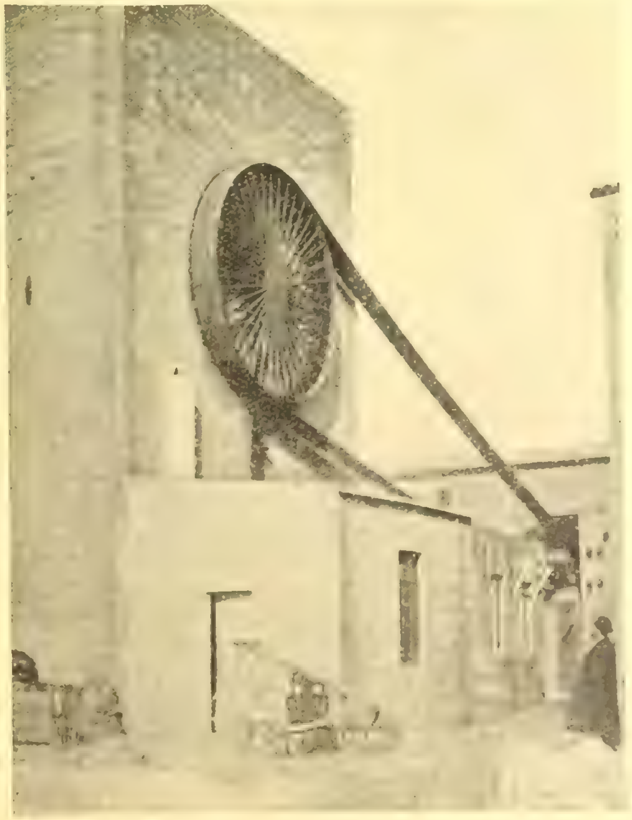
Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1955

The Metallic Roofing Co Limited
TORONTO & WINNIPEG



You can run

Scandinavia Belting

You can run **Scandinavia** Belting **Outdoors or Indoors**

There are no plies to come apart.

Let us know your belting requirements, and we will supply you with a belt suitable to your needs.

Scandinavia Belting for Transmission or Conveying

Federal Engineering & Supplies Ltd.
284 Yonge Street
TORONTO

Agencies
Montreal, Power Economies Ltd
Ottawa, McDougall's Limited
Calgary, Great West Saddlery Co.
Cobalt, Geo. Taylor Hardware Co.
Pt. Arthur, The Marks-Clavet-Dobie Ltd.

Agents Wanted in Other Cities.

demical work and other duties, Mr. R. E. W. Hagarty has resigned his position as secretary-treasurer of the Association. Mr. William Snaith, of 57 Adelaide St. East, Toronto, has been appointed in Mr. Hagarty's stead.

The addition to the boiler shops of the J. I. Case Threshing Machine Company, Incorporated, Racine, Wisconsin, is just being completed. This is a building, 6 ft. by 215 ft., which will be used exclusively for a stock room for the Case boiler shops. A boiler storage has been completed 230 ft. by 60 ft. This is equipped with a travelling crane for movement of boilers from one part of the building to another. Under the supervision of the Case architect the above work has been undertaken and completed, also the remodelling of the Garfield warehouse, which is 100 ft. by 250 ft. and two stories high. This building, when the remodelling is completed, will be used as a machine shop. Machine shop facilities have not been adequate. As soon as the weather will permit, other buildings will be put under construction. The heavy business for the present year has necessitated all these changes.

Publications Received

Escher Wyss & Co., Zurich and Ravensburg, have favored us with a number of their most recent catalogues of water turbines, Zoelly turbo-compressors and Zoelly marine turbines. This firm has a world-wide reputation for these supplies. The total number of water turbines of all kinds built by Escher Wyss & Co. to the end of June, 1910, was 4,664, with a total output of 1,642,000 h.p.

We are indebted to the St. Bride's Press, Ltd., London, Eng., (proprietors of "The Surveyor") for a copy of "Practical Road Engineering," by H. Percy Boulnois, M. Inst. C.E., (140 pages and introduction; illustrations; price 5s. net). This book is compiled from the special "Roads" issues of The Surveyor and Municipal and County Engineer, and is unique in the respect that it is written by many authors, all of whom are well known experts on road questions. It deals exhaustively with a great variety of subjects and cannot fail to be of interest to all interested in good roads. The book is a veritable encyclopedia of the most approved English practice.

We are indebted to Messrs. Chas C. Thompson Company, publishers, Chicago, for a copy of "Dustman's Book of Plans and Building Construction." This book is designed for general contractors and builders and for prospective home builders. It contains, in addition to the plans for 150 modern houses, bungalows, barns, etc., a wealth of constructional information that should prove of the greatest value. The author, Mr. U. M. Dustman, is widely known as a practically expert architect, and as an authority on building construction. The contents include: General Construction Plans—Plans with Estimated Cost of 150 Houses, Bungalows, etc., in Frame, Concrete or Brick Construction—How to Estimate Costs—Store Fronts—Roof Construction—Directions for Concrete—Itemized Lists of Material Costs. The Book is well arranged and durably bound in green cloth. Price, $2.00.

"Traité théorique et pratique de la Résistance Des Matériaux appliquée Au Béton et Au Ciment Armé," by N. de Tédesco and A. Maurel (second edition). 1 volume in-8°, 656 pages and 199 illustration. Published by Béranger, Paris, 1910. Bound in red cloth, 25 francs.

The authors of this important work have written it with the idea of publishing all that is actually known on the subject of reinforced concrete. Book I reviews the physical, chemical and mechanical properties of Portland cement, and of cement mortars and concretes. It also contains a synopsis of the methods for calculating works in non-reinforced concrete. Book II. treats of the principal methods of calculus which have been proposed, among which is that of M. Considere, followed by interesting extracts of official regulations of different countries. In Book III., the authors give a first essay on the calculus of reinforced cement under compression, extension, shearing and oblique efforts; the general theory of the calculus of deformation is next treated. In Book IV., we find the results of application of the formulae obtained in the preceding book, in varied cases of pieces submitted to flexure, slabs, girders, elements of ribbed floors, etc., in which the different parameters are made to vary, such as the percentage of reinforcing material or the safety coefficient. These examples enable the reader to grasp the method completely, and have the advantage of showing the influence of different variable parameters. The last chapters are devoted to a general discussion on the variations of the parameters, to an explanation of Considere's system of hooped concrete and Pendaries system of reinforced metal. An appendix gives the results of a certain number of reasoned strength tests. The whole volume is altogether a useful and practical guide to all interested in reinforced concrete.

Trade Enquiries

The Dominion Goverment Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope, and stating number of enquiry:

1900. Agents.—An English firm manufacturing stone-breaking machinery, concrete block machines and concrete mixers, screens, elevators and conveyers, etc., is open to appoint reliable Canadian agents.

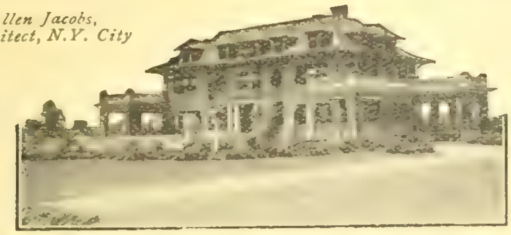
1909. Agents.—An English firm manufacturing plaster of Paris, Keene's and Parian cements, and other gypsum products, is desirous of entering the Canadian market, and of appointing first-class representatives.

1913. Prepared clay, glazes, silicates of lead, etc, etc.—A Staffordshire firm manufacturing prepared clay, glazes, silicates of lead, oxide of cobalt, borax, white lead, potters' chemicals, metal enamelling, etc., asks to be placed in touch with earthenware manufacturers in Canada open to purchase supplies. They can also supply machinery for the pottery and enamelled iron industries.

The annual banquet of the Engineering Society of Queen's University was held at Kingston, Ont., on Dec. 20th. Those present included Lieutenant-Governor Gibson, Toronto; T. W. Gibson, Deputy Minister of Mines, Toronto; A. B. Wilmot, M.A., professor of mining and geology, Toronto; Mortimer Lamb, Secretary of the Canadian Mining Institute; J. G. G. Kerry, consulting electrical engineer, Toronto; H. E. T. Haultain, professor of mining engineering, Toronto University; P. W. Sothman, chief engineer of the Hydro-electric Commission, Toronto; J. W. Kynoch, chief engineer of the Canadian General Electric Company, Peterboro; J. W. Weller, chief engineer of the Welland Canal; R. W. Leonard, President of the Coniagas mine, Cobalt; A. W. Campbell, Deputy Minister of Railways and Canals, Ottawa.

At a meeting of the Trades and Labor Council last week a report was submitted by a special committee, in which it was recommended that a deputation be sent to the Board of Control, asking that body to apply to the Legislature for power to cancel any contract for public works upon which the contractor failed to comply with union conditions.

Harry Allen Jacobs,
Architect, N.Y. City



Stained with CABOT'S SHINGLE STAINS

The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood-preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

SAMUEL CABOT, Inc., Sole Mnfrs, Boston, Mass., U. S. A.

CANADIAN AGENTS
Seymour & Co., Montreal
A. Muirhead Co., Toronto
W. H. Thorne & Co., St. John
Henry Darling, Vancouver
Dunn Bros., Winnipeg

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

JAMES BRODIE & CO.

Quarriers and Manufacturers of

Canadian Quinsy, Ebony and Stanstead Granite

Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty

IBERVILLE, QUE.

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Offices:
Nos. 346 and 348 Broadway, NEW YORK CITY U.S.A

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont., London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS C. IRVING,
Gen. Man. Western C nada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis,
(Taylor & Gordon,

Architects

North British & Mercantile Chambers,
80 St. Francois Xavier St., Montreal
Telephone Main 281.

Tenders

For Roofing and Sheet Metal Work

in all parts of Canada

Communicate with

A. Schwoerer & Sons, Inc.

530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

Robert W. Hunt & Co. **Engineers**

Bureau of Inspection Tests and Consultation

Dominion Bureau, Canadian Express Building, MONTREAL

Inspection and Tests of Steel, Iron and Cement
Resident Inspectors through Canada

Chicago New York London Pittsburg San Francisco St Louis

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Office:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	Western Union Building
Mexico City, Mex.	Edificio de "La Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Special Mantles
Stair Cases
Panelling
Veneered Doors
Glass Partitions
Bank Fittings
Office Fittings
House Fittings

: OUR WESTERN AGENTS :

E. V. Alburty,
Dominion Trust Bldg
Vaucouver, B.C.

J. Malcolm-Suttie,
Travellers Building.
Winnipeg, Man.

Saskatoon Forwarding & Storage Co.
Saskatoon,
Saskatchewan

Walker & Barnes
Edmonton,
Alberta

Lickley's Ltd.

Mail Building

Phone Main 3166 TORONTO

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 TORONTO

Branches : Vancouver and Winnipeg
Montreal

The

Phœnix Bridge & Iron Works Limited

MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

SCHAW QUARRY

CRUSHED STONE ALL SIZES

Rubble and Cut Stone, Lime, Sewer
Pipe, Fire Brick, and Common Brick

JOHN MALONEY Queen and Dufferin Sts., TORONTO

Office Phone P. 64 Residence P. [illegible]

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company

Renfrew, Ont.

White Lime, Stone, Grey Lime, Brick, Drain Tile.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance, No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF
GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS
We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners
Contractors

USE

Hard Wall Plaster

instead of lime for plastering
Walls and Ceilings
and get your building
One Month Earlier

H. W. Calkins
Manufacturer

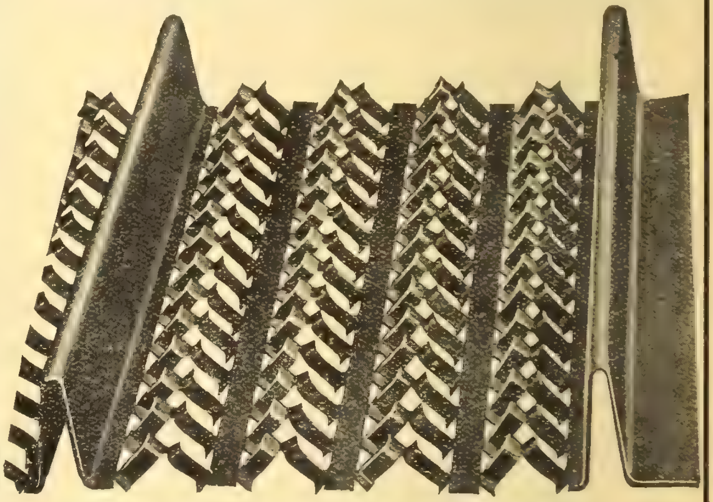
Works
Keele St. & Weston Rd.
West Toronto

Office and Warehouse
Yonge St. & C.P.Ry.
North Toronto

Write for booklet

KAHN SYSTEM
Products include
HY-RIB

Combination of metal lath and channel in one sheet. Does away with expensive wiring and studding, also Form work when used as reinforcement for floor or roof slab.



Trussed Concrete Steel Co.
of Canada, Limited

Head Office: Walkerville
Branches: Toronto, Winnipeg, Montreal, Vancouver,
Agencies: Quebec, Halifax.

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers
Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter
for Water, Gas, Culvert and Sewer
HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridges' Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures of Every Description. Tel. Long Dist. Uptown 751.

405 Dorchester Street West, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising
Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and
Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 26-27, Flack Block, Vancouver, B. C.

JAMES TAYLOR Consulting and Inspecting Engineer.

P.O. Box 95, Station B., Montreal, Canada

Conveying, Elevating, Screening and Transmission Machinery. Brass and Iron Castings and General Mechanical Work contracted for. Second Hand Machinery Inspected for Purchasers. Design of Reinforced Concrete Barges, Scows and Pontoons a specialty. :: ::

The John Galt Engineering Co.

Consulting, Civil and
Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in
all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone
crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite
Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on
Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave.
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock bricks	10.00
Wire cut bricks for foundation work.. $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50

Brass Goods, Valves, etc.

96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 65 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 80 per cent. off; lead waste, 80 per cent. off; caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.56
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.
7 and 8-inch pipe, 50 per cent.
Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.65.
Cement, car lots, f.o.b. Toronto, bags extra, $1.70
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble stone delivered, $14 to $15 per toise.
Free stone delivered, 14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents.
Plaster of Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

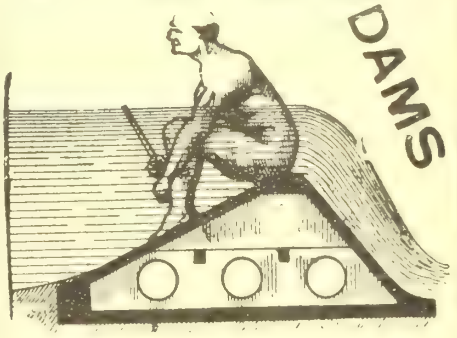
Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.00 to $9.50 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Boiled Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, $1.05 per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

E. Cauchon & Cie., contractors, Quebec, have registered.

The B. C. Gazette gives notice of the incorporation of the following companies: Columbia Paper Company, Limited, capital, $75,000; Columbia Valley Timber Company, Limited, capital $100,000; Revelstoke Building & Contract Company, Limited, capital, $100,000; Prince Rupert Building & Investment Company, Limited, capital, $[illegible],000; Fort George Timber & Transportation Company, Limited, capital, $200,000; Crown Timber & Trading Company, Limited.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
OFFICE AND WORKS
Phone M 2341. 63 Esplanade, E. TORONTO

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL, P.Q.

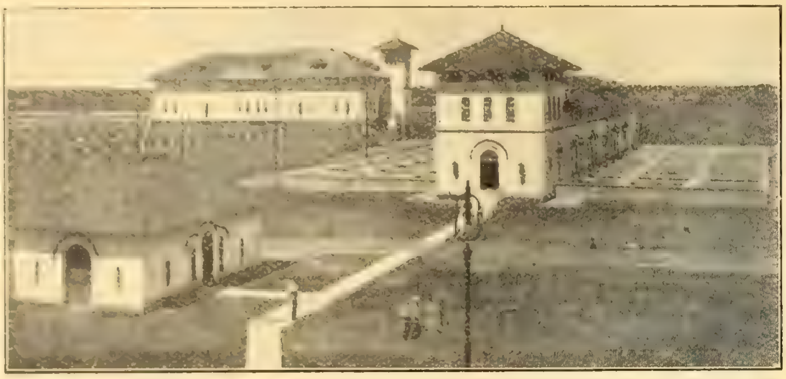
Contractors
Columns,
Beam Rests,
Beam Hangers,
Iron Sills,
Sashweights.

The Katie Foundry,
Galt, Ont.

Municipal
Water Pipe,
Service Boxes,
Manhole Frames,
Crossing Plates,
Special Castings.

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given



Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co. Limited
Woodstock, Ont.

MILL WORK

Sash, Doors, Frames, Stair and Veranda Material to Detail

S. Anglin & Company
Kingston, Ontario

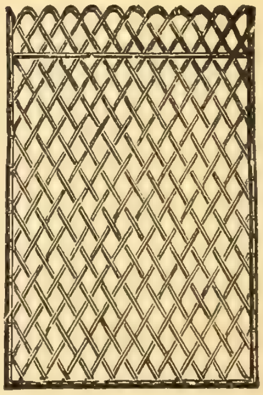
"The best is cheapest"

"Sanorto"

Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.



Protect Your Windows

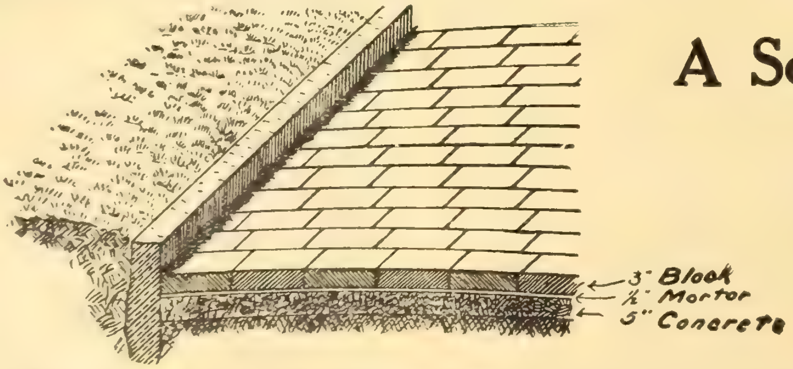
from all danger of accidental breakage by using

Greening's Wire Guards

We can supply you promptly with any size or shape in any quantity you may desire. Our prices are very close. Get our quotations. These guards will soon pay for themselves in lessened window-repair bills.

Catalog No. 4 Sent Free on Request

The B. Greening Wire Co., Limited
Hamilton, Ont. Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

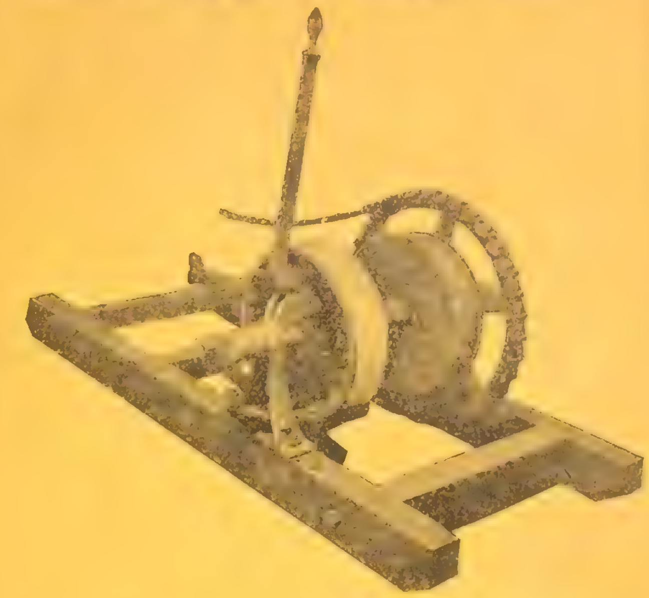
Write to

Siemon Bros., Limited

Wiarton, Ont., Canada

309-10-11 Confederation Life Building, TORONTO

DO YOU WANT A GOOD HOIST ?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

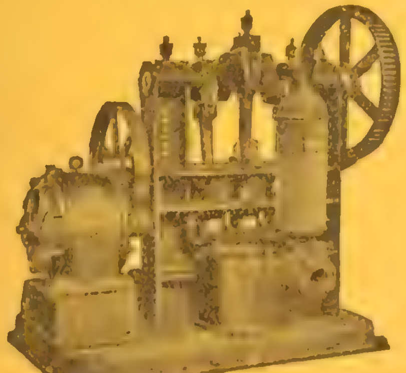
The London Gas Power Co., Limited
Engineers and Machinists **London, Canada**

Goulds

Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**

Phone Main 1054

Works: Seneca Falls, N.Y.

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

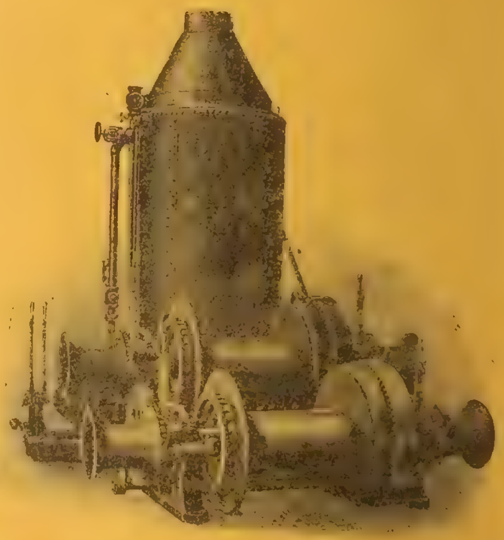
Georgian Bay Shook Mills
Limited
Midland, Ontario

"Some Equipment With Merit"

FOR THE CONTRACTOR

Hoisting Engines

of all sizes



For
Contractors
Quarrymen
Bridge Builders

Railroad, Dock and Sewer Construction; Dredging, Hauling Erecting and Driving; Ships, Mines, Docks, etc., etc.

ELECTRIC HOISTS BELT HOISTS

"Ransome" Concrete Mixers

in all sizes — all styles of power
"The best mixer to be obtained"

We are now offering a No. 4 Ransome, suitable for all classes of small work.

It will pay you to investigate

F. H. Hopkins & Co.

Successors Late James Cooper
MONTREAL

Ritchie Contractors Supply Co., Quebec　Dunn Bros., Winnipeg　Ritchie Contractors Supply Co., Vancouver